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Sea Scallop Enhancement

and

Sustainable Harvesting

The Seastead Project

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II. Abstract

The Seastead Project has been a three year effort to demonstrate sea scallop, *Placopecten magellanicus*, resource enhancement off the coast of Massachusetts. The objective of this project was to enhance sea scallop production using the existing Massachusetts fishing industry base by developing a)means to transport scallops live, b) methods to grow-out transplanted scallops on the bottom and in the water column, c) criteria for managing scallop grow-out areas, and d)means to identify potential grow-out areas. The emphasis was to develop and demonstrate the technology to enhance sea scallop production, on a sustainable and environmentally sound basis, using the existing New England fishing industry and infrastructure.

III. Executive Summary

Seastead is a collaboration between scientists and the sea scallop fishing industry to examine potential scallop enhancement/production strategies. After 30 months of effort all required permits had been secured for the first aquaculture research area in U.S. federal waters. The twenty-four square-kilometer area is located 15 kilometers south of Martha's Vineyard, Massachusetts, USA, and is now closed to mobile gear and dedicated to researching culture and enhancement strategies. The site, with average depths of about 30 meters, has been marked by large lighted yellow buoys. The site is in an open ocean location subject to large waves and strong currents.

The site has been stocked with wild-caught scallops. Approximately 40,000 scallops, ranging in shell height from 40-100 mm, were placed in bottom cages, suspended nets, and loose on the bottom in 1997. The scallops were monitored for growth and mortality. In 1998, an additional 80,000 scallops, ranging in shell height from 50-140 mm, were direct seeded on the bottom. The scallops seeded on the bottom were monitored using an underwater video camera sled. The scallops in the cages were hauled and measured. Sub-samples of all groups of scallops were evaluated for health and condition at times during the project. Data was collected to allow for an economic analysis of the culture strategies.

The biggest obstacles the project has overcome, and with great success, were regulatory and social. The project was in part responsible for (a) the formation of the Sea Scallop Working Group in Massachusetts, (b) the formation of an Aquaculture Committee within the New England Fishery Management Council, (c) developing scallop industry awareness of enhancement/area management strategies, and (d) establishing the first working aquaculture site in federal waters.

The project results indicate that bottom seeding of scallops into grow-out areas is a very viable option for managing scallop production.

IV. Purpose

A. Identification of problem

The New England fishing industry is facing hard times. The fish and shellfish resources the industry depends upon are seriously depleted. Proposed conservation measures will restrict catches at levels that will put many fishermen out of business and any remaining fishermen will be operating at lower levels of production. The ripple effects on the economy, including processors and suppliers, will be devastating. The value of the sea scallop industry to Southeastern Massachusetts easily exceeds half a billion dollars annually in good years. This could all be lost quite suddenly.

The decline of the scallop resource has been blamed on overfishing, usually thought of in terms of harvest removals. However, there are other fishing impacts that play significant roles. Frequent towing over the bottom impacts the productivity of the scallops and other species in ways we don't understand clearly. There is non-catch mortality to scallops caused by the dredge while on the bottom (ie, mechanical damage, sediment suspension effects, etc). There is the loss of value and spawning potential by harvesting small scallops. Existing management options can only address these problems by decreasing fishing effort which will reduce employment and most likely lead to the consolidation of the industry in the hands of a few. A much better approach would be to expand the resource base.

There are possible alternative opportunities for the men and infrastructure that compose the fishing industry of southeastern Massachusetts. One of the most promising is sea scallop (*Placopecten magellanicus*) aquaculture and resource enhancement. Many of the prerequisites for success exist. There is a large supply of small scallops, the infrastructure is in place, the unit value is high, and the market is established. Most importantly, the scallops can be reared on naturally occurring feed. The potential is vast, however, much will need to be accomplished to make sea scallop resource enhancement and aquaculture a reality in this geographic area. In the interim, there needs to be a logical progression from today's wild capture fishery to one of husbandry.

This project reviewed the current status worldwide of scallop aquaculture and examined the possible approaches that can be used in southeastern Massachusetts to raise sea scallops for market. Problem areas were identified and the approach to solve these problems were enumerated. What follows is a summary of what the review uncovered.

Scallop Culture

Background

Scallop culture, as practiced today, was pioneered in the Mutsu Bay region of Japan (Aoyama, 1989). The scallop fishery in that area was subject to significant fluctuations in abundance; a factor common to most scallop fisheries including sea scallops. In 1935, Japanese researchers started on a program to overcome the fluctuations in scallop abundance. The early scientific efforts concentrated on ways to collect scallop spat; the stage in the scallop's life, after the planktonic phase, when it settles to the bottom.

By 1953, local fisheries cooperatives were collecting spat to re-seed fishing grounds. In 1955, they started to hold the spat for short periods of time before re-seeding in order to increase scallop survival. In 1964 a breakthrough occurred in spat collector design that significantly increased the number of spat collected. The increase in spat availability lead to improved methods to hold large numbers of scallops in captivity until fully grown (Ito and Byakuno, 1989). Today seventy percent of Japan's scallop harvest is cultured. The harvest is stable from year to year and is an order of magnitude larger than the previous wild harvest fishery. There are over 1900 scallop harvesting firms in the Mutsu Bay region alone and many other regions also produce cultured scallops.

Since the 1970's, countries in all parts of the world have begun scallop culture operations based on the Japanese model (Kirk, 1979; Paul et al., 1981; Reyes, 1986; Naidu and Cahill, 1986). Some depend on collecting spat, others use hatcheries to produce the spat. Canada has been working on culturing the sea scallop and is on the verge of successfully starting an industry based on culturing. While the world moves forward creating jobs and wealth through aquaculture and resource enhancement, the United States finds itself importing cultured scallops.

Culturing

Scallop culture operations depend on obtaining a large supply of spat, commonly called seed. Two sources of seed are hatcheries and spat collecting devices. Hatcheries usually collect sexually mature scallops from the wild population and spawn them in captivity. Scallops are easily induced to spawn by raising the water temperature (Gruffydd and Beaumont, 1972; Costello et al., 1973; Ito et al., 1975). There are variations in the rearing techniques, and different levels of difficulty, depending on the species of scallop. The Canadians are successfully spawning sea scallops in hatcheries and rearing them through the spat stage (Naidu et al., 1990).

The Japanese, however, have found that hatcheries are expensive to operate when compared to wild spat collection. Their culturing system depends on setting out spat collectors. The spat collectors consist of submerged longlines to which onion bags, stuffed with monofilament netting, are attached. The small swimming scallop larvae pass through the mesh of

the onion bag and attach to the monofilament netting. After a month or two they detach but are now too large to pass through the onion bag mesh so they collect inside the bag.

Success of spat collection depends on locating the collectors at the right time and place. The Japanese have developed an efficient system for timing collector placement utilizing plankton surveys, oceanographic buoys, gonadal indices, and the blossoming of cherry trees (Ozaki et al., 1991). They usually harvest significantly more spat then they can utilize. An interesting consequence is that they select the largest spat, which are the fastest growing, for the culturing operations. There is some indication that this selective process has shortened the time needed to culture the scallops to market size (Ito and Byakuno, 1989). The Canadians have tested spat collectors but have not yet attained the large catches as seen in the Japanese fishery (Naidu and Scaplin, 1979).

Intermediate culture

Scallop spat usually range in size from a few millimeters to about 15 mm depending on the species and holding time. This size scallop, if placed on the bottom, suffer high mortality. Therefore most culture operations hold the scallops, in an intermediate culture phase, until the scallops are about 20-30 mm in size. The most common method of holding utilizes strings of specially designed pearl nets attached to arrays of submerged longlines. Holding the scallops in these nets, up off the bottom, reduces predation and provides better feeding conditions enhancing growth. The Canadians have held sea scallops for one year in the intermediate phase with success (Naidu et al., 1990). Occasionally cleaning of the nets is required during this period.

On the west coast of South America a culturing system was utilized that bypassed the spat collection and intermediate holding phases. Divers harvested scallops of intermediate size and brought them into shallow water where the scallops were held in corrals until grown to market size (Costello, 1985). This method has now been replaced with hatchery reared seed stock.

Final culture

Final culture, or grow-out, can be conducted in a number of ways. Two general categories are cage culture and bottom culture (sea ranching). The most common form of cage culture utilizes a specially designed lantern net; a cylindrical cage of netting with about ten compartments stacked one on top of another. A specific quantity of scallops are placed in each compartment and the nets then placed on longline arrays. After a period of time, about one year, the scallops are thinned and usually placed into a larger mesh lantern net. There are many variations to this theme such as a scallop house (or pocket net) where each scallop has its own individual compartment (Dix, 1981). Other hanging culture methods include ear hanging where the scallop is tied to a string by means of a hole drilled in the hinge, or ear, of the shell. A third method involves gluing scallops to a hanging rope (Cropp, 1985). Obviously, these methods are very labor intensive.

The least expensive method of grow-out seems to be bottom culture (Frishman et al., 1980). Bottom culture does not require expensive nets or labor. The scallops are released onto appropriate bottom to grow to market size and, in some cases, the bottom has been cleared of predators such as crabs and starfish. Upon reaching market size the scallops are harvested by dredges or divers. Appropriate bottom is defined both by ecology and legal/regulatory constraints. The bottom needs to be suitable for scallop growth and have minimal amounts of predators. The bottom should not be in conflict with other users. The bottom can be leased to individual operators who would own the scallops they seed. Another approach, commonly called resource enhancement, involves government supported seeding of common grounds.

Canadian efforts

It is most appropriate to review what is publicly available on the Canadian efforts to raise sea scallops on the east coast. Canadian efforts on sea scallop culture began in Newfoundland in 1971 with the invitation of two Japanese experts to set up an experimental operation. Work also began at this time, at the Memorial University of Newfoundland, to produce seed scallops in the laboratory. In 1975, the Canadian government's Department of Fisheries and Oceans became actively involved in attempts at sea scallop culture, testing various techniques of spat collection and the impact on growth. By 1986, investigators succeeded in rearing scallop larvae in the laboratory through metamorphosis. There is evidence that some of the scallops caught in Newfoundland are from stock enhancement efforts (Naidu et al., 1990).

Large scale production of spat is underway at the Magdalen Islands Experimental Hatchery in Quebec, at the Marine Sciences Research Laboratory in Newfoundland, and at the Aquaculture Research Station in Halifax. One hundred thousand 1.0 mm seed scallops have been produced and transferred to the open sea for growth trials in Quebec. Scallops can reach spat stage in the laboratory in five weeks at 15 degrees C. Scallops do well in 5-15 degrees C but succumb to temperatures above 21 degrees C.

In one Canadian operation, at the end of the intermediate grow-out phase, the two year old scallops were placed into lantern nets. Survival in the lantern nets was estimated to be between 60-75 percent in years three, four, and five. Cages can be cleaned during grow-out with high pressure hoses. In Newfoundland, commercial size scallops have been grown in four years in cage culture vs six years in the wild. Ear hanging has been tried but there are problems with fouling. Bottom culture is less expensive than other methods and the scallops reach commercial size within 3-4 years of transplanting.

The Canadians have found that the choice of a suitable site, for each phase of the aquaculture operation, is critical for success. Limiting factors include disease, toxins, water temperature, and predation.

Southeastern Massachusetts

This project had a limited geographic range, limited time, and a single species focus, *Placopecten magellanicus*. The work that was accomplished will certainly have wide ranging application into other geographic areas and species. However, successful scallop culture is site specific and thus there is a need to focus the research and development effort.

The fishing infrastructure that may most directly benefit from this project includes primarily the New Bedford scallop fleet and the coastal fishing fleets from Cape Cod north to Scituate. The project focused on the technology needed to culture scallops away from the crowded, and possibly polluted, coastal zone. One of the key design considerations was to use the existing scallop industry infrastructure; personnel, vessels, and ports. The scallops that were to be used for stocking are those that are normally taken as bycatch in the commercial scallop fishery; ie, often culled back overboard (40-60 mm shell height). However, ring size changes in the fishery eliminated this source of seed. Consequently, the project relied on directed seed harvest. The project also examined how to hold and transport these scallops live to the Seastead test site.

Problem areas

Project personnel conducted an extensive literature search in order to identify potential problem areas in shifting from a wild capture to a husbandry based scallop fishery. The following is a brief synopsis of what were the major anticipated problems in addition to those of biology and engineering associated with rearing scallops.

1. Site Selection

This project planned to compare two types of grow-out technology; off-bottom culture (arrays) and bottom culture (lanes). The first problem was to determine where to locate the test site. Since the highest priority of this project was to test equipment and procedures in a relatively exposed location the site location task was not overly difficult. A site was needed where a specially designed lantern net array could be moored and then compare its operation to scallops placed nearby on the sea bottom. A site was chosen that was relatively close to New Bedford (fishing), Marthas Vineyard (hatchery), and Woods Hole (science) but still exposed. Fishermen were surveyed to find a place free of most fishing activities. From our combined experience we know the area is not heavily traversed by surface traffic. Bottom water temperature data was checked to confirm that the location did not exceed 18 degrees C in the peak summer months. Finally, scallops have been in the area in the past and are present more often in the heavily used areas to the east and west of the proposed site. However, in the future, sites will need to be chosen to maximize scallop growth and survival and this will require extensive experimentation and user interactions.

2. Seed source

Ultimately, efforts will need to be made to locate the best sites for spat collectors to determine if this methodology is appropriate for Southern New England. Currently, plankton sampling performed by the National Marine Fisheries Service (NMFS) does not separate out sea scallop larvae from other bivalve larvae. There also is no routine examination of sea scallop gonad condition. Spat collection was not a major aspect of this proposal, but its potential can not be ignored. Basically, the existing research capabilities of NMFS and others would need to be reoriented or augmented to support scallop culture activities. There is reason to believe that high concentrations of scallop spat are seasonally present in the area (Merrill, 1965; Merrill and Edwards, 1976). Spat collectors were to be set out at the project test site in the appropriate seasons to confirm the presence of scallop spat and other co-spawner activity however this activity did not take place due to problems in a related project. We were also planning to work closely with the Marthas Vineyard Shellfish Group on their attempts to produce seed scallops, but their project was completed before we received our permits.

For the purposes of this project we decided to take the approach of using wild caught intermediate size scallops (40-60 mm) or larger depending on availability. This approach was used in Japan and Peru when these countries first started their scallop culture industries. Research has shown that scallops above 30 mm in shell height have a much higher chance of survival in bottom culture operations. In effect, this project bypassed the seed problem in order to test water column culture vs bottom grow-out technology.

3. Legal

The project needed to address legal problems associated with setting up a system that would allow a degree of exclusivity to a scallop grow out site. Much has been written about these problems, but little had been done to provide workable solutions needed to support the technologies presented by this project. One approach would be to have the government, both at the state and federal level, identify aquaculture zones in which simplified leasing arrangements can exist. A major part of this project proposal was to propose model law to set up such zones and to issue experimental leases. However, the granting authority (NMFS) decided this was not an appropriate activity for federal funds. Our efforts in this area were funded by the participants.

Competing uses and environmental parameters needed to be addressed from the legal/regulatory standpoint to get the project underway. This resulted in the development of an Scallop Fishery Management Plan (FMP) Amendment by the project team. In Japan, fishery rights are given to fisheries cooperatives to conduct aquaculture operations in designated areas (Ozaki et al., 1991). Our project was to test this concept by having eight commercial scallop companies share the test site defined in the Amendment. The difficulties in getting permits from NMFS limited this activity. A lengthy discussion of the legal/regulatory aspects of this project will be presented in this report because of the importance to future aquaculture and enhancement efforts..

4. Oceanography

There is very little information available about the oceanographic conditions in potential culture areas. The Massachusetts Division of Marine Fisheries has some bottom water temperature monitoring stations in state waters, designed primarily with the lobster fishery in mind, that could be expanded to support scallop culture operations. There are other sources of data that need to be examined. After examining what is available, this project may propose a real-time network of oceanographic monitoring stations. Such information would benefit not only this enhancement/culture project, but also other activities.

B. Objectives of the project

1. Provide alternative economic opportunities for the New Bedford scallop industry.

The New Bedford scallop fleet is currently overcapitalized - too many boats fishing too depleted a resource. This project planned to demonstrate alternative usage for scallop vessels as tenders in open-ocean grow-out activities. The project also planned to work towards methodology to expand the resource base which in turn should support a larger industry.

2. Develop techniques for the optimal management of a scallop grow-out area

This project planned to develop and demonstrate new, alternative techniques for improving scallop utilization. Today's practice of repeatedly dredging an individual scallop until it is large enough to shuck is both inefficient and wasteful. Their growth cycle is disturbed, they are smothered in sediments, and dredge and handling-induced mortality may take a high toll. Controlled harvesting in seeded areas, where most scallops are of known and near uniform size, minimizes the above effects. In this project's approach, scallops would be harvested once prior to seeding and once to keep. This reduction in dredging effort on individual scallops and over these controlled-fishing sites is the key to improved growth, better survival, and the restoration of the scallop resource.

3. Develop techniques for the capture, holding, transportation, and seeding of small scallops.

Essential to the previous goal is the development of methods to hold, transport, and seed undersized scallops. Scallops need circulating, oxygen-rich water and thermal stress must be avoided. This project planned to demonstrate cost-effective systems for holding live scallops and ways to effectively seed a grow-out site.

4. Propose a legal/regulatory regime (model law) for scallop operations.

   The development of commercial-scale culture and grow-out operations is discouraged in this region due to a complicated regulatory framework and unclear policies. This project planned to explore the problem and identify changes or new legislation that would foster beneficial growth in near-shore and off-shore waters.

5. Identify potential scallop grow-out sites in New England.

   Scallops, like other filter feeders, are attractive to culture due to the lack of an artificial feeding requirement. In both suspended and on-bottom situations scallops offer excellent potential to commercial growers. They are, however, sensitive to temperature and nutrient availability and siting of grow-out activities will be critical to the success of a venture. The project planned to explore the region for potential grow-out locations based on environmental conditions, conflicting use, and local regulations and infrastructure.

V. Approach

A. Detailed description of work performed

This section of the final report is organized chronologically, as a series of quarterly reports, to give the reader a feel for the progression of the work performed. Much of the accomplishments achieved by the project were related to how the process developed to allow the work to take place. The findings section is organized by subject areas.

From November 1, 1995 **To** December 31, 1995

This project has not begun the field work (site preparation) as planned for this quarter due to delays in the Council process. Since this is the first venture of its kind in federal waters there has been much review and discussion. However, significant progress has been made. The project proponents have prepared an Amendment to the sea scallop FMP to allow exclusive use of the project site. This Amendment was approved by the full Council in December for public hearing which will take place on January 19, 1996. The Council will vote later in January on the amendment. If the amendment is approved by the Council it will take about four months for final implementation. This means the project may have exclusive use of the site by late May, 1996. This may not be the best time to seed the site and thus changes to the project plan may have to be made. In all likelihood we will need to have a project extension due to the delays.

A meeting was held on December 19, 1995 in Fairhaven among project participants. There was much discussion on the most appropriate way of capturing the seed scallops for the initial seeding, especially due to the Council delays and new ring size requirements. The general opinion was that it might be best to have one vessel dedicate itself to harvesting the scallops for initial seeding by using special gear on an identified seed bed (peanut pile). We plan to pursue this option by first discussing the idea with the sea scallop industry advisors committee of the Council. Initial contact was made with a number of suppliers of equipment that can be used for the live transport part of the project. Specifications will be developed shortly for the initial purchase of two systems for trial.

We will soon formalize the project technical committee as the Sea Scallop Working Group (SSWG). We plan on inviting all government funded sea scallop aquaculture projects to participate on this panel. One major goal would be to work jointly on bottom cage designs.

From January 1, 1996 **To** March 31, 1996

The project is moving forward at a snail's pace but the most amazing and significant fact is that the project is moving forward step by logical step. On January 19, 1996 a public hearing was held on Scallop Plan Amendment #6 which is the authorization for the project to proceed. While there were some objections voiced by Marthas Vineyard fishermen over the project site, there was overwhelming written comment support for the project to proceed. On January 25, 1996, the New England Fishery Management Council voted to approve Amendment #6 making this the first time an aquaculture type project has been approved for federal waters; a significant milestone for marine aquaculture in this country. NMFS staff, NOAA General Council, and Council staff placed finishing touches on the document for the Federal Register. If all goes according to plan final approval to proceed may be available by June 1, 1996. This entire process to date has taken a significant amount of time and resources and puts the field work about six months behind on the planned time line.

We are still under significant pressure to reach an accord with the Marthas Vineyard fishermen on the site location. Since it will be very important to the future of aquaculture efforts to demonstrate that these activities can co-exist with most types of traditional fishing activities we have decided this issue must be addressed by the project. It falls under our goal of identifying future aquaculture sites and user issues. On March 24, 1996, at the urging of the NMFS Regional Director and local politicians, a meeting was held on Marthas Vineyard with about 16 fishermen plus project participants. A consensus was reached that if we moved the site slightly to the southeast there would be broad active support for the project among all users of the area. We are now proceeding to see if this can be accomplished without impacting the new June 1, 1996 time line. On February 11, 1996 the Army Corps of Engineers renewed our permit until January 13, 2000 or to 18 months after scallops are seeded into the area. Preliminary discussions with the COE indicates a slight move of the area would not be a problem.

Press coverage of the project has been extensive including supporting editorials in some of the regions newspapers including the Providence Sunday Journal. Project participants have been requested to give presentations at many conferences and the AP wired the Council approval nationally.

While site approval has dominated this project this quarter, other work has been accomplished. On January 19, 1996 a meeting was held in Woods Hole concerning the collection and analysis of economic data for the project. Present were project and NMFS economists.

On February 6, 1996, a two day trip on the F/V Westport was made to the site for the purposes of conducting a side-scan survey of the area. A series of transects were made at 1/4 mile spacing and the data was plotted to make a bottom contour map showing sediment type. Control was provided by a differential GPS system purchased for the project. Arrangements have been made with the Marine Biological Laboratory in Woods Hole to charter their small vessel to conduct biological collections at the site in April. Underwater video mapping of the site will be undertaken during April/May as well.

A meeting was held in Hyannis with members of our technical Advisory panel (SSWG). Many of the members have their own sea scallop projects planned or underway. We agreed to work together in designing and building underwater cages for sea scallop culture.

The delays to the project (site approval) have made us rethink how we should collect the initial seed for stocking the project site. To get the project back on track we feel we should conduct a dedicated seed collection cruise as soon as possible after final approval. This will require a special experimental permit from NMFS according to NOAA attorney Joel MacDonald. A letter was written to the New England Council requesting that this be discussed at the March Scallop Plan Development Team (PDT) meeting. At that meeting general criteria for experimental fisheries were discussed but specific requests were not reviewed. We plan to submit a specific experimental fishery request to collect seed to the NMFS Regional Director in the next few weeks.

From April 1, 1996 **To** June 30, 1996

On April 8, 1996 a letter was submitted from Westport Scallop Corporation to the NMFS Regional Director requesting an Experimental Fishery Permit in order to harvest, transport, and seed small scallops. On June 3, 1996 a response was received from Harold Mears, Chief, State, Federal and Constituent Programs Division, requesting additional information. This information includes revisions to the scope of work to be conducted under the S/K grant. These revisions are currently being written.

On April 12, 1996 a meeting was held in New Bedford with draggermen, lobstermen, and scallopers. A consensus was reached on a new site location for the experiment with promises of

active support for the project by the attending fishermen. The coordinates of the new site, were submitted to the Council. The Council on the advice of General Council rescinded the original Amendment for the project in order to go out to public hearing with the new coordinates. The public hearing was held in Wareham on May 17, 1996 and received all favorable comments. On May 23, 1996 the Council's Sea Scallop Sub-Committee met and voted to recommend the Council approve the new Amendment and on June 6, 1996 the Council voted approval. The Amendment is now on its way to being published in the Federal Register. The Council approval process has taken nearly two years but this has not been a waste of time. Much has been learned in the process. On June 26, 1996 project participants Cliff Goudey and Ronald Smolowitz were requested to meet with Council staff and Corps of Engineers to propose a process based on our experiences.

Several technical presentations were made during this quarter. Ronald Smolowitz made a presentation at the Aquaculture coalition meeting in Boston on April 29, 1996 and Cliff Goudey made a presentation at the Offshore Aquaculture Conference in Portland on May 10, 1996. On May 17, 1996 the Sea Scallop Working Group (also our Technical Review Panel) met in Hyannis to receive a presentation by Dr. Miriam Barbeau on the state of sea scallop bottom seeding experiments in Canada. Some of the revisions to the S/K Grant are based on this information, and information collected at the Offshore Aquaculture Conference.

The project, while almost a year behind schedule, still has not suffered any serious set-backs. We have received, or at least have not been denied, all permits needed albeit at a snail's pace. During this process we have greatly increased the awareness at a national level of the problems confronting offshore aquaculture and resource enhancement. With the continued support of NMFS and the Council we will hopefully enter our field phase by October.

From July 1, 1996 **To** September 30, 1996

The project this quarter, like previous quarters, has primarily been waged on the paperwork front. A plan for the new site has been resubmitted to the Army Corps of Engineers and we expect no problems with its approval. An experimental fishery request was submitted to NMFS to cover the harvesting, transport, and seeding of the initial group of scallops. In addition, changes to the scope of work and budget were submitted to the project office including a request for time extension. A request to retain scallops for scientific study was denied by NMFS siting the FCMA definition of scientific research as only that being conducted from scientific research vessels. At a meeting in the NMFS Regional Office (September 30, 1996) the request was resubmitted as an experimental fishery. The long and arduous process has provided a wealth of material to define the roadblocks to aquaculture in federal waters. Ronald Smolowitz and Cliff Goudey were requested to present this information at a public hearing on the National Aquaculture Plan on September 20, 1996. The final report will provide extensive documentation of the problems and propose solutions.

Progress has been made on some other fronts. Two small vessels have been lined up for site work including a biological survey using bay scallop rakes. A Marthas Vineyard fishermen has been found that will be able to build the scallop cages. Live scallops were brought in by the NOAA ship Albatross for our tagging work and transferred to the WHOI Coastal Research Lab tanks. A sea-going technician, with a degree in biological oceanography, has been hired to assist in field operations.

From October 1, 1996 **To** December 31, 1996

Paperwork issues still dominated the project this quarter. Amendment Five to the Sea Scallop FMP was approved authorizing the closed area for the purposes of this project. This is an historical first for aquaculture in federal waters. We now have to wait for the regulations to be promulgated by NMFS. We have not received the experimental fishing permit from NMFS to allow us to collect small scallops with a lined dredge. The Corps of Engineers is reviewing our new site plan but is awaiting feedback from NMFS Habitat Division. The Grants office has approved our time extension request and project changes.

We chartered the F/V Teresa M, a 42' fishing vessel from Marthas Vineyard, to survey the test site with an underwater camera provided by the NURP Program. The bottom was found to consist of areas of hard sand, silty sand, and sand with rocks present. This preliminary survey will be followed up by biological sampling once the permit situation is resolved. Another side-scan sonar survey will also be conducted.

The Woods Hole Oceanographic Institute donated four large navigation buoys to the project that will be used to mark the test site corners. The 60" spherical buoys, with attached light towers, were transported to Westport Scallop Corporation facilities in Fairhaven by MIT Sea Grant truck. The USCG has been contacted and we foresee no problems with the buoy design. The buoys will be sandblasted and painted by unemployed fishermen. We plan to use old scallop dredges to anchor the aquaculture tract marker buoys in place (swords into plowshares).

From January 1, 1997 **To** March 31, 1997

Westport Scalloping Corporation's three year effort to demonstrate sea scallop farming off the coast of Massachusetts has finally moved into the field stage. This S-K project, known as Seastead, is a collaboration between scientists and the sea scallop industry to examine potential scallop enhancement/production strategies. After 30 months of effort all required permits have been secured for the first aquaculture area in U.S. federal waters. The nine-square-mile area is south of Martha's Vineyard and is now closed to mobile gear and dedicated to researching culture strategies. The site, with average depths of about 30 meters, has been marked by large lighted yellow buoys set by the F/V Concordia. The buoys were donated by the Woods Hole Oceanographic Institution and overhauled by fishermen in Fairhaven.

Plans now call for stocking the site with wild-caught scallops sometime in early May, 1997. The scallops will be placed in cages, suspended nets, and loose on the bottom. The scallops will be monitored for growth and mortality. The project managers have been actively soliciting the participation of researchers and industry who have an interest in using the protected site to test equipment and strategies that would further the project goals. A number of research proposals have been generated by this activity.

Significant progress has occurred in the project's supporting activities. Several hundred live scallops have been caught and transported to the WHOI Coastal Research Lab where they are being held for tagging/mortality studies by Dr. Dale Leavitt. Losses have been under 5% in thirty days of holding. Cliff Goudey contacted Riverdale Mills Corporation which then donated plastic coated wire for the construction of fifty large scallop bottom cages. Fukui North America is putting together a proposal for a suspended scallop culture system for the Seastead site. The Project's legal advisor, Attorney Ken Riaf, has been putting together a detailed analysis of the regulatory process to assist in resolving scallop site selection issues.

The Project's economists, Dr. Hauke Kite-Powell and Dr. Porter Hoagland, have worked on two aspects of the economics of scallop farming operations: the market for scallops in New England and the cost structure of vessel operations. Using data on historical scallop landings and prices, they have developed simple models that capture seasonal variations and market responses to changes in landing volume. Historical vessel cost data provide information about fixed, variable, and crew wage costs for trawlers and scallop dredgers in various size ranges. Both market and vessel economic models are useful to the financial and operational planning of full-scale scallop farming operations, and vessel cost data are useful to economic analysis of offshore mariculture operations for other species as well.

The project manager, Ronald Smolowitz, up until this quarter has been fully involved in getting the project permits in place. Now his efforts have shifted to reviewing an extensive amount of literature on scallop harvesting and transport strategies in preparation for the next phase. Dr. Dale Leavitt and Ron Smolowitz have drafted the detailed bottom seeding research plan. Cliff Goudey has been arranging for the side scan and video surveys of the site. We are in the process of developing a mailing list of all interested parties, especially fishermen, in order to distribute a newsletter to keep everyone informed of project activities.

All in all, the project is moving along at a slow and steady pace. The project has received a significant amount of press coverage, nationally and internationally, for toppling barriers to offshore marine aquaculture. Where sea scallop resource enhancement and aquaculture were mocked by most just two years ago, these concepts are now entering main stream management discussions. The Sea Scallop Working Group, which acts as the Technical Advisory Panel for the Seastead project, has received recognition as an effective approach for aquaculture development. Now that we successfully completed the initial phase of the project we look forward to the technical challenges ahead.

Coonamessett Farm

From April 1, 1997 **To** June 30, 1997

Significant progress has been made this quarter. Three dedicated project trips were conducted during the quarter; one using the F/V Contender and two using the F/V Westport. The first trip on the F/V Contender was for the purpose of conducting a side scan sonar survey of the Seastead site, however, equipment problems prevented the accomplishment of the objective. A second trip, using the F/V Westport resulted in a successful side scan survey of the site. In addition a series of biological samples were taken and the bottom was filmed using a video camera.

The third trip, on the F/V Westport was for the purpose of collecting scallops to transport to the Seastead site for seeding the bottom. Approximately 35-40,000 sea scallops were harvested, transported, and seeded on the site. Scallop on deck holding strategies and tagging techniques were tested. Over 300 scallops were tagged by drilling holes in the hinge and inserting various types of tags.

Forty-eight scallop bottom cages were constructed out of the wire mesh donated by Riverdale Mills. We are in the process of trying to determine the best method for providing ballast and keeping the cage floor up above the substrate. A meeting was held with representatives of Fukui North America and Coastal Aquaculture Supply for the purpose of designing an open ocean lantern net array using Japanese nets. This would be in addition to our planned large net array. A total array price of about $6000 was quoted. We will be assessing where we stand on our budget and may submit a request to modify the budget in order to test the Japanese equipment. We will be requesting a time extension in either case due to the late approval for the project site (February 13, 1997).

Initial trials have been conducted to assess the survival of small scallops that are being harvested, handled, and transported on deck of the fishing vessel. To date three attempts have been made to assess sea scallop survival. For Trials One and Two, the scallops were harvested during the last tow of a trip by a commercial scallop vessel (F/V/ Westport) and held on deck in a fish tote with running seawater. In both cases the scallops were held on deck for approximately 18 hours before being transported to the Rinehart Coastal research Laboratory (RCRL) at Woods Hole Oceanographic Institution, a two hour trip by truck. At the RCRL the scallops were placed in a seawater table with flow-through seawater and held for over two months to monitor survival.

From July 1, 1997 **To** September 30, 1997

We are going to use this quarterly report to summarize where we are in the project based on the original work plan categories. Progress this quarter will be emphasized in each section.

1. Final permitting of site

All permits necessary for the site have been obtained. This includes the Army Corps of Engineers permit and the NMFS Experimental Fishing permit. The latter permit took over 30 months to obtain because NOAA attorneys decided it required an amendment to a Fisheries Management Plan; a very long and time consuming process. This makes the Seastead site the first permitted aquaculture area in the US EEZ. A special experimental permit application and procedures was designed and implemented for vessels operating within the site and experimental permits were issued to the F/V Westport and F/V Concordia for project operations outside of the site. There is a permit problem involving the harvest of seed scallops during commercial trips that needs to be addressed; we plan to address this issue next quarter.

2. Grow-out array design and construction

Three different moored grow-out arrays have been designed. The first system, consisting of forty-eight bottom grow-out cages, has been constructed out of vinyl coated steel wire provided free by Riverdale Mills. The cages were deployed this quarter in three strings of ten, nineteen, and nineteen cages, marked by high flyers at each end. The cages have two shelves which were stocked with scallops, ranging in size from 40 to 120 mm shell height, at varying densities. The stocking took place in August after a long steam in which the scallops were subject to warm water temperatures. The scallops were in hard shape by the time they were placed in the cages. The second system, a 20 unit lantern cage longline, has been designed by Coastal Aquaculture Supply and has been purchased using Fukuii nets. All the longline components have been acquired and will be ready for deployment in October. The third system, the large-scale lantern nets, has been designed by project participants and components will be acquired in the immediate future.

3. Vessel modifications

All modifications to the F/V Concordia and F/V Westport have been made. The F/V Concordia successfully deployed three large corner buoys and the F/V Westport has been modified to transport large numbers of live sea scallops. In all likelihood additional scallop vessels will not be utilized due to the difficulty in getting permits.

4. Site preparation

Three large picket buoys have been constructed and deployed to mark three of the site corners; the forth corner being marked by a USCG navigation buoy. The buoys are painted yellow and contain radar reflectors and lights. Additional lane markers will not be used due to concerns about marine mammal entanglement. The site has been surveyed with a side-scan sonar and a composite map drawn. Biological samples have been taken using a lined scallop dredge to provide

a biological baseline. An underwater camera has been dropped on stations throughout the site and video recordings made of the bottom.

5. Scallop harvest, transportation, and seeding

Samples of several hundred live scallops were brought in from regular fishing trips throughout the fall and winter. The scallops were transferred by truck in coolers without water. These scallops were held alive at the WHOI Coastal Research Center with relatively low mortalities. Based on what we learned from these trips , a dedicated seed harvesting trip was made in May and 40,000 seed were transported to the Seastead site. The scallops were harvested using short tows, carefully dumped on deck, and immediately transferred to deck pens and totes that were continuously sprayed with sea water. Upon arrival at the Seastead site, the scallops were dumped overboard, a sub-sample being tagged, along a 400 foot transect. Our work to date indicates that we should be able to transport 400,000 scallops to the site this fall. The biggest obstacle is the distance we need to travel to transport the scallops from harvest areas located on the Northeast edge of Georges Bank to our site. Nearby seed areas all lie within the groundfish closed areas. Transport problems include warm surface water temperatures this year right through the end of September. Harvesting scallops using commercial practices also results in shell edge damage.

6. Monitoring of bottom grow-out sites

The data from the May 20-21 benthic survey of macrofauna at the Seastead site has been processed. Sub-samples of the seed scallops have been sent to LMAH and were necropsied and evaluated histopathologically. Other samples sent to WHOI were used to obtain indices of physiological condition. On August 25th we searched for the seeded scallops using dredge mounted video cameras. While some scallops were spotted it was extremely difficult to make useful observations with this approach. Problems included sediment suspension and inability to operate at slow speeds. We designed and plan to fabricate a low cost camera sled that can be towed by a smaller vessel. We will use TUGOS system components for the sled video system. We have also made arrangements to use an ROV provided free by the NURP Program which will require one of the project participants to be trained as an operator.

7. Site harvesting

No harvesting has been accomplished from the site.

8. Economic analysis

The model to develop the economic evaluation of sea scallop aquaculture has been completed using vessel information provided by several New Bedford scallop companies. The model will be utilized towards the end of the project when field data is available.

9. Site evaluation

A significant amount of information and data has been collected for the purposes of describing potential sea scallop grow-out sites. We are working with UMASS Dartmouth on a Geographic Information System (GIS) that can be utilized for this purpose.

10. Legal regime

A complete record of the process we have completed to get the site has been kept and is undergoing analysis. We are actively participating with the New England Council in providing information that they can use to set up a system for aquaculture site/project evaluation.

11. Project reporting

The project has received national attention and over a dozen formal and informal presentations have been made nationally on the project's progress. We have helped form the Sea Scallop Working Group which has become a major forum for the exchange of aquaculture information.

In summary, the permitting process has delayed this project 30 months. Difficulties in finding seed beds that we would be allowed to harvest and warm water temperatures have caused further delays. We are now poised for a major effort this fall when all gear will be in place and water temperatures will allow for seed transport. The major weak link in the project is the lack of resources for a strong site monitoring program, however, we are working on developing partnerships with other scientific researchers that should enhance our monitoring capabilities.

From October 1, 1997 **To** December 31, 1997

We requested a no cost extension for this project for one year. The request was approved. We also requested an experimental fishing permit to allow us to take 1500 bushels of scallops from the Nantucket closed area to stock the test site. We need a nearby source of seed and that seems to be the best choice. The permit request is under review.

On October 8, 1997, a site visit was made using the F/V Dragon, a 35' lobster boat. We pulled up three cages on each of the three strings that were filled with scallops on September 19, 1997. As previously reported, the scallops that were placed in the cages were in hard shape for a number of reasons. They were harvested during commercial tows and transported a long distance when surface water temperatures were high. As expected, the mortalities were high as reported on the attached raw data logs. Few predators, such as large starfish and crabs, were found in the cages. A slight amount of algae growth was found on the outside of the cages but not on the inside shelves. On the positive side, all three cage strings are still intact at the end of the quarter

even after some severe weather. The remaining live scallops looked in good condition. A cage check is planned for January, 1998. We should also have our camera sled in the water next quarter.

A longline was set out on the site that contains twenty Japanese lantern nets. The design of the longline string was based on recommendations from Japan. One of our cooperating vessels making a routine check on the way back from a trip reported the longline array looked like it had been dragged through because the submerged floatation buoys were bunched up on the surface. A subsequent check did not find the longline array. There are very strong wind and current conditions on this site which make it an excellent test for hardware. It seems this longline array might have flunked.

We had a project meeting to review the results of our economic model. The project economists presented the results in New Bedford to a panel consisting of cooperating fishermen and scallop processors. The economist will now refine their work based on these discussions. We are also working on a newsletter and mailing list to start disseminating some results now that the field work is underway. Our technical panel, known as the Sea Scallop Working Group, has been routinely kept informed of our progress. We are currently preparing a requested paper for the World Aquaculture Meeting in Nevada in February on the project.

From January 1, 1998 **To** March 31, 1998

Our request for an experimental fishing permit to allow us to take 1500 bushels of scallops from the Nantucket closed area to stock the test site was reviewed by the New England Fishery Management Council at their February meeting. The Council members reached consensus that the request should be approved by the Regional Administrator. To our knowledge the permit request is still under review at NMFS.

On January 8, 1998, a site visit was made using the F/V Dragon, a 35' lobster boat. The NOAA weather report indicated 15 knots and 2-3 foot seas. Upon arrival at the site we found that the tide, running against the wind, caused wave heights of 5-6 feet at the site. Each of the three strings were missing one of the two high flyers marking the string ends. On string one, the remaining high flyer was on the up-tide end. This meant that if we over-hauled the gear, working one cage on the deck at a time, we would drift over the remaining bottom cages resulting in fouling the string.

We decided to haul the entire string to get to the down-tide end to replace the high flyer. This was a mistake. The lobster boat was too small and the weather was getting rougher. We managed to get the entire string on deck but could not open and examine the individual cages. We replaced the high flyer and reset the string with plans to re-haul the string from the down-tide end. The weather prevented us from re-hauling the gear. While on deck we visually inspected the cages and found that many scallops were still alive and healthy looking. We particularly looked into one

of the cages we inventoried in October and did not see any additional mortalities (empty shells).

On March 22, 1998, we revisited the site on the F/V Westport with the idea of replacing all the missing high flyers and conducting a full inventory of all the cages. This winter had been very windy and this day was not an exception. The lobstermen that we work with indicated that they had lost many of their buoys in a recent blow so we felt an urgency in getting out to the site. Upon arrival we found that all our high flyers were missing and we could not recover the strings. At this time we have made arrangements with a lobsterman to grapple for the cage strings at the first opportunity. The positions of the strings are very accurate and we do not expect problems with their recovery.

The above experience, coupled with the loss of the Japanese lantern nets, has lead us to re-examine our design concepts for the large array. We are now considering a system based on mussel sock strings suspended from rings made of plastic pipe sections. The open ocean is particularly rough on surface buoys. Large, expensive buoys, such as our corner buoys, can be designed with long service intervals. Typical fishing gear markers, such as high flyers, need frequent inspection and still fail on a routine basis. We suspect that in a secure aquaculture site, free of mobile gear encounters, no surface markings would be required.

On other fronts our veterinary pathologist (Dr. Roxanna Smolowitz) has set-up the equipment and procedures for examining sea scallops. Our economists have completed their model to evaluate sea scallop aquaculture. Project participants and the Sea Scallop Working Group lead in putting together an all-day session on sea scallop aquaculture at the World Aquaculture Conference in Las Vegas during February. The project also received extensive national and international news coverage this quarter.

From April 1, 1998 **To** June 30, 1998

A significant amount of field work was accomplished this quarter; much of it unplanned searching for lost gear. When the Westport Project reached a compromise with the area fishermen on a choice of location, the site we accepted was considered "dead bottom" that was basically not fished. We are beginning to find out that this area has extremely harsh environmental conditions related to wind, tidal currents, and depth. It makes for an excellent testing ground for offshore hardware.

We made several trips looking for our lost cage arrays using grappling gear and our new camera sled. We did not locate the gear but did acquire video footage of the grounds we were to seed with scallops. On June 5-6 the F/V Westport went into the Nantucket Lightship closed area on a seed collecting trip authorized by NMFS. We caught a total of 500-700 bushels of scallops in three ten minute tows and one six minute tow. While in the closed area we also replicated two NMFS 1997 Sea Scallop Survey Stations. We used the two fifteen foot drags; one with a partial liner. The weather was bad, blowing 40 knots plus with 20 foot high seas, greatly limiting our

time and capabilities. The intended purpose of our attempt at replication was to determine if the same scallop bed can be relocated months later.

The scallops were transported to the Seastead Site at night on deck sprayed with water. The vessel took severe pounding and only made six knots into the wind and sea. On arrival at the site the next morning the scallops were shoveled overboard while the vessel drifted along a single transect previously video surveyed. The F/V Sandra Jane, already on site with the video sled, proceeded to follow the F/V Westport and video taped the newly settled scallops.

The F/V Westport also conducted a short dredge tow south of the location we seeded the scallops in May 1997 and caught ten scallops that were most likely from the May 1997 seed drop. The F/V Sandra Jane towed the camera sled in that area and sited more scallops. Interestingly, during the search we found that in an area that we have towed repeatedly, and examined with video cameras, and found to be sand, was now a boulder tow. The boulders were clean of any organisms. The winter storms must of moved the sand away to expose the rocks.

On June 17, 1998 we went to the Seastead Site on the F/V Isabel S to survey the recent scallop seed drop with the camera sled. The scallops were found to be right where we left them. Very few mortalities were observed. Most of the scallops had righted themselves and were settled into the bottom. There was no observed increase in crabs or starfish from previous video surveys.

While towing the camera sled we snagged a line. We hauled the line up and found one of our missing cage arrays. All nineteen cages were hauled and the contents emptied into bags to bring back to port for detailed analysis and measuring. There were many live scallops that had definite growth added since being towed up and placed in the cages last year. The string had one cage that was totally destroyed and the next three abutting cages were obviously cut open and had the scallops removed. We are almost certain that the cage array was towed through, most likely by a clam dredge or scallop drag, and the cages deliberately robbed. Keep in mind, there is nothing worth fishing on this site; no fish, no scallops, no clams.

With the limited funds and time available we are going to focus on monitoring the newly seeded scallops, locating the May 1997 scallop seed bed (which seems to have moved south), finding the two remaining cage arrays, and analysis and report writing. The preliminary results seem to indicate that scallop seed can be transported successfully to reseed new grounds.

From July 1, 1998 **To** September 30, 1998

During this quarter we made an effort to retrieve the remaining two lost cage strings. We hired Dr. Arnold Carr and the R/V Aphrodite to conduct a side scan sonar search of the Seastead site. In addition, we conducted an underwater video survey of the seeded scallop beds.

To survey the seeded scallop bed we lowered a video camera and drifted over the site. Numerous scallops were observed along the previously defined transect. The scallops were recessed into the bottom. Very few clappers were observed and no signs of increased levels of predators were observed, however, this is a difficult observation to quantify.

We located a string of our cages with the side scan sonar and marked the position. The vessel we were on was not capable of retrieving the gear. We notified the F/V Westport of the location of the string. On returning from a scallop trip the F/V Westport attempted to grapple the string with a light hand-held grapple. They snagged the string and managed to get one cage up to the surface before the grapple line failed. Subsequent attempts to retrieve the string using grapples on the main wire failed. It is important to note that the side-scan images of the string indicate that the string was dragged across the bottom.

Three major sections of the final report have been completed. Economists Drs. Porter Hoagland and Hauke Kite-Powell have completed their analysis of the economics of sea scallop farming. Attorney Ken Riaf and Project Manager Ronald Smolowitz completed their review and analysis of procedures for permitting sea scallop aquaculture in Federal waters. Veterinary Pathologist Dr. Roxanna Smolowitz has completed her health analysis of transplanted scallops.

We plan one final video survey of the transplanted scallops before ending the project's funded field work.

From October 1, 1998 **To** December 31, 1998

On November 14, 1998, the F/V Isabel S conducted a video survey of the seeded scallop bed. The bottom topography had changed significantly from the previous surveys. What was flat sand bottom now had significant sand waves, as much as 4-6 inches in height. The scallops were observed to be in excellent condition. There was no signs of mortality or empty shells. Many of the scallops were seen to swim in front of the cameras. Very few crabs were seen. Some of the star fish present were seen on top of scallops but there was no indication of successful predation taking place. The scallop densities seem to be the same as in the previous surveys. There was no indication that the bed was spreading out or moving in any particular direction.

B. Project management

This project was managed by Soren Henriksen, president of Westport Scalloping Corporation. Captain Henriksen has 45 years in the scallop business as a captain and boat owner in New Bedford and Alaska. In 1984 he spent 6 months in Peru establishing a successful scallop aquaculure program in cooperation with the University of Lima. He was be responsible for management of the vessels and grow-out site operations.

Captain Edward Welch, also of the Westport Scalloping Corporation, assisted Captain Henriksen in managing the field operations of the project. Captain Welch was the skipper of the F/V Westport during all of the project operations.

Technical assistance to the project manager was provided by Ronald J. Smolowitz, a consultant in fisheries engineering and an expert in scallop harvesting. Mr. Smolowitz was a NOAA Corps Officer for 20 years and during that time was involved in a wide range of fishing industry projects. Since leaving the NOAA Corps, he has engaged in numerous projects and collaborations on fishing and appropriate technology. He was involved in the literature search, the development of the experimental plans, the *in-situ* observations and specimen analysis, and the data analysis. He also interfaced with the LMAH, Richard Karney, Dale Leavitt, and others on the biological and growth aspects of the project. He was responsible for project reporting.

Also assisting the project manager was Clifford A. Goudey, project director for the Center for Fisheries Engineering Research. He is an expert in fishing gear and offshore aquaculture systems. He dealt with engineering issues associated with the grow-out site, the suspended array, and harvesting gear. He designed and seen to the fabrication of the lighted picket buoys. He was responsible for the water quality instrumentation, video observation equipment, and other underwater gear. He shared responsibilities for data analysis and project reporting with Mr. Smolowitz. Cliff lead in writing the engineering section of this report.

Several aspects of this project were accomplished by persons and organizations not in the employ of Westport Scalloping Corporation. In addition to the consulting by Ron Smolowitz and the involvement of Cliff Goudey of MIT, both described above, several subcontracts were issued to individuals as follows:

Kenneth M. Riaf, attorney, 6 Tolman Avenue, Gloucester, MA 01930. Ken assisted the project manager in dealing with legal and permitting issues. He was responsible for evaluating areas in New England as potential sites for controlled scallop grow-out and array locations. He wrote the Appendix on site selection issues.

Dr. Roxanna Smolowitz, veterinarian, UPenn Laboratory for Marine Animal Health, Marine Biological Laboratory, Woods Hole, MA 02543. Roxanna, a veterinary pathologist, was a member of the technical advisory panel and also provided veterinary support to the project; primarily by performing necropsies on scallop mortalities and assessing the condition of survivors.

Dr. Dale F. Leavitt, biologist, Southeastern Massachusetts Aquaculture Center, Massachusetts Maritime Academy, Buzzards Bay. Dale was a member of the technical advisory panel and provided biological support to the project primarily by conducting biochemical analysis of the scallop meats through the project period. Dale lead in writing the biology section of this report.

Dr. Hauke L. Kite Powell and Dr. Porter Hoagland, Woods Hole research Consortium, WHOI, Woods Hole, MA 02543. Hauke and Porter were the project economists responsible for the collection and analysis of economic data to determine the viability of sea scallop aquaculture and resource enhancement. They wrote the economic analysis section of this report.

One of the goals of this project is to build the infrastructure in southern New England to support a scallop culture industry thus all the contract work was kept local where possible.

All the project participants that have been identified by name were a part of the formal technical advisory panel that came to be known as the Sea Scallop Working Group lead by Dr. Harlyn Halverson. The SSWG provided most of the communication and project outreach efforts.

VI. Findings

A. Actual accomplishments and findings.

Securing the Seastead Site

Fisheries regulations have become extremely complex during the last decade in the Northeastern United States. In 1987, it simply took a one paragraph letter from the Regional Administrator, sometimes issued the day the request was made, to allow a research project to take place in Federal waters (see correspondence section). More recently, very formal public procedures have been set up, that can easily take six months, to allow the same sort of research activities to take place (obtaining an experimental fishing permit). Experimental fisheries usually entail the "relaxing" of an existing regulation to allow accomplishment of a research goal.

What was different about the Seastead project proposal was that there would be a need for some restrictions on the activities of some fishermen; for example, no towed gear over the seeded site. In the eyes of the NOAA General Council, this required an Amendment to the Sea Scallop Fishery Management Plan (FMP) since more restrictive regulations require public process. A complete Amendment would not have been necessary if there were frameworking procedures within the existing scallop FMP for special management areas.

The Council staff did not have the time (more correctly, the priority) to work on writing the Amendment. The Seastead project participants offered to do the work; the first time the private sector wrote an FMP Amendment. Project participants completed the draft Amendment which was then refined by the professional Council staff.

The Council had no set procedures for dealing with reviewing and approving the Seastead project. Presentations were made before several Council Committees before the full Council was able to vote to send the proposed draft to public hearing. The public hearing part of the process turned up two real issues. The first was that there was an important tow for small draggers within the chosen site that did not show up in the NMFS data base. Secondly, there was a fear on the part of the lobstermen that fish in the vicinity of the site that the seeded scallops would attract dredge vessels and gear conflicts would result.

After a number of informal discussions between project participants and the various industry sectors, a new location was chosen that received full support of all parties concerned. The Amendment was re-drafted and finally approved through the system. Complete documentation of this process can be found in the Appendices to this report.

The major accomplishment here was the first set of regulations for managing an aquaculture site in Federal waters. Additionally, a process was established for reviewing and approving future aquaculture proposals.

Army Corps of Engineers Permit

The Fisheries Management Council process concerned itself with the management of the marine living resources in the project area. The Council does not issue an aquaculture permit. The only federal permit required by the Seastead project was from the COE. The Rivers and Harbors Act requires the Army Corps of Engineers (COE) to issue a permit for any activities requiring the placement of physical objects into the navigable waters of the United States. The COE permitting process thus wanted to determine that the Seastead project did not unduly interfere with navigation and that the gear placed into the water would not fail and become a risk to navigation. The COE checks with other agencies of government to make sure there are no problems related to water discharge/water quality, habitat impacts, and introduction of non-indigenous species. This was a straight forward process which can be followed in detail in the Appendices of this report.

The major accomplishment of the Seastead project in this area was to get a process established between the respective agencies to allow for an expedient early review of aquaculture proposals.

Experimental Fishing Permits

The approval of Sea Scallop Amendment Five, establishing the Scallop Experimental Fishing Area (SEFA), was followed by the development of regulatory procedures by NMFS for access into the site by allowed gear and experimental activities (see Correspondence Appendices). The procedures for requesting the SEFA Experimental permit and the issuance of the permit were straightforward and relatively expedient. The greatest difficulties were the lead times associated with the notification requirements. Placing burdens on researchers, and eventually aquaculture site operations, in order to control wild capture fisheries is a major problem area that will have to be addressed in the near future.

The greatest obstacle to this project was the need to get experimental fishing permits for work outside of the SEFA (Seastead site). During the project period NMFS initiated new formal procedures for obtaining experimental fishing permits that greatly lengthened the process. This was compounded by all the issues related to access into the groundfish closed areas. The limitations imposed on the project greatly restricted the amount of work we hoped to accomplish.

The main accomplishment and finding related to experimental fishing has been the identification and documentation of the difficulties with the existing procedures. There is further discussion of this topic in the Evaluation section of this report.

Sea Scallop Working Group (SSWG)

The genesis of the Seastead project was the frustration felt by some members of the sea scallop industry, notably Captains Soern Henriksen and Malvin Kvilhaug, with Amendment Four. They commissioned Ronald Smolowitz to conduct a literature search on scallop culture focusing on the potential for New England which was completed in December, 1993. This lead to a meeting in Congressman Studd's office in Hyannis on January 11, 1994 to organize an effort to develop a sustainable sea scallop industry based on enhanced production techniques. A number of initiatives set their roots from this meeting. Participants agreed on a coordinated approach and complimentary sea scallop proposals were generated (including this Seastead project) and many were funded. The Policy Center for Marine Bioscience and Technology (PCMBT) was encouraged to focus on sea scallop culture in their efforts to foster aquaculture development. Dr. Harlyn Halvorson of the PCMBT took the lead of what is now referred to as the SSWG.

The SSWG has met on numerous occasions (see Appendix) fostering communications and information exchange. The SSWG acts as the Technical Monitoring Group for the Seastead project. The SSWG generated a Blueprint for Sea Scallop Aquaculture in Massachusetts and has actively worked towards the identified goals.

Council Aquaculture Committee/Policy

Project participants have been heavily involved in the Council process to establish policy and procedures for aquaculture in Federal waters. A considerable portion of the evolution of this process has been directly related to the Seastead project. For example, in response to policy questions raised by the Seastead project, the Council hired a consultant (see Brennan Report summary in Appendix) to examine policy issues.

Aquaculture policy in Federal waters is being addressed on two levels; locally and nationally. The project participants, because of the project's experience, have been asked on numerous occasions to give oral and written testimony on policy questions at the national level. One of the major accomplishments of the project, albeit indirect, has been to give federal aquaculture policy issues a sense of urgency.

Engineering

General Design Approach

An important part of this project has been the development of hardware suitable for use in sea scallop culture. This hardware ranges from buoys to mark the location of the approved experimental area to cages for the controlled growing of animals to equipment for reliably observing the growth and dispersal of seeded scallops.

Paramount in the development of this hardware has been two goals: cost effectiveness and maximum compatibility with fishing industry capabilities. This approach has driven the project towards the adaptation of existing hardware and methods rather than the intellectually-tempting approach of initiative a blue-sky design.

The result has been a series of hardware items that have, in most cases, served the purposes of the project well. More important, they represent solutions that are understandable by the project's industry participants as well as non-participating fishermen. In general, there remains opportunities for both major and minor improvements to these project developments. The essential point is that those next steps can be readily made by industry as the practice of sea scallop culture is undertaken commercially.

Experimental Area Picket Buoys

In our application for the experimental sea scallop area, the Corps of Engineers stated a requirement for buoyage to mark the location of the site. In order to meet the requirements of the U.S. Coast Guard for such "privately maintained" aids to navigation, they needed to be lighted, have a radar reflectors, and be painted yellow. The lights needed to be amber (yellow) and offer a flash visible for 4 miles every 4 seconds. A buoy was required on each corner of the 3-mile by 3-mile site. As noted on the revised-location site plan (Figure 1), the northwest corner buoy became redundant with the existing USCG lighted whistle buoy R "2" and was not required.

The buoy design is based on the use of a 60" diameter steel sphere of a type that is in common maritime use. Spheres, already adapted with ballast and tower were obtained from the WHOI Buoy Laboratory scrap yard. Rust was removed and they were painted. The final configuration is shown in Figure 2. Lights (Figure 3) and air-zinc batteries were obtained from Automatic Power, Inc.

A cylindrical battery pack housing was developed which would allow the needed air circulation while protecting the batteries from splash and occasional, momentary submergence. This housing is pictured in Figure 4 and is made from an off-the-shelf polyethylene container with a cover band-clamped on. The dual requirements of air circulation and protection from sea water were

met with a lower compartment that can tolerate occasional short-term flooding from an over-washing wave.

To anchor the buoys on station, old New Bedford-style scallop dredge frames were used. These steel frames weigh 2,000 to 3,000 pounds in air. Mooring chains of a length 1.6 times the depths were made up from 3/4" and 5/8" galvanized chain.

Bottom Grow-out Cages

One form of culture to be evaluated in this project was bottom culture in cages. This method of sea scallop production offered a relatively low-cost approach to contained culture. Through containment, movement and "possession" of the scallops controlled, as it mortality by predators.

We based our cages on the ubiquitous lobster trap, both in design and construction materials. We obtained PVC coated 14 gauge wire mesh, 1" x 1", from Riverdale Mills, a local manufacturer (the two rolls of material were donated to the project, enough for all 50 cages.) Fabrication to the design shown in Figures 5 and 6 was done by a lobsterman from Fairhaven, Mass.

Assembly methods were as practiced for mid-sized lobster traps, except for the lack of entrances. The hinged opening for scallop handling was located on one of the long sides. It hinged from the bottom and in practice, the door was tie-wrapped to prevent or detect tampering.

The cages were arranged in typical lobster-trawl fashion, with 10 fathom of main line between each cage. Gangion lines 6-feet long lead to each cage. The trawls, two of 20 cages and one of 10 cages, were fitted with buoys at each extreme end. A high-flier was used on the eastern ends of the three trawls.

The recovery and growth rates are reported in the main portion of the report. In general, the method proved troublesome in that all the surface buoys were lost before the first scheduled recovery for maintenance and growth measurements. Numerous efforts at grappling were unsuccessful. However, during one of our observation sled surveys aboard the F/V Isabelle S, a main lines was noticed and subsequent maneuvering snagged it on the shoe of the sled. The trawl was recovered and we thereby obtained growth and survival data from 20 cages.

At a later date, grappling from the F/V Westport hooked a second mainline and it was brought to the surface. However, it parted before retrieval could commence. Further grappling attempts at that location have been un-rewarding.

We have concluded that the cage approach is technically sound except for the hardware used for the surface buoy and line. Standard industry practice proved inadequate for the extended periods of soak time combined with the harsh exposure of the site.

Suspended Scallop Array

The evaluation of the off-bottom culture of sea scallops using a large-scale scallop grow-out array was an objective of the project. The approach was to be similar to suspended lantern nets used in Japan for oyster and scallop culture, but scaled up to be compatible with servicing by a typical scallop dragger.

Figure 7 shows our initial concept which included ten grow-out units, each supported by an independent spar buoy. These units were to be arranged in a line array that was kept taut by four opposing anchors, a pair or spherical floats and underwater tom weights. Figure 8 is a plan view of the array, revealing the anchor arrangement.

The scale and robustness of this approach raised the concern of marine mammal specialists at NMFS and an alternative approach was developed. Figure 9 is our alternate design. Here, the large-scale suspended grow-out units are moored individually, suspended in the water column by a cluster of trawl floats with a pick-up line running to a small surface buoy. This approach eliminated the entangling potential of the previous array, particularly its anchors and the horizontal main line.

As this design became more refined, the preliminary economic modeling was occurring. Initial results of this model revealed a very poor economic return for the use of this suspended array approach due to high labor and capital costs. Therefore, we decided to seek information on the biological implications of suspended culture without investing project funds into the costly hardware of our large-scale plan.

A modest-sized, midwater lantern net array was purchased from a commercial aquaculture supplier. This system is pictured in Figure 10. The design and the specifications were developed by the manufacturer with an understanding of the site. The system was installed and loaded with scallops by the project industrial partner. No trace of the system was ever seen again.

Towed Observation Sled

An important element of the project was the observation of the seeded scallops placed in the experimental area. Three things needed monitoring: dispersal, growth, and predator activity. Several options were considered as shown in the following observation option matrix

Option	Pro/Con
SCUBA	Ability to search for and study individual animals. Depth complications, safety issues, cost.
ROV	Ability to search for and study individual animals. Operator skill required, expensive, careful handling required.
Drop camera	Cheap, simple. No isolation from vessel motions, variable field of view.
TUGOS	Some lateral track control, fore and aft views. Operator skill and careful handling required, variable field of view.
Towed sled	Simple, fixed camera height, very robust, operates like dredge. No position control other than vessel track.

Based on this analysis, we opted for a towed sled. Our design is presented in Figure 11 and dimensional views are presented in Figures 12 and 13. The sled was fabricated in a New Bedford welding shop. A Gates underwater housing was purchased along with a Sony Hi-8 handycam. For real-time viewing, two B&W cameras and underwater housings were used, both mounted facing forward. A spare tether from the TUGOS system is used with this sled.

We found real-time viewing is essential for the operation of the sled from a large vessel. This is because the vessel movements dominate the movement of the system with its small size and low towing resistance. The persistent tidal currents at the experimental area required us to adjust vessel speed based on the course relative to the current. Tow speeds of 1.0 to 1.5 knots are ideal for surveying sea scallops and this typically required jogging the vessel in and out of gear based on information from the surface video monitors.

During periods of slack tide, hands-off recording can be done without the video tether. Deployed from a smaller craft, the resistance of the sled and tow cable allows similar, no-real-time-view operation, minimizing the logistics associated with the sled operation.

Biology

The overall objective of this portion of the program was two-fold. First, we proposed to evaluate the biological potential for relaying sub-adult scallops from sites of high recruitment and low productivity to sites with low recruitment. Second, we propose to evaluate the productivity of sea scallops cultured using a variety of culture techniques compared to scallops left in the wild. Several studies were conducted to assess this potential, including

1. A comprehensive survey of the site selected as the SeaStead Scallop Culture site, located as described in previous components of this final report.
2. Three studies to assess the mortality associated with relaying scallops caught using commercial New Bedford style dredges to other sites in proximity.
3. Two studies to investigate the degree of damage that one could expect using conventional dredges that would contribute to the mortality defined in #2.
4. A preliminary measurement of a gonad/somatic and an adductor muscle/somatic index.
5. A baseline estimate of wild sea scallop population growth within the areas that served as a source of the relayed scallops used in this experiment.
6. Two experiments measuring the growth of sea scallops when cultured using a bottom ranching technique.
7. An evaluation of sea scallop growth when cultured using bottom cage technology.

The schedule for completing each of these activities is included in Table B-1. The results of each of these components comprising the biological studies component of the S/K funded program are included below.

Site Survey

Objective: Following the acquisition of permits allowing us access to the SeaStead Sea Scallop Culture Area, we required an overview of the habitat contained within the nine square mile culture area. Therefore, the first objective was to evaluate the bottom composition and the predominant flora and fauna that currently existed on the site.

Methods: To assess the bottom habitat of the SeaStead Sea Scallop Culture site, two different technologies were used. In October of 1996, a video camera mounted on an aluminum frame was borrowed from the National Undersea Research Program (Groton, CT). The camera in frame was mounted such that it provided a real-time view of a one-quarter square meter quadrat when it was deployed to the bottom and setting on the bottom sediment surface. The system also had the capacity to record the bottom views on an 8mm digital video recorder for later analysis. Four video transects were completed following dividing the culture site into four equal square sections, one video transect in each section.

The second bottom survey technique was to conduct a systematic assessment of the bottom within the culture area using a 15 foot New Bedford style scallop dredge that had been

lined with a 38mm nylon mesh bag. The scallop drag was deployed from the F/V Westport and was hauled at approximately 4 knots for 5 minutes. The catch from the dredge was retrieved to the deck and sorted with the major species retrieved, enumerated, and measured. The nine square mile scallop culture site was divided into nine one square mile sectors and one dredge sample was retrieved from each sector.

Results: Video observation of the bottom indicated that the bottom across the entire Sea Scallop Culture Site was a medium to coarse sand with very small occurrences of hard substrate (boulders or rock cobble). The depth across the site ranged from 15 to 18.6 fathom (27-34 meters) and the bottom sediments were moderately rippled, indicating a degree of bottom current or other form of impact from water movement. There was virtually no algae noted in the video transects, consistent with what one would expect from a sandy bottom. The fauna was dominated by the sand dollar (*Echinarcus sp.*) as observed in the video transects.

The dredge samples retrieved from the nine tows conducted on 20-21 May 1997 also indicated the fauna associated with the culture site was consistent with what could be expected for a sandy bottom (Table B-2). The site is predominantly covered by sand dollars, where catches ranged from one-half to six bushels of sand dollars retrieved from a five-minute tow. Other species of interest during our survey were

1. known scallop predators, including
    a. *Asterias sp.* sea stars (3 to 200 per tow)
    b. *Cancer sp.* crabs (0-41 per tow),
    c. lobster (1 in one tow), and
    d. predatory *Busycon sp.* gastropods (1 in two tows plus a few egg cases);
2. commercially important fish species, including
    a. skate (5-29 individuals per tow),
    b. flatfish (3-25 individuals per tow), and
    c. monkfish (0-5 per tow);
3. sea scallops (0-11 per tow).

Accomplishments: The bottom of the Sea Scallop Culture Site was surveyed and characterized in terms of the bottom composition and predominant flora and fauna. The site is comprised of a sandy bottom dominated by sand dollars. Included are low levels of known scallop predators, including sea stars, lobsters, crabs, and predatory snails. The site does support a very small population of naturally recruited scallops (average 2.8 individuals per five-minute tow).

Relay Mortality

Objective: To meet the overall objective of measuring the success of relaying small scallops from areas of high recruitment to permitted culture areas, it was necessary to measure the degree of mortality associated with harvesting and moving scallops to the relay site. Sea scallops are

generally considered to be relatively fragile with respect to handling and we needed to assess the degree of handling they could withstand without causing significant mortality.

Methods: The method of choice to harvest the small scallops was to utilize a commercial size New Bedford style scallop dredge that was lined with a small mesh liner to retain the smaller scallops. Scallops were retrieved in a 15-foot New Bedford dredge following short tows (5-10 minute duration) using a commercial scallop dragger. After the scallops were landed on deck they were immediately sorted out of the pile and held in flowing seawater in fish totes held on deck and in the shucking house. Following the completion of deck loading, usually finished within a twelve-hour period, the boat departed for the culture site without hesitation. Therefore the total elapsed time between harvest and reintroduction into a natural habitat was 24-36 hours.

Initial trials were conducted to assess the survival of small scallops that were harvested, handled, and transported on deck of the fishing vessel. To date three attempts have been made to assess landed sea scallop survival (Table B-1). For Trials One and Two, the scallops were harvested during the last tow of a trip by a commercial scallop vessel *(F/V Westport)* and held on deck in a fish tote with running seawater. In both cases, the scallops were held on deck for approximately 18 hours before being transported to the Rinehart Coastal Research Laboratory (RCRL) at Woods Hole Oceanographic Institution, a two hour trip by truck. At the RCRL, the scallops were placed in a seawater table with flow-through seawater and held for over two months to monitor survival. Trial Three was an attempt to harvest scallops from an area with a known population of smaller "peanut" scallops. This was a directed fishery where the dredge was lined with a small mesh liner to retain the smaller scallops. The scallops were landed and held on deck in fish totes with running seawater. They fishing effort took about twelve hours and the steam to the relay site was another twelve hours. The final transport to dock was another two hours and a final two hours elapsed in relaying the experimental scallops to the RCRL. In total, a maximum of twenty-eight and a minimum of fourteen hours passed between landing the sea scallops on deck and deploying the scallops in the flowing seawater tables at RCRL.

At the RCRL, the scallops were initially measured to determine the size frequency distribution (Figures B-1 & B-2). The sea scallops were observed for varying amounts of time and the valves of dead animals were removed. The total number of dead animals was determined for each trial and percent survival was calculated (Table B-3).

Results: The scallops retrieved in Trials One and Two were of a size that could support commercial harvesting (Table B-3 & Figure B-1). The mean valve depth for scallops harvested in Trial One, measured from the umbo to the leading edge of the valve, averaged 85.9mm ($\pm$6.9) (Table B-3). The size frequency distribution (Figure B-1) is relatively symmetrical about the mean although a small shoulder can be discerned on the larger end of the size distribution. The scallops harvested in Trial Two were slightly larger, mean valve depth of 98.5mm ($\pm$8.6) but the size frequency distribution indicates two size cohorts with a smaller peak at approximately 86mm valve depth and a second larger peak at approximately 103mm valve depth.

Trial Three was an attempt to harvest scallops from an area with a known population of smaller "peanut" scallops. This was a directed fishery where the dredge was lined with a small mesh liner to retain the smaller scallops. As can be seen in Table B-3 and Figure B-2, smaller scallops were harvested. The mean size for the scallops caught in Trial Three was 70.7mm (±9.2). The size frequency distribution suggests a single cohort of sea scallops within this population, although this area was being commercially fished at the time of collection and the fishery may have removed the larger scallops.

The survival rate of the scallops relayed to RCRL during Trials One and Two was very good, 95.9% in Trial One and 91.5% in Trail Two.(Table B-3). A very small percentage of the harvested scallops died during transport and there was no ongoing mortality observed following the initial losses. The results for Trial Three were different. Survival was 71.2% one week after harvest but the mortality continued for a period after the initial handling period where handling induced mortality was expected to occur, thus differing form Trials One and Two. After two weeks, scallop mortality had reached 57.7% of the harvested scallops. Although data was not collected, the sea scallop mortality for the combined animals held at the RCRL following the initial die-off eventually stabilized. The scallops were held at the RCRL through most of the summer and no significant mortality was observed until late August when water temperatures approached the upper lethal maximum, about 22 degrees Celsius.

Accomplishments: Overall the results of the three Trials was very encouraging. Sea scallop survival following harvest and relaying fell within acceptable levels during these experiments. Survival was very good during the spring sampling events and may be correlated with lower surface water temperatures. Sea scallops are very sensitive to higher temperatures during handling (M. Dadswell, personal communication) and most of the handling of scallops in commercial grow-out facilities in Canada is scheduled when the ambient water temperature is relatively constant from the bottom to the surface, i.e. spring and fall. Even under the most stressed conditions where both the surface water temperature during the relay interval and the ambient water temperature at the laboratory were approaching the upper limit for the bivalve, survival was approximately 40%. This closely corresponds to the survival rate of 40% observed by the Gloucester Aquaculture Project with respect to wild scallops that were relayed into cages for experimental grow-out (NFIG funded - R. Taylor, unpublished data). With a more sophisticated seawater delivery system and a temperature controlled scallop-holding facility on-board the fishing vessel, sea scallop survival approaching 80-90% during the relay interval may be attainable.

Extent of dredge damage in relayed scallops

Objective: During the mortality studies above, it was observed that many of the scallops that were dying during the observation interval of Trial Three had damage to the valve and/or had a disarticulated or broken hinge ligament. It is suspected that damage to the hinge area during

harvest causes a significant portion of the sea scallop mortality subsequently observed. If shell and/or hinge damaged leads to an increase in mortality, then it is necessary to assess the extent of shell damage that occurs during harvest of wild sea scallop juveniles for relay. These type of data were collected and analyzed during Mortality Trial Three (May 1997) and during a NOAA sea scallop survey cruise aboard the *R/V Delaware II* in August-September 1997 (Table B-1)

Methods: The sea scallops that were transported to the RCRL in May 1997 for the mortality study in Trial Three were subjectively evaluated with respect to overall condition at two times during the fifteen day study. When the scallops were initially placed in the seawater table, the scallops were assessed as to whether they had damage to the valve or hinge. Nine days later, the dead scallops were removed and were matched to the damage evaluation from the initial observations. At this point, the remaining scallops were subjectively evaluated as to their health status. During this evaluation the sea scallops were judged to be either in good, fair, or poor condition. Six days later, the mortalities were again removed and the dead individuals were matched to the subjective evaluation from the previous sampling interval.

To develop an estimate of the amount of damage inflicted on small scallops harvested using a conventional scallop dredge a follow-up experiment was undertaken. The follow-up experiment was conducted in conjunction with a sea scallop research cruise supervised by Drs. Idoine and Han for the Northeast Fisheries Science Center aboard the *F/V Delaware II* during 26 August to 2 September 1997. The objective of the cruise was to sample and tag a population of scallops sampled from a transect across the northeast peak of Georges Bank. To accomplish this, sea scallops were collected in the NMFS standard 8-foot scallop dredge at a large number of stations. At each station the dredge was deployed for approximately a 5-10 minute tow and the contents were loaded onto the deck. The scientific crew would subsample the catch and retain those scallops that they considered appropriate for measuring, tagging, and releasing back at the collection site. As an addendum to this study, I surveyed all of the scallops sampled by the science crew and retained those scallops that had damage to the valve or hinge area. These sea scallops were measured and the extent of the valve damage was evaluated and recorded.

Results: The results of the assessment of the damage in the scallops harvested using a lined dredge on 26 May 1997 is presented in Table B-4a. A total of 8.9% of the landed sea scallops were damaged with either a broken valve or a disarticulated hinge. Of those 19 damaged individuals, 17 (89.5%) died within nine days of landing and 100% of the damaged scallops died by fifteen days post-harvest. The mortality of damaged sea scallops represented 15.5% of the total mortality measured during the fifteen-day interval.

A comparison of the size frequency distribution of the dead sea scallops to the size frequency distribution of the total landed population suggests that the mortality is disproportionately distributed to the smaller sizes of the population, based on the shape of the distribution curve (Figure B-4). A comparison of the average valve size of the different subsets of the landed sea scallops indicates that there is no significant difference between the average sizes of

the four subsets (Table B-4b).

Given that the damage inflicted during the harvest of sea scallops lead to 100% mortality in Trial Three, it was considered important to evaluate the degree of damage expected in a routine harvest situation. The NOAA/NMFS Sea Scallop cruise of Aug.-Sept. 1997 provided the opportunity to investigate that aspect of scallop harvest. On the whole, damage to sea scallops harvested using a small dredge towed for short periods of time was approximately 9.7% of the total catch (Table B-5). The extent of damage to the harvested sea scallop population ranged from 1.2 – 21.0% (Table B-5). A plot of the size frequency distribution of the damaged sea scallops compared to that of the total landed population suggests that the larger scallops were damaged to a proportionately larger degree than the smaller sea scallops (Figure B-5).

Accomplishments: Damage to the valve or to the hinge area of a sea scallop during harvest will result in mortality. With the functioning of the valve or the hinge ligament compromised the sea scallop may not be able to position the valves appropriately for feeding and would be unable to move by swimming. Additional damage to the soft tissue may have also occurred during the trauma that impacted the hinge ligament. Therefore, it is imperative that scallops that are being harvested for relay be caught using short duration tows that minimize the potential damage while in the dredge.

The size frequency distribution of the damaged scallops, relative to the total landed population, provides conflicting information. In Trial Three, the size of the damaged sea scallops was skewed to the smaller side of the total population. This led us to initially speculate that the damage was predominately occurring in smaller sized scallops. Subsequent data, collected during the NOAA-NMFS Sea Scallop Cruise, contradicts this observation. During the research cruise, the damaged population is skewed to the right or toward the larger end of the harvested scallop population. Further investigation into the development and strength of the hinge ligament relative to the size of the scallop and the stresses experienced during harvest is warranted.

Given that shell and hinge damage inflicts 100% mortality to the damaged population, it is important that a less damaging harvest strategy be developed. With some attention directed at preventing valve and hinge ligament damage, the overall survival rate of sea scallops could be expected to increase to over 90% for scallops relayed out of areas with high concentration of small scallops.

Gono-somatic and other physiological indices

Objective: Valve growth and soft tissue growth are frequently not coupled in bivalve mollusks. Therefore it is important to evaluate the relative increase in soft tissue mass and, more importantly, the adductor muscle mass when studying scallop growth. Sea scallops are harvested and processed to retrieve the large adductor muscle and the overall size of that component is the

most important measurement when considering the economic viability of sea scallop culture. With that in mind, we conducted a baseline evaluation of the various indices of condition that may be applied to monitoring sea scallop growth and performance during the various aquaculture scenarios developed in this study and in other studies.

Methods: Twenty-five scallops were randomly selected from the sample returned to RCRL and measured for the following parameters:

1. Valve length, width, and depth: measured using a Vernier caliper,
2. Live weight: the whole scallop weight measured using a single pan balance,
3. Wet soft, wet meat (muscle), wet gonad, wet viscera, and wet shell: the scallop was shucked and the component parts were separated from each other, blotted dry, and weighed on a single-pan balance,
4. Dry meat, dry gonad, dry viscera, and dry shell: each component was weighed on the single-pan balance following drying in a 60°C oven for 48 hours,
5. Calculated dry soft: the sum of the items described in # 4 above, excluding the dry shell,
6. Soft %DM, gonad %DM, meat %DM, and viscera %DM: percent dry matters calculated as the dry weight of the component divided by the wet weight of the component multiplied by 100,
7. Wet meat – wet soft ratio and wet gonad – wet soft ratio: indices calculated by dividing the wet weight of the component by the wet weight of the total soft tissue,
8. Dry meat – dry soft ratio and dry gonad – dry soft ratio: indices calculated by dividing the soft weight of the component by the soft weight of the total soft tissue,
9. Dry soft – dry shell ratio: an index calculated by dividing the dry soft tissue weight by the dry shell weight and multiplying the quotient by 100.

Results: Three indices may prove to be important in monitoring the health and productivity of the sea scallops held within an open-ocean culture system. These are

1. the meat/viscera index, calculated by dividing the wet or dry weight of the adductor muscle by the wet or dry weight of the total soft viscera,
2. the gonad/viscera index, sometimes called the gono-somatic index, calculated by dividing the wet or dry gonad weight by the wet or dry weight of the total soft viscera, and
3. the traditional bivalve condition index calculated by dividing the weight of the total dry soft viscera by the dry weight of the shell and multiplying the quotient by 100.

A summary of these three indices and other parameters that were measured on this population of sea scallops collected during the 26 May 1997 trip is presented in Table B-6.

Depending on whether you are using the wet or dry measurements, the meat/viscera index was between 42.8% (wet) and 50.4% (dry). In other words, the adductor muscle comprised approximately 50% of the total visceral mass in the sea scallop. The gonad on the other hand, represents about 15% of the total visceral mass (17.3% wet or 10.2% dry). The average overall

condition index was approximately 13.8 (±3.2) for the same population of sea scallops.

A second use for these data is to produce a means to estimate the total soft tissue or the muscle mass in sea scallops without destructively removing the scallop from the cultured population. To accomplish this we plotted the wet soft tissue or the muscle mass against the valve depth of the scallops measured in this component of the study. The plots were then fitted, using best-fit methods, with a logarithmic model to describe the relationship between muscle mass or soft viscera mass and the size of the scallop. These data are presented in Figure B-6. The relationship between soft tissue and scallop size is best described as:

Soft Tissue Wet Weight = 47.6*Ln(valve depth) – 177.3 (r2 = 0.9076) (1)

The relationship between adductor muscle mass and scallop size is best described as:

Adductor Muscle Weight = 15.6*Ln(valve depth) – 56.7 (r2 = 0.8868) (2)

Accomplishments: The indices reported in this study were measured on a range of scallops that were harvested in late spring (May). In looking at the gonad/viscera index, one would expect, if these values were tracked year-round, that one would see a cycling of the gonad mass where the index would increase as the sea scallops approached reproductive activity and then would decline to a low point immediately following spawning. Careful monitoring of these data would permit the culturist to monitor gonadal development and the cycle of reproductive activity in their product. These data would be very important if the scallop is being marketed as a "roe on" product, as is in demand in the European market.

If the scallop is being marketed in the traditional U.S. market, as the adductor muscle only, then it would be important to monitor the meat/viscera index to monitor the growth and development of the adductor muscle relative the overall growth of the scallop. This relationship, between muscle growth and scallop growth, can also be monitored by using the graphical relationship between muscle mass and valve size, as is represented in Figure B-6.

The classical condition index can potentially define the general physiological state of the scallop, provided that the data are ground-truthed with respect to the performance and survival of the cultured scallops. This has been investigated in the soft-shell clam (Leavitt 1996) and other bivalves (Leavitt unpublished data) and the relationship between soft tissue weight or other tissue component and some indicator of bivalve size does allow one to generate specific observations on the health and performance of the bivalve. The one caveat is the need to generate adequate baseline information to be able to interpret the data collected. The data collected in this study provides a first attempt at investigating these relationships in cultured animals.

Growth of wild scallops

Objective: In order to assess the overall performance of sea scallops held within different aquaculture technologies, we needed to generate an estimate of the growth potential of the scallops if they were left undisturbed at the wild harvest site. By knowing the growth potential of the wild scallops, we have a reference point for comparing the performance of the cultured scallops to that of the wild scallops to evaluate the efficacy of relaying and holding scallops under manipulated conditions.

Methods: Data on a population of sea scallops were collected from a NOAA Sea Scallop Assessment Cruise (Cruise #9705). Two samples of the population were collected on 6 August 1997 (Tows 239 & 240) and the size frequency distribution was measured. The Sea Stead Project repeated the same tow tracks approximately one year later and the size frequency distribution of the sampled population was again measured. The change in the mean valve depth of one cohort of sea scallops sampled in consecutive years permits us to estimate the growth rate of the cohort when left undisturbed under natural field conditions.

Results: The size frequency distribution of the sea scallop population at the NOAA Sampling Sites #239 & #240 are represented in Figure B-7a. A single cohort (labeled cohort A – Figure B-7a) of sea scallops was selected from the 1997 data and the mean valve depth of scallops from both sampling stations was compared (Figure B-7b). Because there was no difference in scallop size of the selected cohort between the two stations (Table B-7), it was assumed that the cohort was from the same recruitment event, probably from the previous year (1996), and the data were combined.

The combined data compared between 1997 and 1998 indicated that the single cohort of sea scallops had grown 32.3mm in valve depth over the course of 302 days (Table B-7). The average daily growth increment was 0.106mm per day.

Accomplishments: The growth data indicate that the sea scallops at the wild collection site grew well over the course of the year. They increased in valve depth from 64mm to 96.4mm, representing a 50% increase in size over the 302-day interval. In terms of marketable product, using Formula #2 derived above, the meat count (number of scallop meats per pound) decreased from 54 meats/lb. to 31meats/lb. This represents a significant increase in the production of marketable product. These data will provide a basis for comparison to evaluate the scallop growth rate of animals held under aquaculture conditions at the SeaStead site.

Bottom Ranching

Objective: There are a variety of methods that can be applied to culturing the sea scallop and the

objective of the SeaStead Project was to evaluate as many of these technologies as could be deployed at the site. The first technology considered was the least intensive system available – ocean ranching. The tactic employed in ocean ranching is to relay the scallops to the culture site where they are deposited on the bottom with no restraint from emigration or protection from predators. Ocean ranching is the least complicated in terms of equipment and technology, relying solely on a means to hold live scallops on deck with a minimum of stress. The SeaStead Project proposed to evaluate ocean ranching as a technology for culture of the sea scallop.

Methods: Two separate ocean ranching experiments were conducted during the course of the project. The first attempt occurred during 25-26 May 1997 where 61 bushels, equivalent to approximately 38,000 individual scallops, were harvested at a site near Stellwagen Bank and relayed to one location within the SeaStead permitted area. Of these 38,000 scallops, seventy-five were measured and tagged with individually numbered tags and one-hundred and ninety-seven were measured and marked with colored nylon tie-wraps, totaling approximately 1% of the total number of scallops deployed. A second subsample of approximately one-bushel of scallops (619 individuals) was measured to generate a size frequency distribution for the deployed scallops. The ranched bed of scallops was left undisturbed for nine months and then followed by a number of unsuccessful attempts to collect some of the deployed scallops. The bed was eventually rediscovered and a small number of the deployed scallops were recollected and measured.

Based on our experiences with the initial attempt at ocean ranching, a second experiment was conducted using scallops collected on 5 June 1998. In the second attempt, five hundred-bushel, equivalent to approximately 150,000 scallops, were relayed to a site within the SeaStead zone. A subsample was measured to provide an estimate of the size frequency distribution of the deployed scallops. The protocol for the second bottom ranching experiment increased the frequency of the observations on the relayed bed of scallops to ensure the bed could be tracked over time. A subsample of the ocean ranched scallops was collected by dredge and measured on 2 August 1998 to determine if any growth could be detected in the population.

Results: Because the bed of relayed scallops was left undisturbed for the first nine months, it was difficult to find the bed for subsequent sampling. As a result of this difficulty, the bed was sub-sampled at a very small level after 374 days. Although the number of scallops collected after 374 days at the SeaStead site during the first bottom ranching experiment was very small (ten individuals), the average valve depth of the ranched scallops had increased from 70.1mm in May 1997 to 89.5mm in June 1998 (Table B-8 and Figure B-8a). This represents an overall growth of 19.4mm or a daily growth rate of 0.052mm/day.

The second bottom ranching experiment resulted in a more successful tracking of the relayed bed. The strategy employed for tracking the second ranching experiment was to place a video observation sled on site during deployment and again within a week after the initial deployment. Observation on the relayed bed was continued whenever the opportunity arose

where the limitation was the accessibility to the commercial scallop dragger and the video sled at the same time.

The second ocean ranching bed was sub-sampled after fifty-eight days to measure the size of the deployed population. The size frequency distribution of the scallop population as measured at the time of deployment and at fifty-eight days post-deployment is represented in Figure B-8b where the mean valve depth at time 0 was 107.9mm whereas after fifty-eight days it was 106.4mm (Table B-8).

Accomplishments: Sea scallops were deployed in an ocean ranching situation at the SeaStead sea scallop culture site on two occasions. They were subsequently sub-sampled after 374 days in experiment one and after fifty-eight days in experiment two. The daily growth rate of the scallops in experiment one was 0.052mm/day, approximately one half of the rate observed in the undisturbed population (0.106mm/day). Because the number of scallops collected during the second sampling event was very low (ten individuals), the data collected may not represent the entire range of the relayed population and the observed growth rate may not be accurate.

The second ocean ranching experiment has resulted in the researchers being able to track to relayed scallop bed more carefully using video cameras. Unfortunately the duration of the second experiment has been very short with the second sample being collected only fifty-eight days post-deployment, resulting in no observable growth in the population. This population will continue to be monitored and more data will be collected after a longer time interval in the future.

This project has demonstrated that relaying sea scallops and deploying them in an ocean ranching situation is biologically feasible. The scallops can be tracked and monitored and scallop growth can be demonstrated. More extensive experimentation will need to be developed to monitor ranched populations to assess the overall survival and growth, thereby allowing the culturists to develop a more complete assessment of the biological and economic feasibility of ocean ranching of sea scallops.

Bottom Cages

Objective: A more intensive method to raise sea scallops is to house them in some sort of predator exclusion apparatus, such as a wire mesh cage. To test the concept of culturing scallops in bottom cages, scallops were relayed from a wild population into cages constructed of one-inch plastic coated wire mesh. The cages were deployed on the bottom at the SeaStead scallop culture site. During the grow-out interval in the cages the scallops were assessed for mortality and growth.

Methods: Scallops were relayed from the wild population to a series of three trawl lines of cages with each line consisting of ten to twenty cages. The design and construction of the cages is

described elsewhere in this report. The cages were stocked on 19 September 1997 and deployed. On 19 October 1997 three cages from each line were sampled for mortality within the caged population and the size frequency distribution of the initial population was measured on a the sub-sample of scallops in the nine cages. The cages were left on-site for 236 days after which one string of cages was recovered (1 June 1998) and all of the scallops or empty valves in the cages were measured.

Results: Two parameters were monitored as an evaluation of the efficacy of bottom cage culture, mortality and increase in valve depth (i.e. growth). The most pressing issue was scallop survival in the cages. Immediately following the initial stocking of the bottom cages, there was an extensive mortality. By the time of the first sample, 19 days after initial stocking, mortality rates ranged from 43% to 97% with the average mortality observed in the cages sampled being approximately 75% (Table B-9). Following this initial wave of mortality, scallop mortality was relatively low, ranging from 7% to 9.5% in the two cages that were sampled both on 8 October 1997 and 1 June 1998.

The growth of the caged scallops was measured by comparing the size frequency distributions and the mean valve depths of samples of the caged scallop populations between 8 October 1997 and 1 June 1998 (Table B-10 and Figure B-9). Scallop growth averaged 21mm over the 236 day sampling interval resulting in a daily growth increment of 0.089mm/day.

Accomplishments: As was noted in the laboratory experiments on scallop survival following relaying, stress or damage due to handling sea scallops during relaying results in significant mortality to individuals within a population. The mortality that was observed in the cage experiment (average of 78.2% mortality) was the highest noted for all of the experiments undertaken in this study. As was stated above, there is a great need for research to be conducted to address the development of a less damaging method to harvest scallops destined for relay and an effort must be put forth to develop appropriate technology for transporting live scallops aboard commercial fishing vessels. Correcting these two issues could probably result in a decrease in the overall mortality to below 20% for relayed scallops.

Those scallops that survived the relaying and deployment in the bottom cages performed relatively well. They grew from 68.5mm to 89.5mm for a total growth of 21 mm in 236 days. This translates to a daily growth increment of 0.089mm/day. This growth approaches the growth noted for the population of scallops left untouched in their native habitat (0.106mm/day). With more control on handling stresses and on issues such as stocking densities, which were not carefully controlled in the current cage experiments primarily due to extensive mortalities, coupled with a better understanding of the environmental requirements of the sea scallop, we conclude that sea scallop culture could become a viable form of bivalve mollusk aquaculture within the Exclusive Economic Zone in U.S federal waters.

B. Significant problems

There were some significant problems that severely handicapped this project. The first and greatest was the extreme amount of time and effort it took to get the experimental site approved. In many ways this was not a waste of time because we accomplished a tremendous amount of groundbreaking for future research and aquaculture /resource enhancement efforts. It did however subtract from the scientific and technical work that should have been accomplished by this project.

The second major problem was the significant restrictions placed on the project by NMFS Fisheries Management authorities. They effectively prevented the project from harvesting seed by preventing access to potential seed beds in the groundfish closed areas. When we did locate a seed bed during a fishing trip, with a NMFS observer onboard, they refused to allow a liner to be placed on the dredge. When closed area access was finally approved at the end of the project, they restricted the fishing time to the point we could not scout for seed beds even with a NMFS scientist onboard.

The NMFS requirements for seven day notification before going out to even check the scallop site and the prohibition on mixed trips frustrated any attempt to conduct the project in an economically viable manner, i,e,, using vessel time efficiently. This greatly limited the amount of time available to the project personnel to conduct in situ research.

A final problem, though not completely unexpected, was the fact that a mobile gear vessel towed through the site destroying all three bottom cage strings and possibly the lantern net array, We suspect the vessel was a clam dredger. We knew there was a high likelihood of this type of gear conflict which will need to be taken into consideration in projects of this nature.

C. Additional work needs

We are only at the initial stages of making scallop resource enhancement a reality so there are significant research and management problems to be addressed. We now have a research site established for at least the next two years. The site is marked and there are two beds of seeded scallops within the site. At a minimum, the beds should be monitored on a regular basis.

VII. Evaluation

In our project proposal we listed 14 questions to be answered to evaluate the project impacts. We will now go through those questions and provide answers.

1. Do we gather sufficient information on scallop transport, seeding, predators, and their control to proceed properly in subsequent phases of the project?

We gathered a significant library of information on scallop culture, transportation, seeding and predator control. This information was augmented by a scallop workshop put together by project team members at the World Aquaculture Conference. This information allowed the project to proceed though we were not permitted to practice predator control on bottom seeded beds.

2. Are we able to satisfy the regulatory and permitting requirements of the U.S. Army Corps of Engineers, the U.S. Coast Guard, the Management Council, NMFS, and other agencies with respect to our chosen site?

We satisfied all regulatory and permitting requirements of the above mentioned agencies.

3. Is the moored, suspended scallop grow-out array serviceable and does it survive the weather it is exposed to during the project duration?

As we progressed through the project planning stages, waiting for permission to work the site, it became apparent that we did not have the resources for the proposed large array system. In addition, the preliminary economic analysis coupled with marine mammal concerns made this approach seem less promising. We opted to test the off-the-shelf Japanese lantern net array and this did not survive the site conditions.

4. Are the modification done to the two New Bedford scallop draggers judged by the captain and crew to be proper and sound?

The modifications to the vessels for the purposes of transporting scallops were easily accomplished and any operational problems were solved.

5. Are the live transportation units we develop capable of keeping large quantities of scallop alive for transport and seeding?

We tested several types of containers for transporting scallops. However, scallop transport needs to minimize handling of large quantities of scallops. In the end deck loading was the best solution given that transport can occur in cold water temperatures and at night.

6. Are we able to successfully harvest small scallops and seed the bottom and load the array?

We did not harvest scallops as small as we would of desired due to the problems stated in the report. We did harvest enough scallops for bottom seeding and loading cages.

7. Do the cooperating vessels see sufficient incentives to seeding their lane and do they adopt a sense of ownership and the associated responsibilities?

We did not use the scallop vessels as initially planned because of the difficulties in getting permits. In addition, new ring size increases eliminated any bycatch availability for seeding.

8. Is the growth of seeded scallops within the grow-out lanes sufficiently greater than on the fishing grounds to make this approach to resource utilization attractive?

We did not accomplish enough work to answer this question. The advantages of transporting scallop seed to new areas are complex and deal with many issues beyond growth rates.

9. Do the growth rates found in the suspended array justify the capital costs and labor associated with them?

Regarding bottom cages; no.

10. Do we identify a sufficient number of suitable scallop grow-out sites in New England to allow the allocation of all fishery participants their own grow-out areas without significant negative impacts on competing fisheries?

We did not identify specific sites but did focus on the issue of criteria for the purposes of identifying sites.

11. Do we develop model law to facilitate the growth of sustainable scalloping?

We helped to establish the procedures and developed fishery management plan materials that are now in place to allow aquaculture to move forward.

12. Is our report readable and does it properly convey the findings of the project?

Yes.

13. How widely do we disseminate the report? Do those who want the information get it?

The Sea Scallop Working Group has widely disseminated the progress made by this project as reported in this report..

14. Finally, is our approach taken seriously by the industry and those who manage it?

The scallop industry is now moving forward with a plan to manage scallops using a rotating area management system as we proposed including areas for seed harvest and seeding. This last question and answer sums up the success of this project.

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APPENDIX A

Engineering Drawings

and

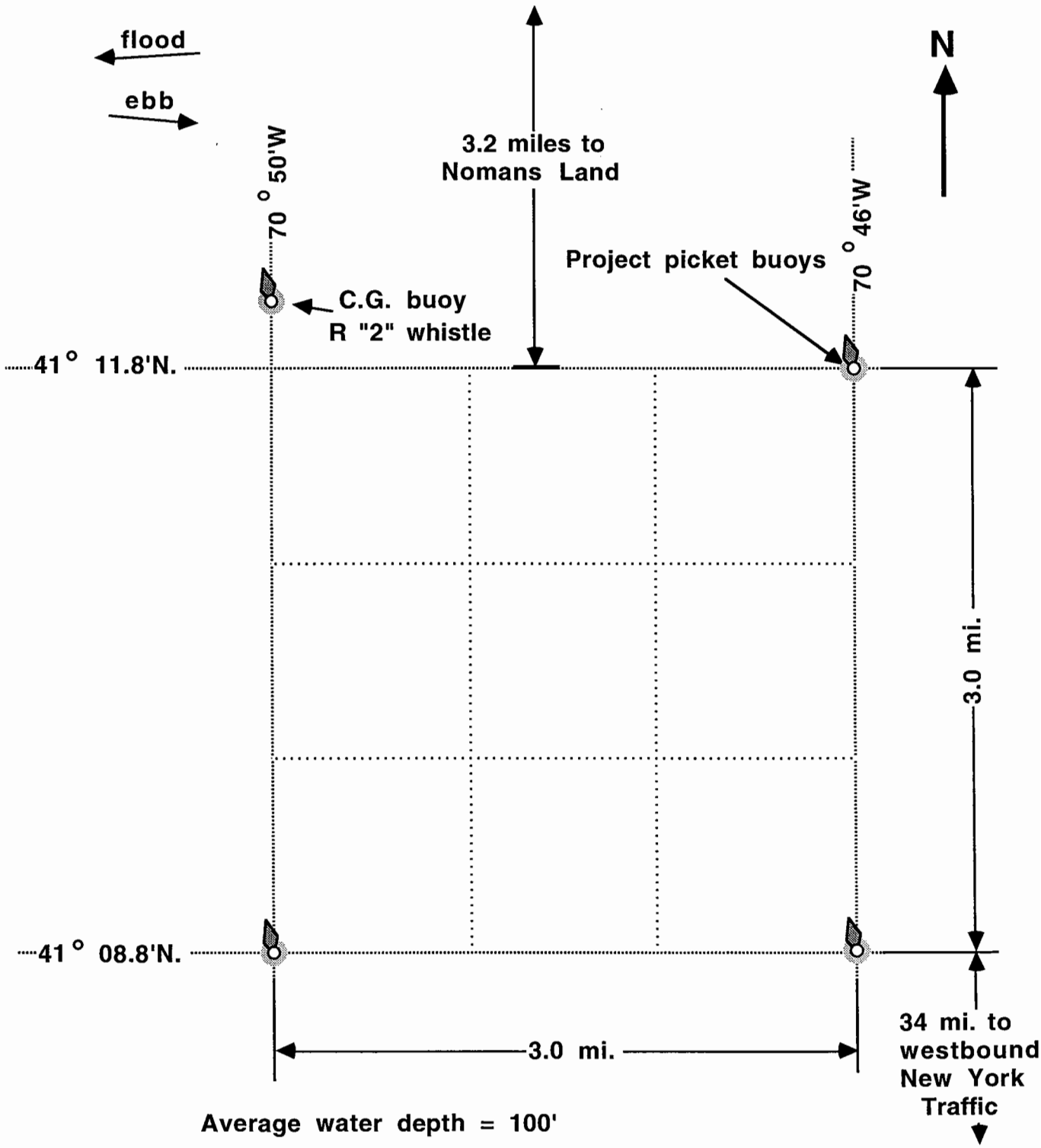
Biological Data

A1

Sea Scallop Experimental Area

C. Goudey
12-13-96

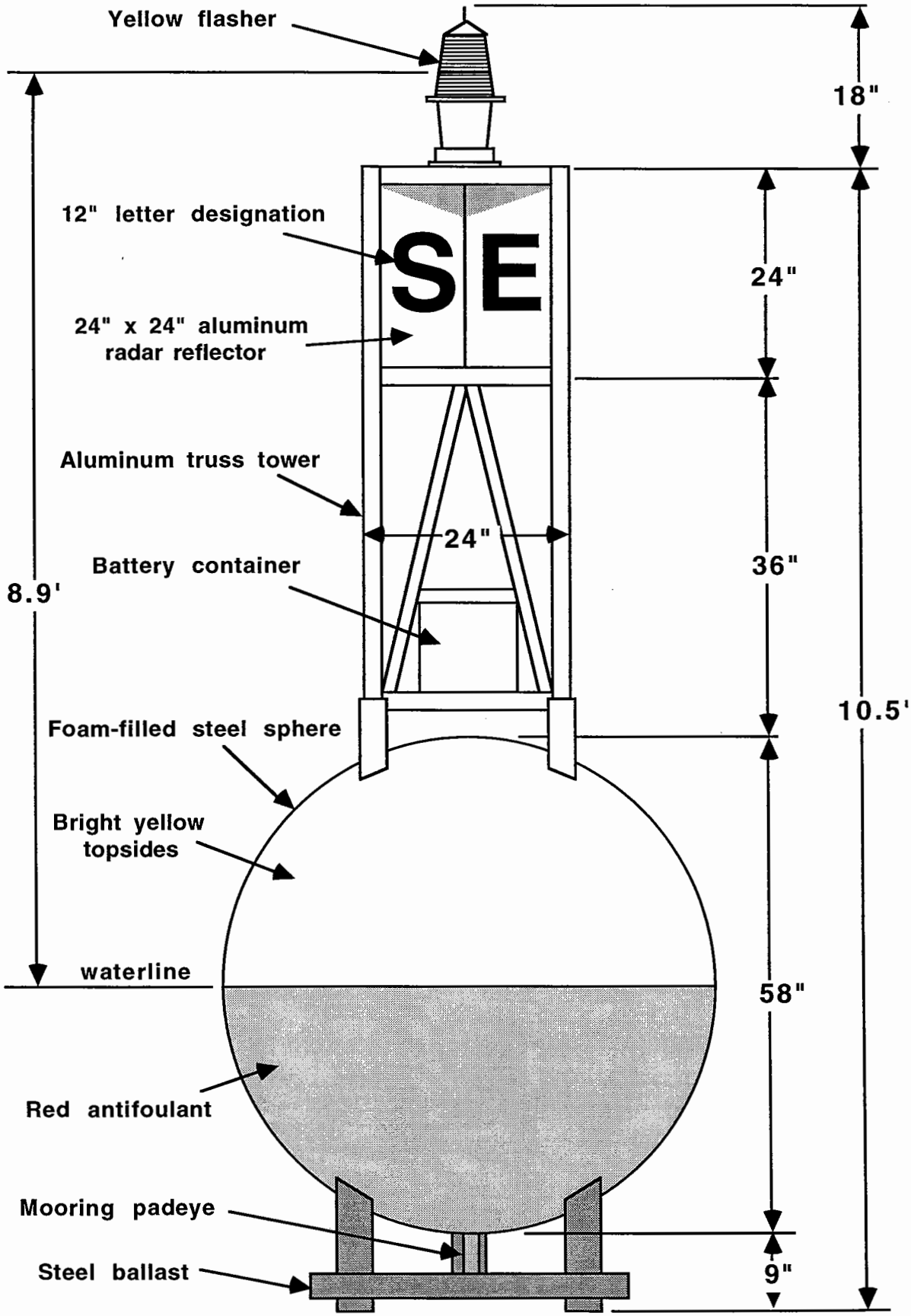
1" = 0.75 mi.



A2

Spherical Radar-Reflecting Lighted Buoy

C. Goudey
12-31-96



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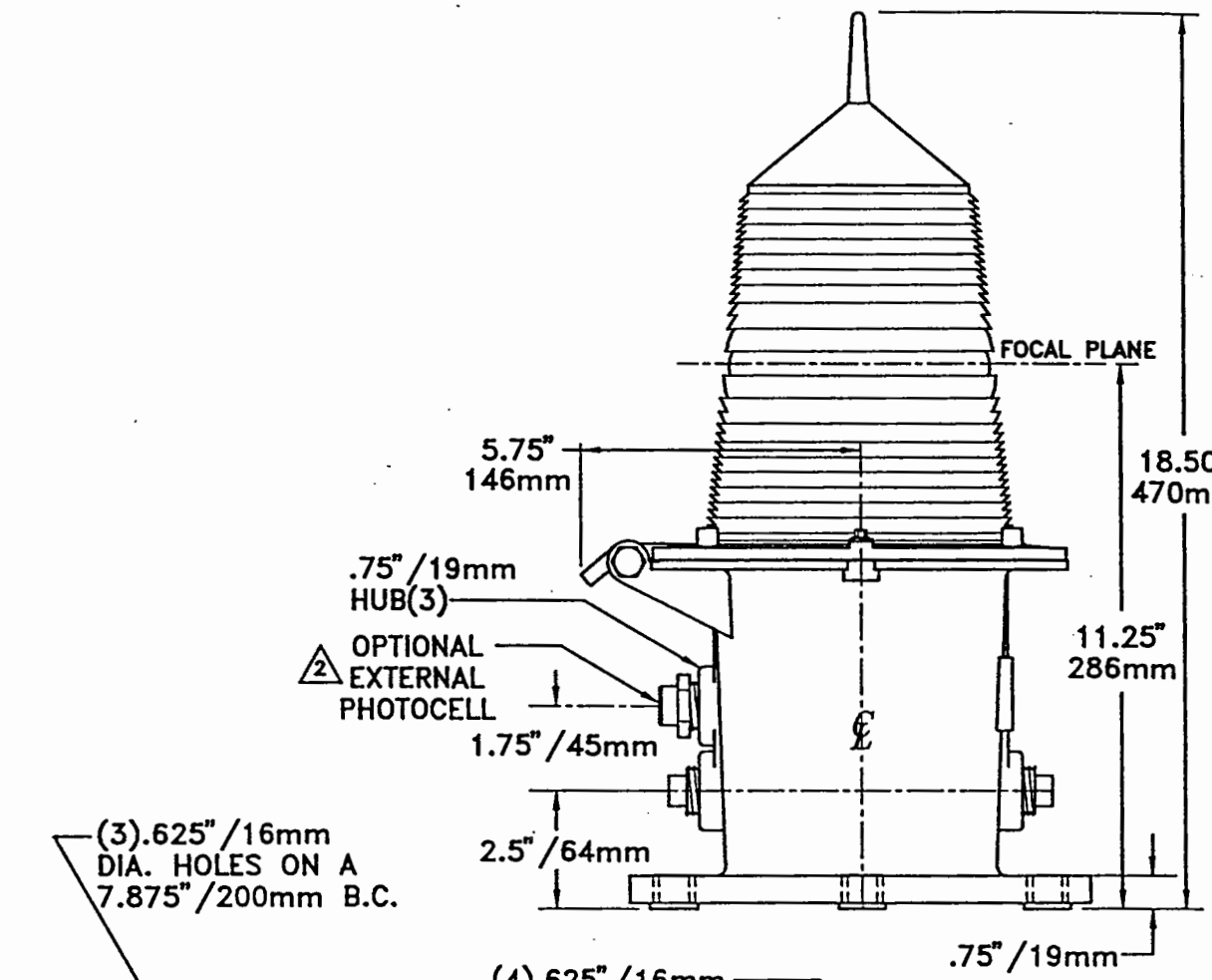
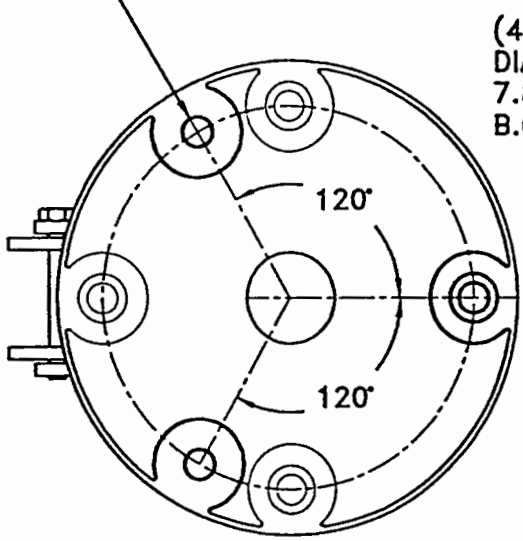
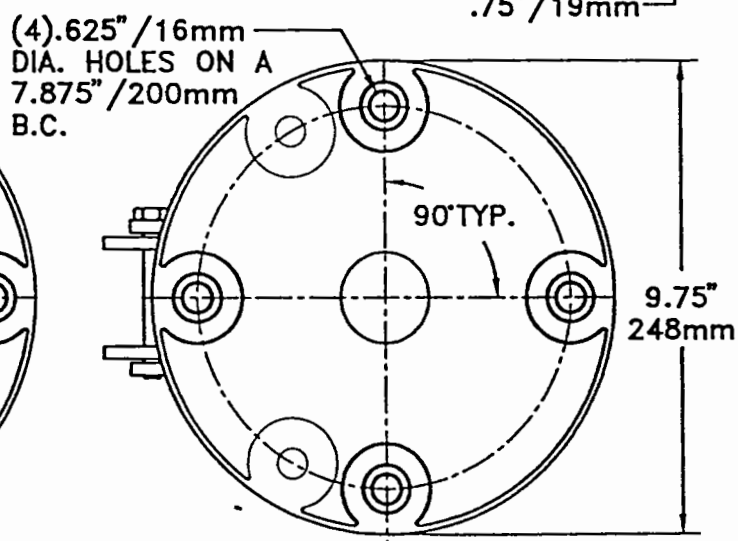




BOTTOM VIEW
ALTERNATE MOUNTING



BOTTOM VIEW
STANDARD MOUNTING

2 ADDED mm DIMENSIONS AND CURRENT PHOTOCELL

REVISIONS			
	No.	DATE	BY
REDRAWN TO ACAD	1	12-8-93	J.O.
	2	2/22/96	ADF
	3		
	4		
	5		
	6		

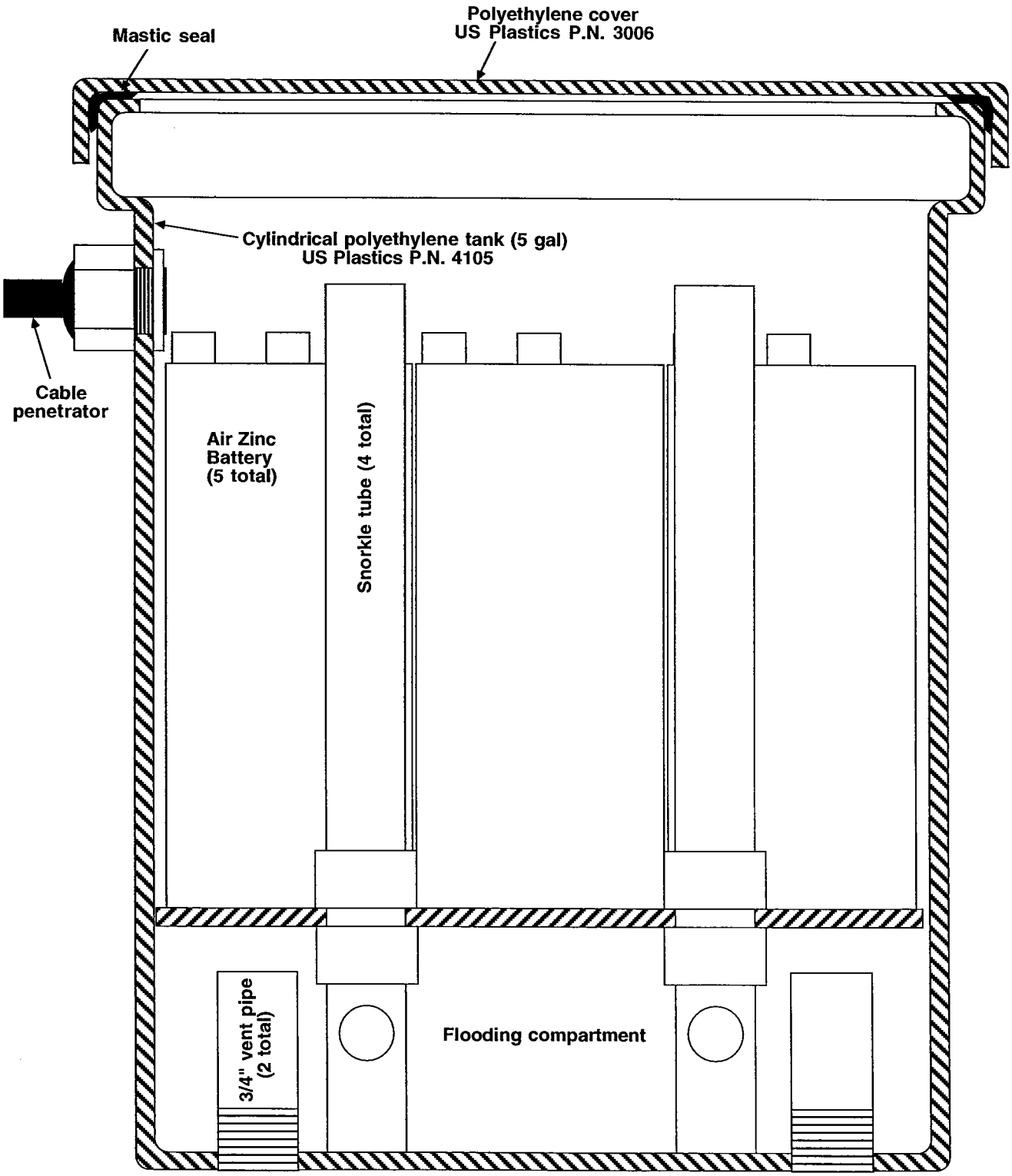
Automatic Power Inc
213 Hutcheson Street, Houston, Texas

OUTLINE DIAGRAM,
FA-249 155mm
MARINE LANTERN

DRAWN BY M.B.	ORIGINATOR K.D.	DRAWING No.
DATE 9/10/70	CHECKED	S-2903-C
API SF 4	APPROVED	

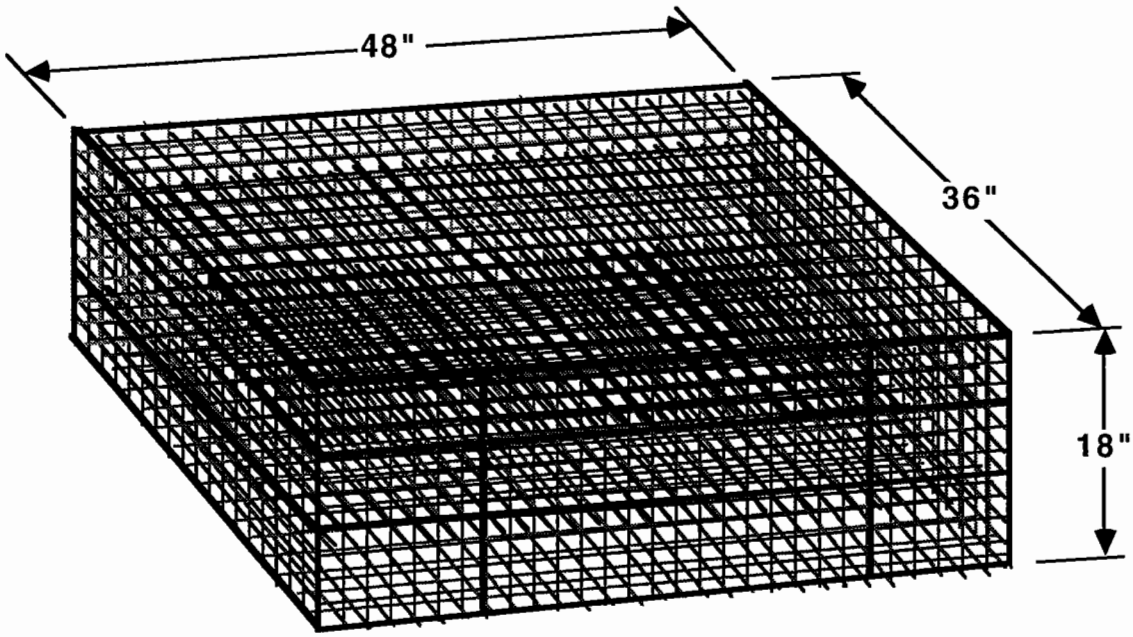
Lighted Buoy Battery Pack

C. Goudey
12-31-96

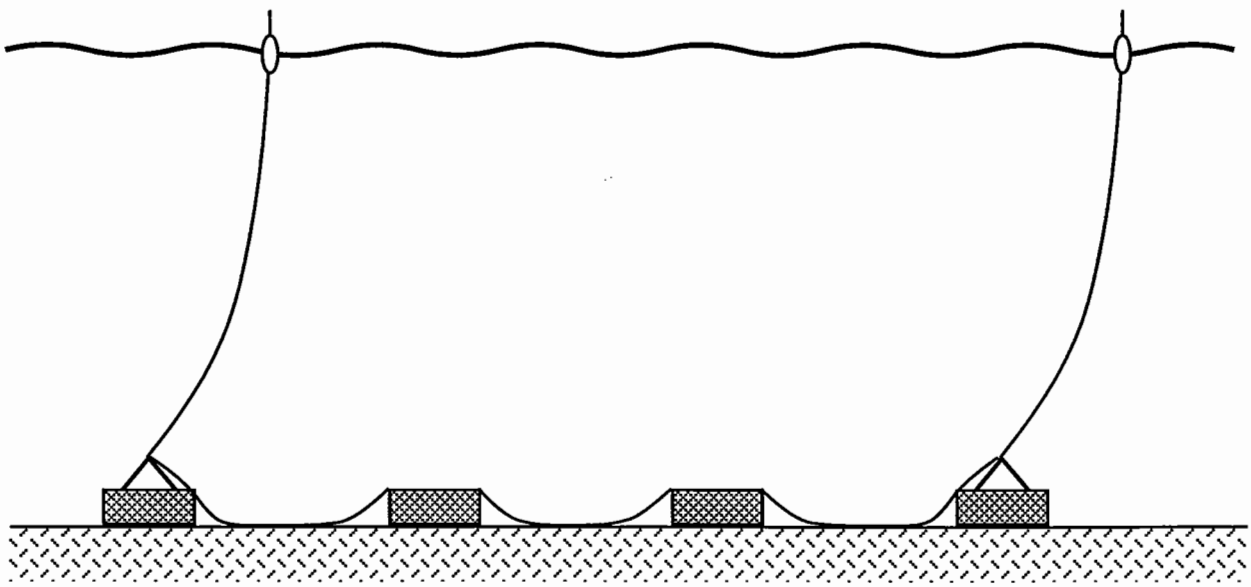


A5

C. Goudey, 5-21-97



Sea scallop bottom grow-out cage.

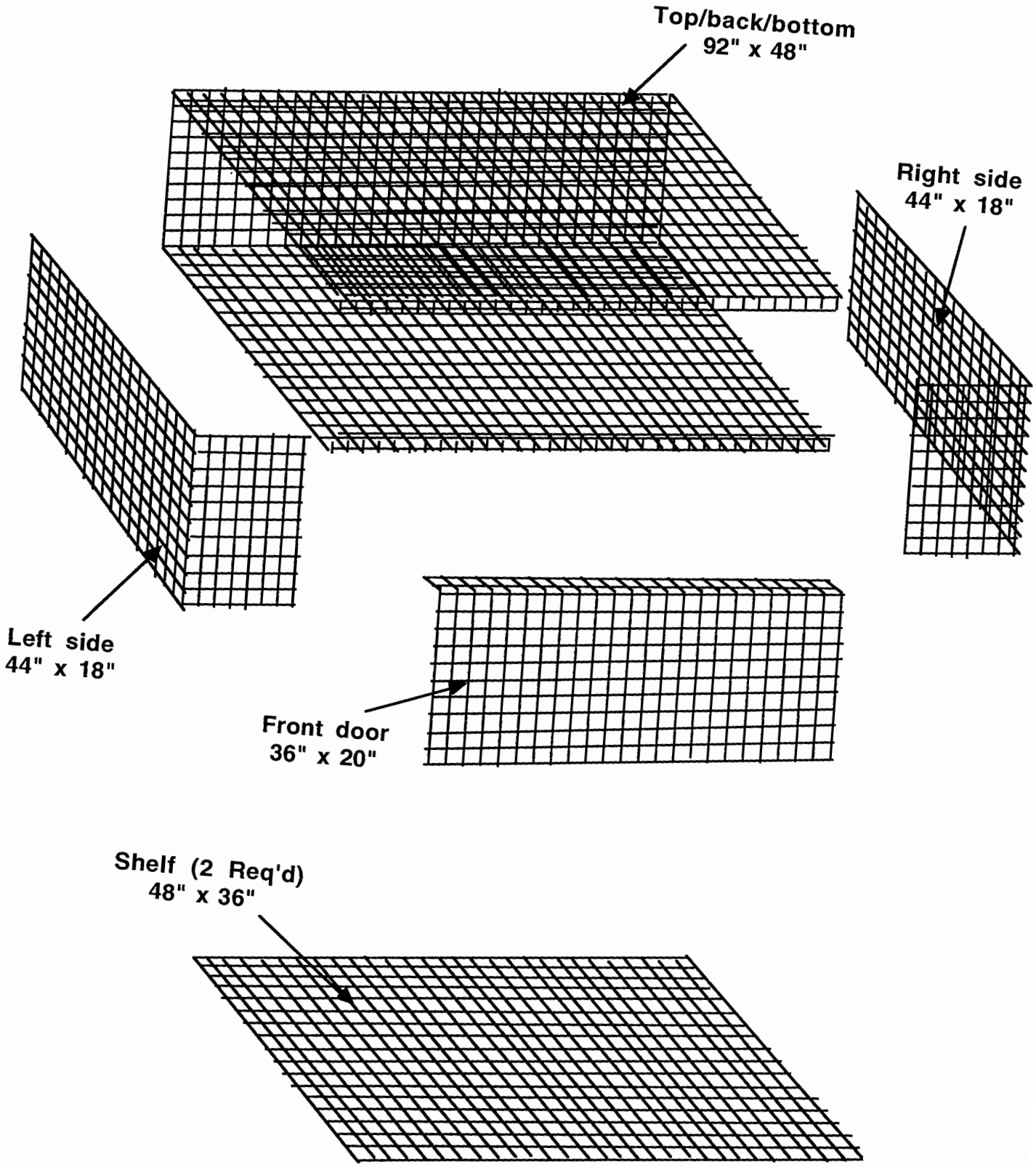


Sea scallop grow-out cage trawl.

Grow-out Cage Parts

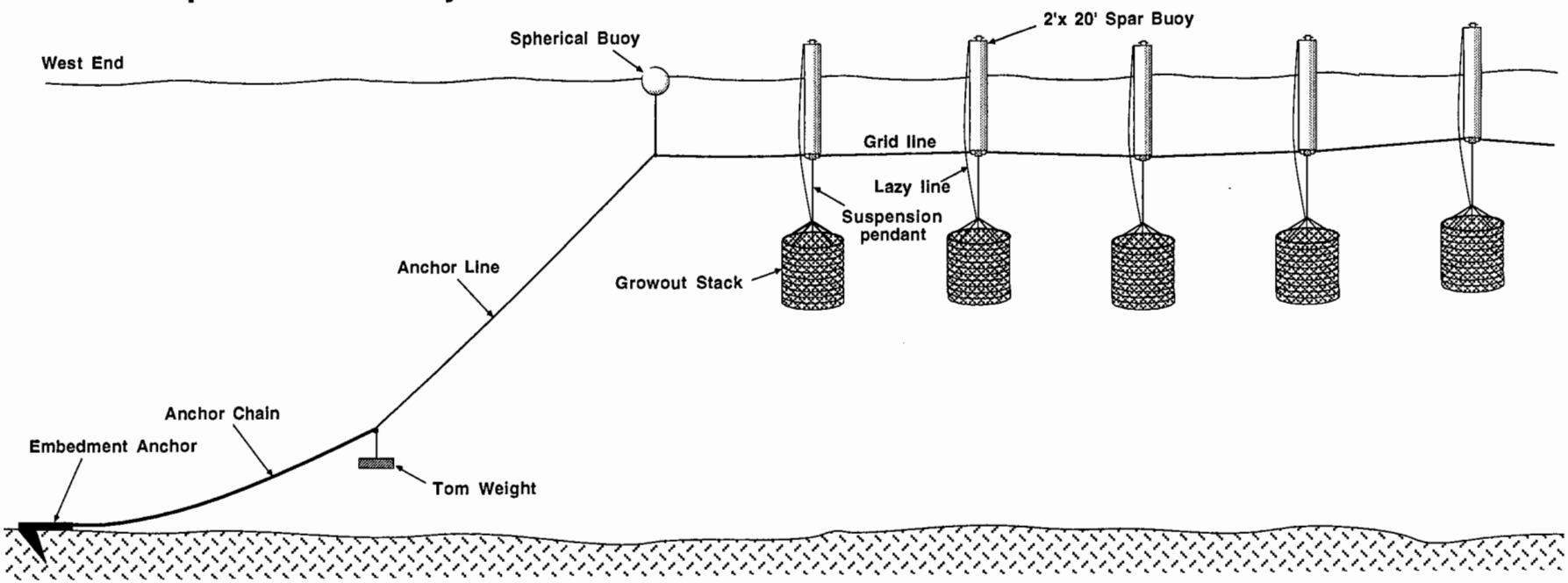
A6

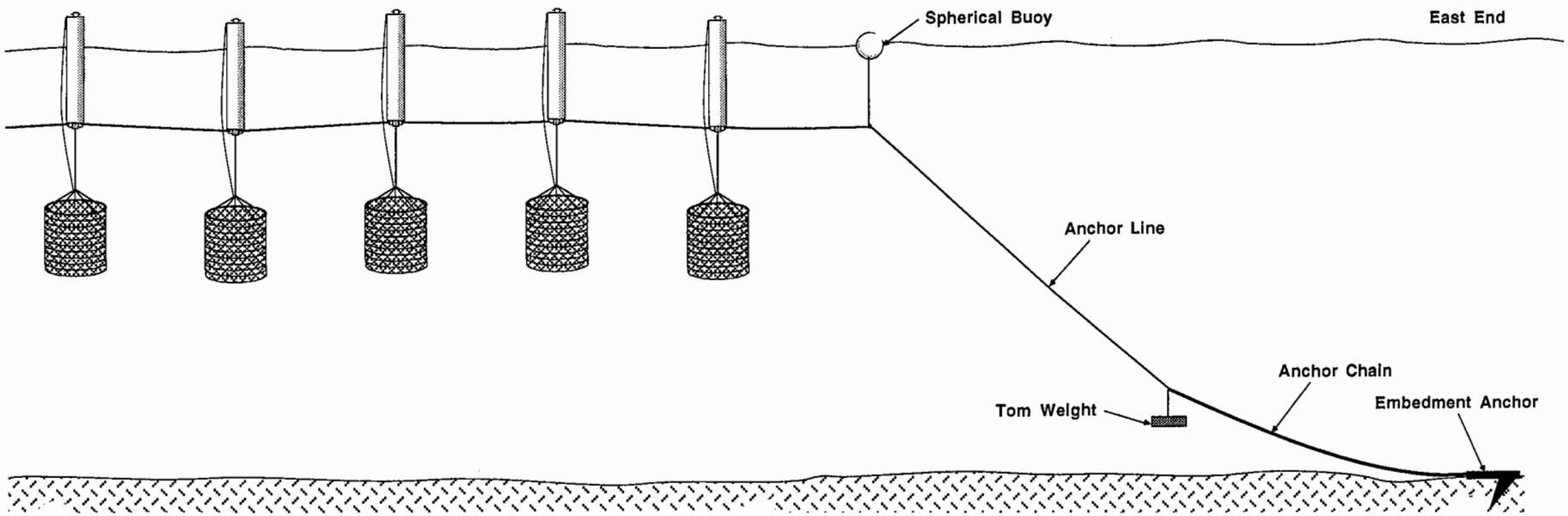
C. Goudey, 5-21-97



Sea Scallop Grow-out Array

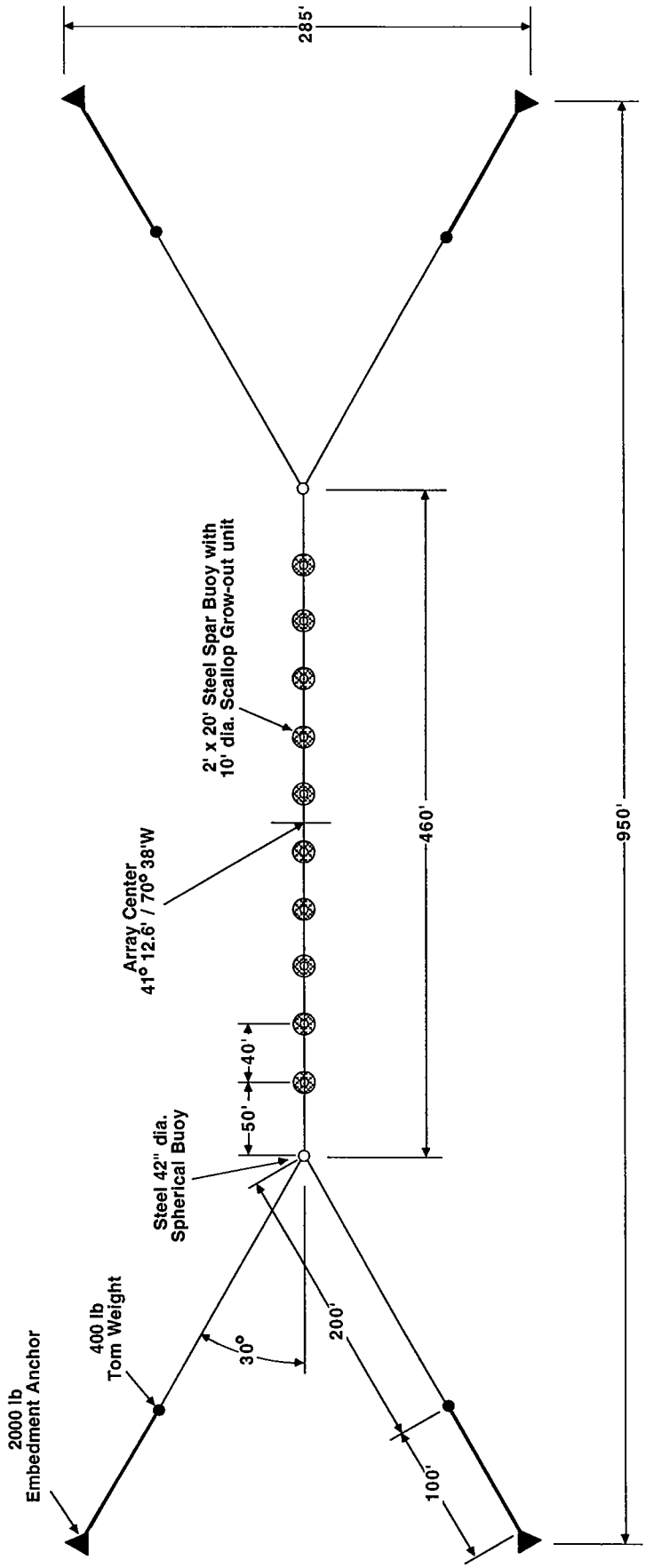
C. Goudey
8-25-94





A8

C . Goudey
8-25-94



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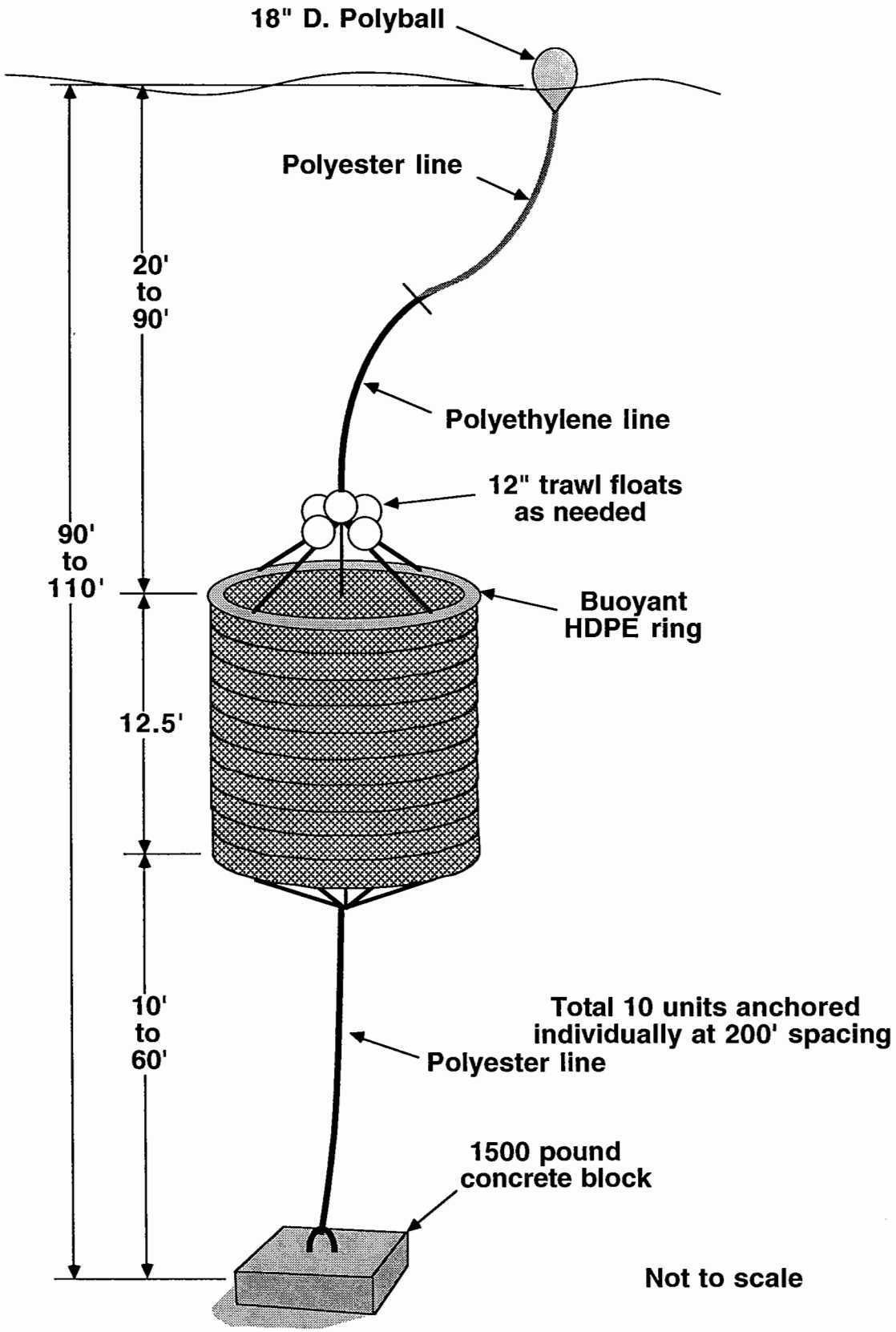
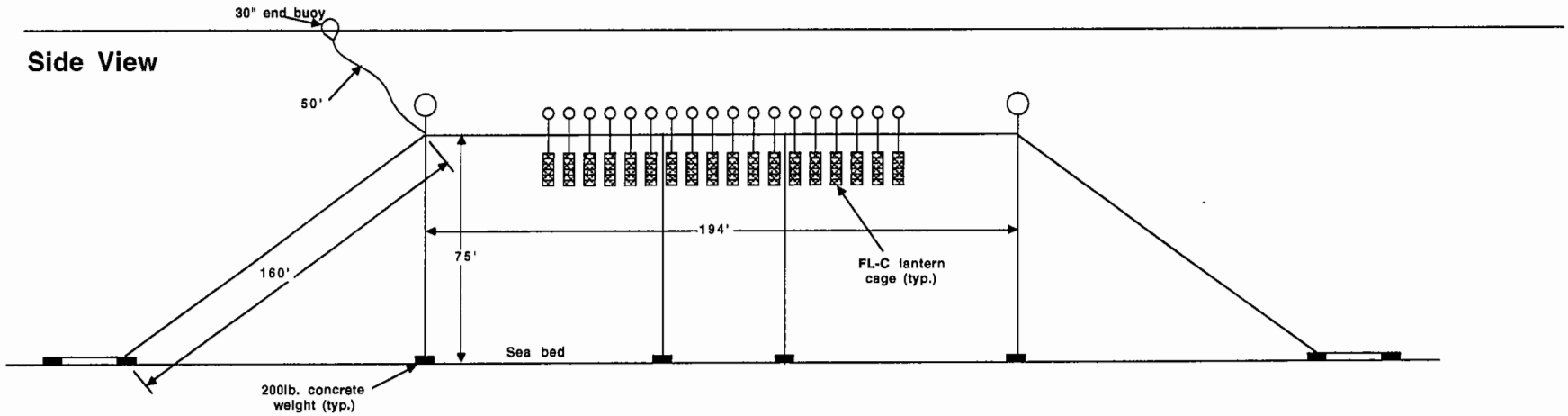
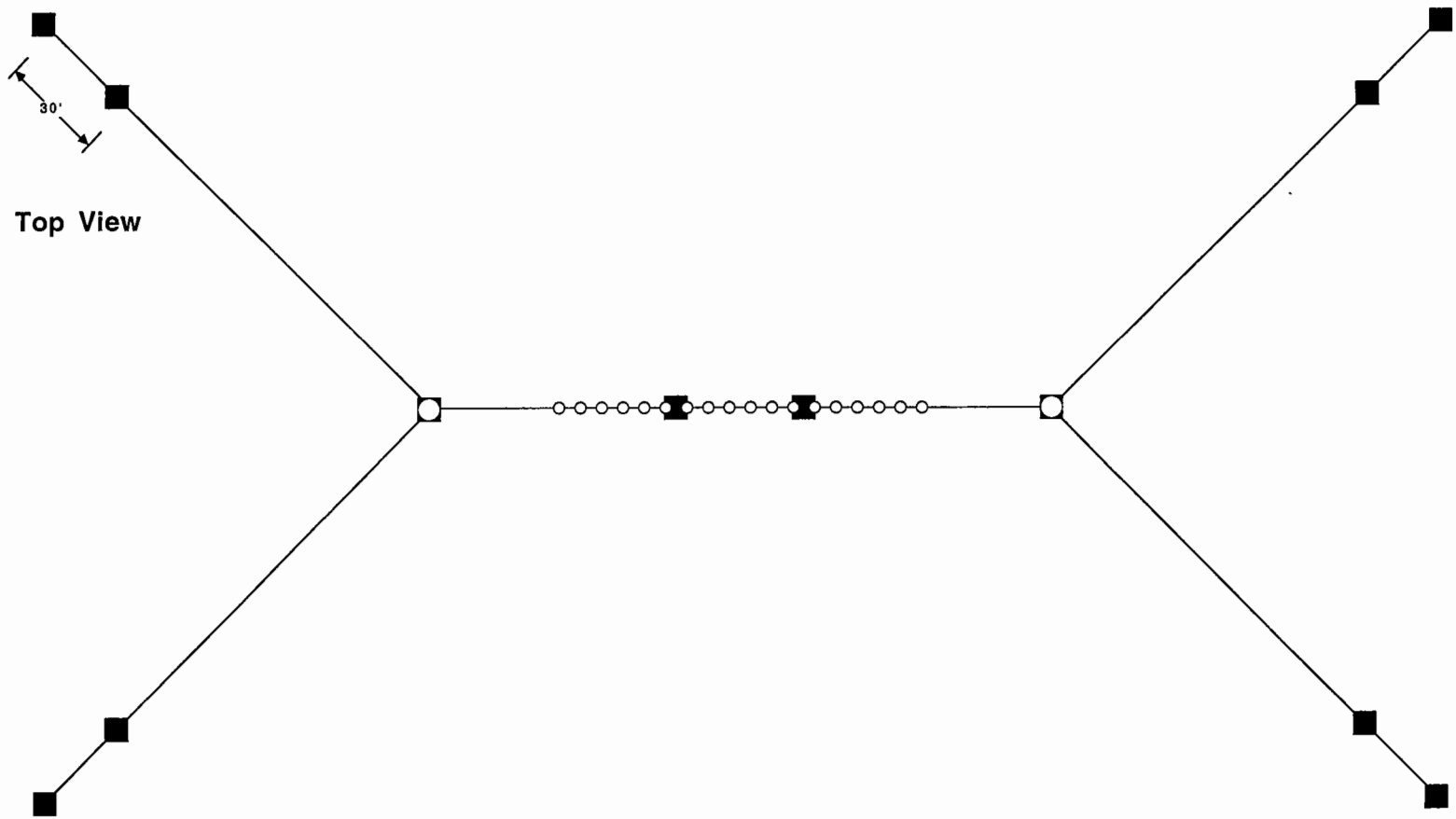


Suspended "super-lantern" grow-out units.

Commercial Lantern Net Array

C. Goudey
1-8-99



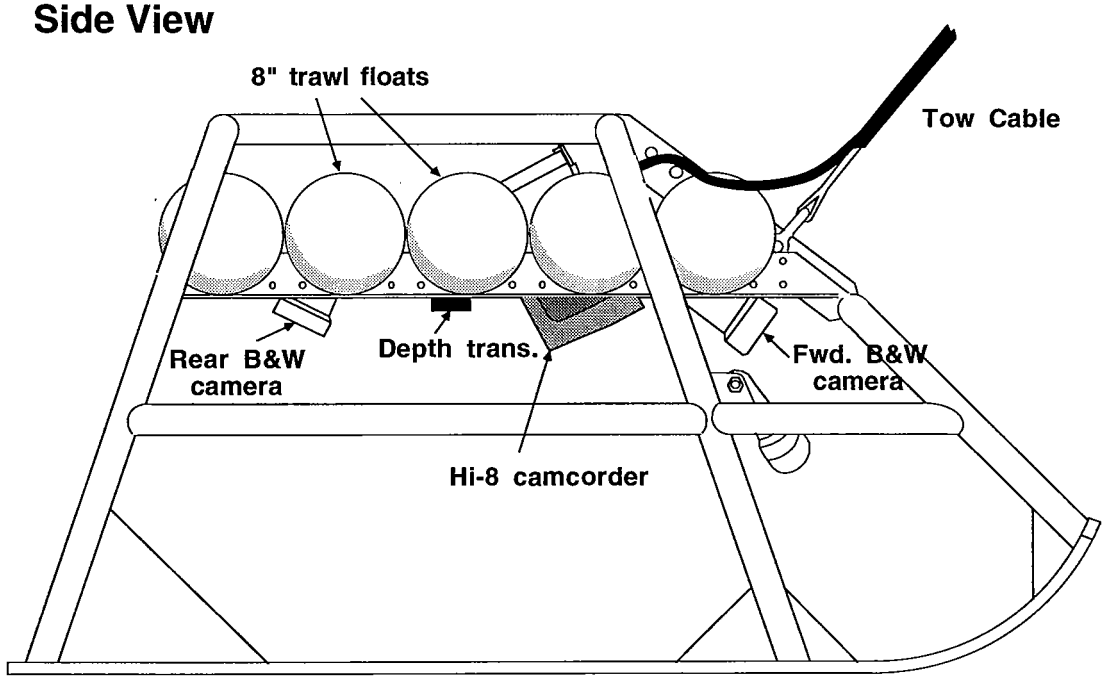


4 of 6

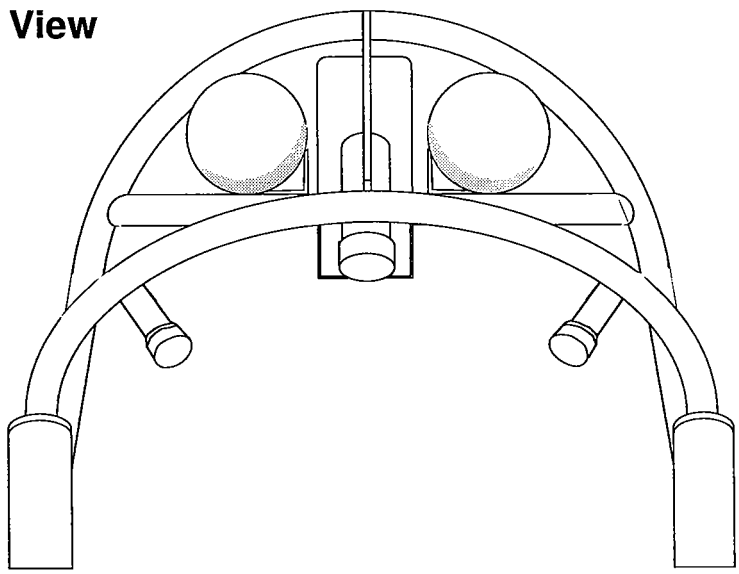
A4

Observation Sled

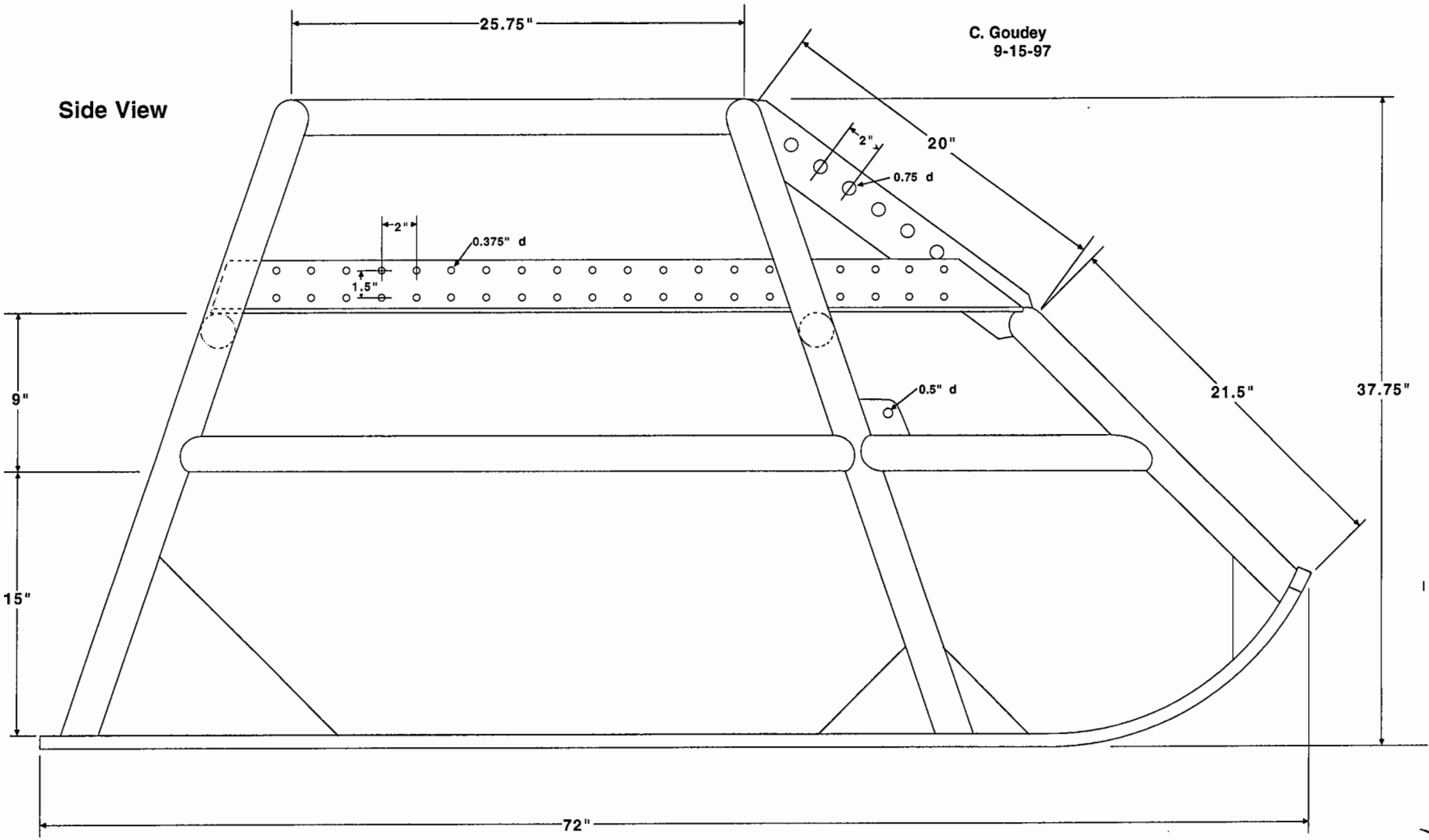
Side View



Front View



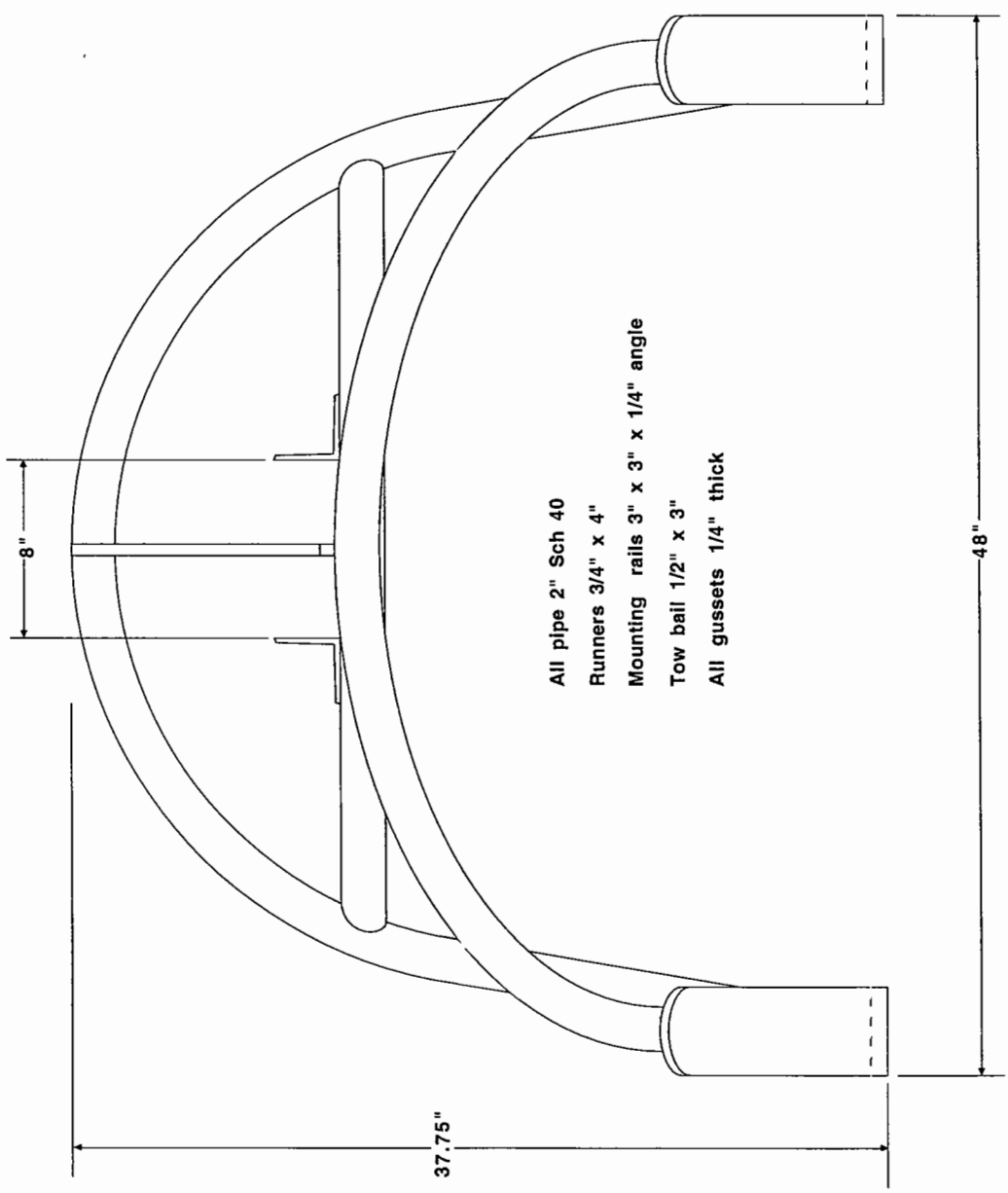
Observation Sled



A12

AB

C. Goudey
9-15-97

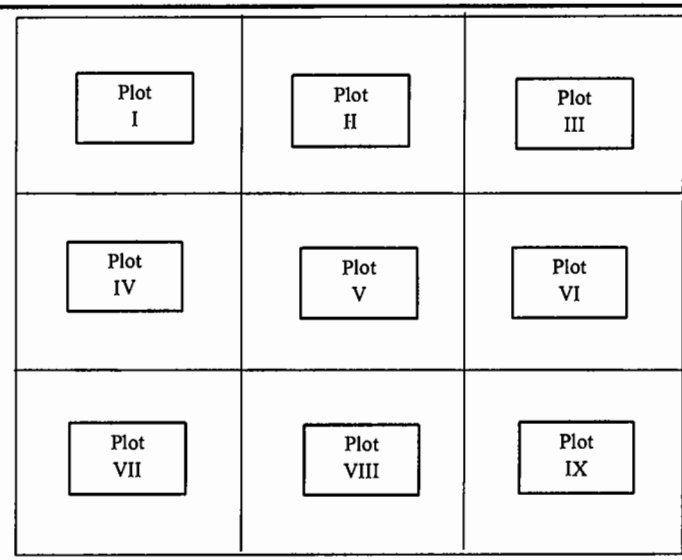


Front View

Table B-1: Schedule of activities addressing the biological studies of the SeaStead sea scallop culture program.										
Date	Site Survey	landed mortality exp't I	landed mortality exp't II	landed mortality exp't III	dredge damage	condition index	wild growth	bottom ranch I	bottom ranch II	bottom cage
Oct-96	*									
19-Mar-97		*								
08-Apr-97			*							
20-21 May 1997	*									
25-26 May 1997				*	*	*		deploy scallops		
01-Aug-97								|		deploy
6 Aug 97 - 4 June 98							*	|		|
26 Aug - 2 Sept					*			|		|
08-Oct-97								|		count 9 cages
04-Jun-98								caught scallops		|
5-6 June 1998									deploy scallops	|
01-Jul-98									|	collect cages
01-Aug-98									caught scallops	

Table B-2: Results of the dredge sample survey to define the habitat within the SeaStead Sea Scallop Culture Site.

Plot	lat/long start	lat/long finish	duration (min)	depth (m)	speed (knots)	area towed (m^2)	Comments:
I (Tow 8)	41 11.27 70 49.18	41 11.30 70 49.75	5	28.35 27.44	4.8	3389	
II (Tow 9)	41 11.62 70 49.53	41 11.77 70 49.28	4.2	27.44	4.3	2543	
III (Tow 10)	41 11.57 70 48.09	41 11.52 70 47.62	5.2	??	4.8	3525	
IV (Tow 7)	41 10.84 70 47.68	41 10.88 70 48.54	5	29.27 28.72	3.8	2683	
V (Tow 6)	41 10.53 70 46.55	41 10.53 70 47.21	5.2	32.20 31.10	4.5	3304	2 large rocks (2-3 foot D) moderate amount of cobble
VI (Tow 5)	41 10.05 70 46.26	41 10.31 70 45.54	5	31.10	4.3	3036	5 boulders (2-3 foot D)
VII (Tow 2)	41 09.04 70 49.73	41 09.49 70 49.49	5	27.44	3.8	2683	
VIII (Tow 3)	41 09.42 70 48.69	41 09.49 70 48.27	5	27.44 28.54	4.1	2895	
IX (Tow 4)	41 09.57 70 47.54	41 09.63 70 47.54	4.3	33.84	4.2	2550	



	PREDATORS				OTHER FAUNA														
Plot	sea-stars	cancer crabs	lobster	gastro-pods	skate	monk-fish	flatfish witch	4-spot	winter	dab	sculpin	red hake	eel-pout	cunner	sand-dollar	sea scallop	horse mussel	other bivalve	anem-one
I (Tow 8)	10	3			11	1	1	6	1	2	2	1	1		6 bu	1			
II (Tow 9)	4	2			2	1	1	1			1	1		2	1 bu				4
III (Tow 10)	100	3			12			6	3	4	2	1			6 bu	2			
IV (Tow 7)	200				9	1				4		1			8 bu	1			
V (Tow 6)	24	41	1	1	20	3		7	2	1	2	8	3		2 bu	9		3	1
VI (Tow 5)	4	35	1		5	2		2	3	1	2				1/2 bu	11		3	
VII (Tow 2)	3	14		1	2	1	6	3		16	1	1			2 bu				
VIII (Tow 3)	70	12			26			3		10		1			4 bu				
IX (Tow 4)	93	34			29	2	10	5	3		1	15	1		6 bu	1	2		

Table B-3: Summary of mortality data collected from first three groups of sea scallops held in the laboratory.					
	Valve depth (mm)	Valve length (mm)	Valve width (mm)	dead (#)	dead (#)
19-Mar-97				18-Apr-97	
MEAN	85.92	83.39	22.08	(ET = 30 days)	
STD	6.89	7.24	2.82		
n	170			7	
			% dead	4.12%	
08-Apr-97				28-Apr-97	
MEAN	98.45	96.12	27.27	(ET = 20 days)	
STD	8.57	9.02	3.72		
n	200			17	
			% dead	8.50%	
26-May-97				04-Jun-97	10-Jun-97
MEAN	70.71	n/a	n/a	(ET = 9 days)	(ET = 15 days)
STD	9.15	n/a	n/a		
n	213			37	123
			% dead	17.37%	57.75%

A17

Table B-4a: An assessment of the mortality of sea scallops damaged during harvest.				
condition	n	% of total	% of dead	% of damaged
26-May-97				
undamaged	194	91.08%		
valve cracked	6	2.82%		
hinge broken	13	6.10%		
sum - damaged	19	8.92%		
04-Jun-97				
total dead	37	17.37%		
previously damaged	17	7.98%	45.95%	89.47%
undamaged	20	9.39%	54.05%	
10-Jun-97				
total dead	123	57.75%		
previously damaged	19	8.92%	15.45%	100.00%
undamaged	104	48.83%	84.55%	

Table B-4b: Average size of landed sea scallop population and the subset of damaged and dead sea scallops from the landed population.				
condition	n	mean valve size (mm)	standard deviation	
total population	211	70.71	9.15	
living after 15 days	80	68.65	9.86	
damaged	19	69.32	10.63	
dead	134	71.95	8.50	

Table B-5: Evaluation of damaged scallops retrieved in an eight foot dredge during a NOAA sea scallop research cruise (26 Aug. to 2 Sept. 1997).				
Sample Tow #	total catch	total sampled	# damaged	% damaged
1	119	119	3	2.52%
2	185	185	4	2.16%
3	200	200	15	7.50%
4	355	355	20	5.63%
5	3511	1891	30	1.59%
6	841	841	10	1.19%
7	619	619	17	2.75%
8	76	76	16	21.05%
13	90	90	8	8.89%
14	240	240	41	17.08%
15	152	152	39	25.66%
16	230	230	46	20.00%
mean	551.5	416.5	20.8	9.67%
stdev	959.6	517.6	14.8	8.85%

A19

Table B-6: A summary of the parameters measured to investigate indices of physiological condition (26 May 1997).

Mean ± Std Dev				
L (mm)	W (mm)	D (mm)		live weight (g)
64.2 12.6	66.6 12.1	14.5 3.6		41.388 19.518
wet soft (g)	wet meat (g)	wet gonad (g)	wet viscera (g)	wet shell (g)
19.991 9.876	8.101 3.284	3.275 1.440	9.683 4.056	21.361 9.751
calc. dry soft (g)	dry meat (g)	dry gonad (g)	dry viscera (g)	dry shell (g)
2.897 1.573	1.447 0.767	0.359 0.331	1.092 0.514	20.226 9.082
soft %DM	meat %DM	gonad %DM	viscera %DM	
14.15% 1.59%	16.96% 2.92%	8.88% 5.08%	11.03% 1.31%	
	wet meat - wet soft ratio	wet gonad - wet soft ratio		
	42.84% 6.35%	17.31% 3.27%		
	dry meat - dry soft ratio	dry gonad - dry soft ratio		dry soft - shell wt ratio * 100
	50.44% 3.12%	10.18% 5.12%		13.79 3.18

Table B-7: An estimate of sea scallop growth at two sites when left undisturbed.							
tow	NOAA 9705-0239	SeaStead unlined	NOAA 9705-240	SeaStead unlined	all data		
date	06-Aug-97	04-Jun-98	06-Aug-97	04-Jun-98	06-Aug-97	04-Jun-98	change in
location							
start	40° 41.32 69°09.44	40°41.38 69°09.41	40°43.98 69°18.14	40°43.96 69°18.05			
finish	40°41.71 69°10.56	40°41.75 69°10.52	40°44.59 69°17.25	40°44.57 69°17.75			
	Valve Depth (mm)	Valve Depth (mm)	Valve Depth (mm)	Valve Depth (mm)	Valve Depth (mm)	Valve Depth (mm)	Valve Depth (mm)
mean	65.4	97.5	63.3	95.1	64.0	96.4	32.3
stdev	5.2	4.8	6.8	4.6	6.3	4.8	
n	79	134	126	116	205	250	
			calculated meat weight (g		8.35	14.74	6.4
			calculated meat count/lb		54	31	

A21

Table B-8: The size frequency distribution and mean valve depth of two bottom ranching experiments at the SeaStead Scallop Culture Site.

	Bottom Ranching I				Bottom Ranching II			
	dumped 61 bushel on 26 May 1997				dumped 500 bushel on 5 June 98			
	deployed: 5/26/97		retrieved: 6/4/98		deployed: 6/05/98		retrieved: 8/02/98	
	start	finish	start	finish	start	finish	start	finish
LORAN	14263.2	14264.3	14262.2	14262.5	14267.0	14264.0	14262.1	14267.0
	43821.7	43820.8	43823.5	43821.8	43821.0	43821.2	43821.5	43821.0
time	0700h	0710h	1220h	1238h	1335h	1410h	0555h	0605h
depth	15 fathom		15 fathom		15 fathom		15 fathom	

Size distribution of deployed and retrieved scallops

Valve Depth (mm)	26-May-97 deployed	04-Jun-98 retrieved	05-Jun-98 deployed	02-Aug-98 retrieved
35	1	0	0	0
40	3	0	0	0
45	12	0	0	0
50	27	0	2	0
55	22	0	0	0
60	35	0	0	0
65	76	0	0	0
70	174	0	0	0
75	159	1	0	0
80	84	2	1	0
85	14	2	1	4
90	10	1	10	17
95	1	2	24	27
100	1	1	21	22
105	0	0	9	2
110	0	1	5	2
115	0	0	9	0
120	0	0	26	11
125	0	0	20	11
130	0	0	1	5
135	0	0	0	6
140	0	0	2	4
>145	0	0	0	1
count	619	10	131	112
mean	70.1	89.5	107.9	106.4
stdev	9.3	10.7	15.0	16.5
lapsed time		374 days		58 days
calculated meat weight	9.76	13.58	16.51	16.29
calculated meat count	47	33	28	28

Table B-9: Summary of the mortality in cage reared scallops deployed at the SeaStead Site.

deployed 19 Sept. 1997	Retrieved 8 Oct. 1997			Retrieved 01-Jun-98		
	live	dead	% mortality	live	dead	% mortality
String One						
cage 1 - top	19	66	77.65%			
mid	17	54	76.06%			
cage 2 - top	10	65	86.67%			
mid	36	39	52.00%			
cage 3 - top	19	52	73.24%			
mid	21	55	72.37%			
String Two						
cage 17 - top	16	50	75.76%			
mid	2	74	97.37%			
cage 18 - top	39	30	43.48%			
mid	26	48	64.86%			
cage 19 - top	8	61	88.41%			
mid	5	69	93.24%			
String Three						
cage 1 - top	62	52	45.61%			
mid	26	175	87.06%	13	1	7.14%
cage 2 - top	22	93	80.87%			
mid	21	100	82.64%	19	2	9.52%
cage 3 - top	34	97	74.05%			
mid	38	80	67.80%			
cage 8				31	97	75.78%
cage 9				12	126	91.30%
cage 10				48	88	64.71%
cage 11				28	101	78.29%
cage 12				19	117	86.03%
cage 13				14	99	87.61%
cage 14				30	114	79.17%
cage 15				16	128	88.89%
cage 16				27	98	78.40%
cage 17				8	130	94.20%
cage 18				18	136	88.31%
cage 19				9	129	93.48%
Mean mortality			78.18%			
St Dev			13.67%			

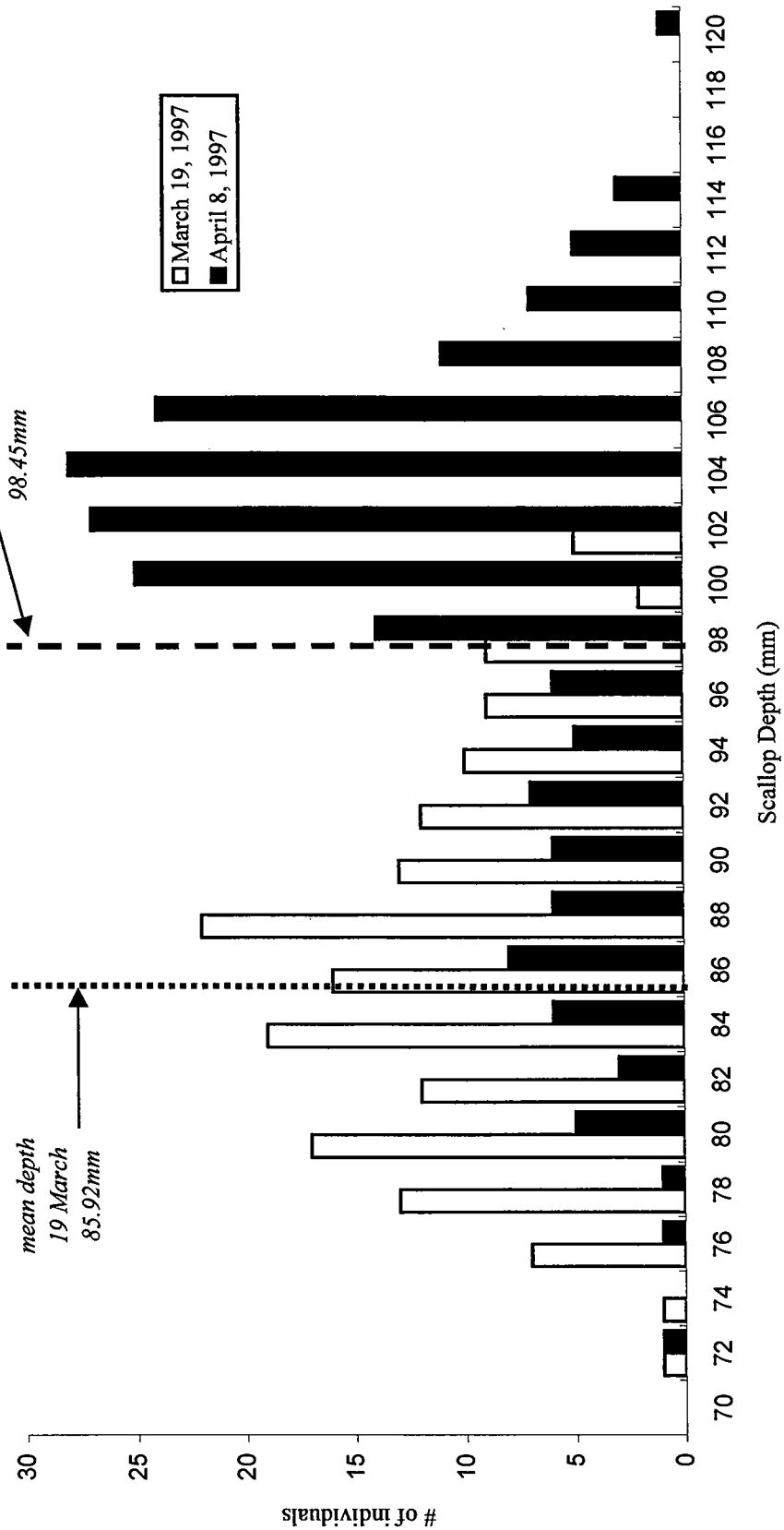
A23

Table B-10: Summary of the growth of caged scallops deployed for 236 days at the		
Valve depth (mm)	08-Oct-97 alive	01-Jun-98 alive
45	0	1
50	1	1
55	9	2
60	27	3
65	112	5
70	126	7
75	70	17
80	6	28
85	0	37
90	2	72
95	0	47
100	0	46
105	0	21
110	0	2
115	0	1
n	353	290
mean	68.5	89.5
stdev	5.4	10.8

A24

Figure B-1: SeaStead Sea Scallop Retrievals

Size distribution of first two collections



A25

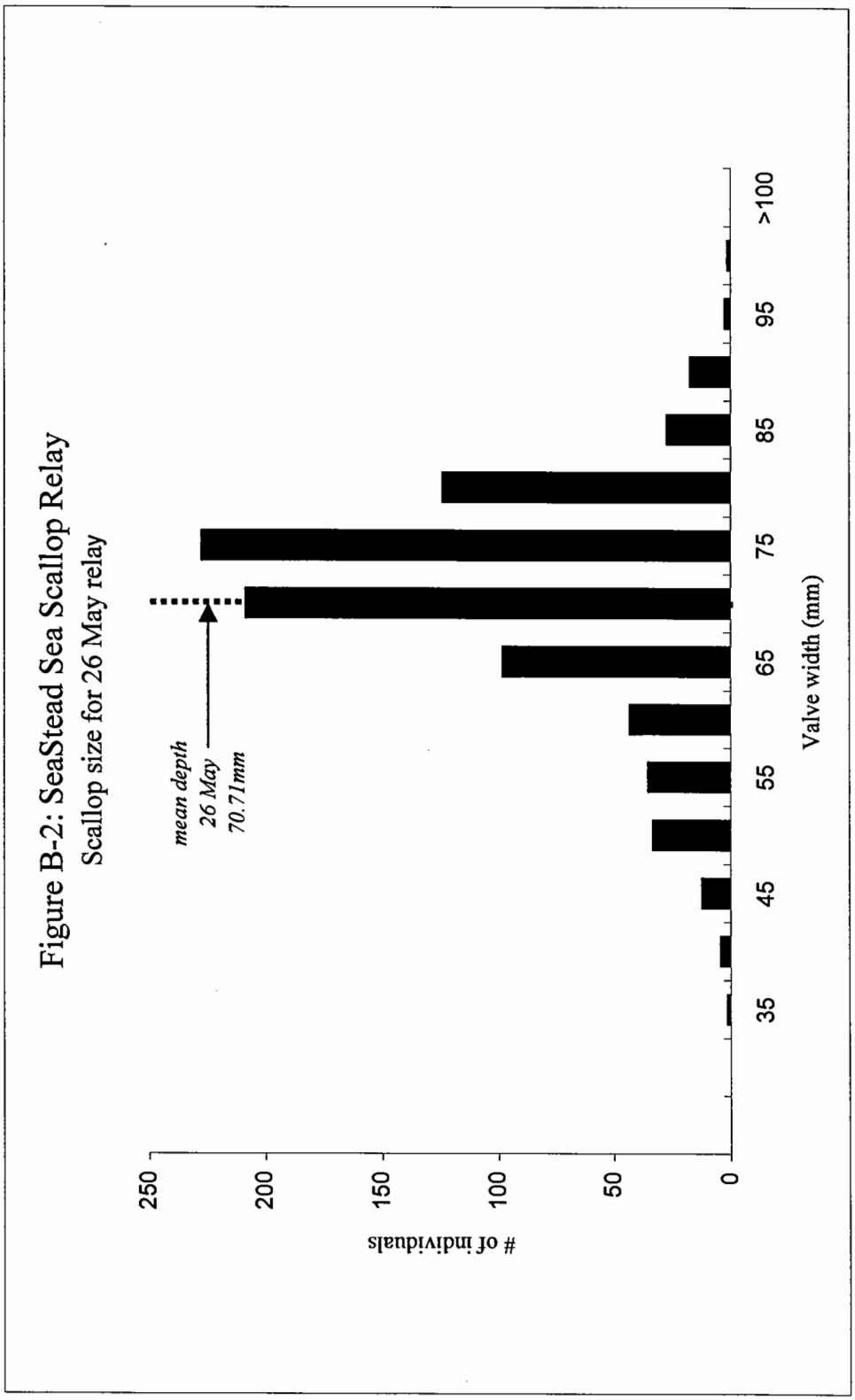
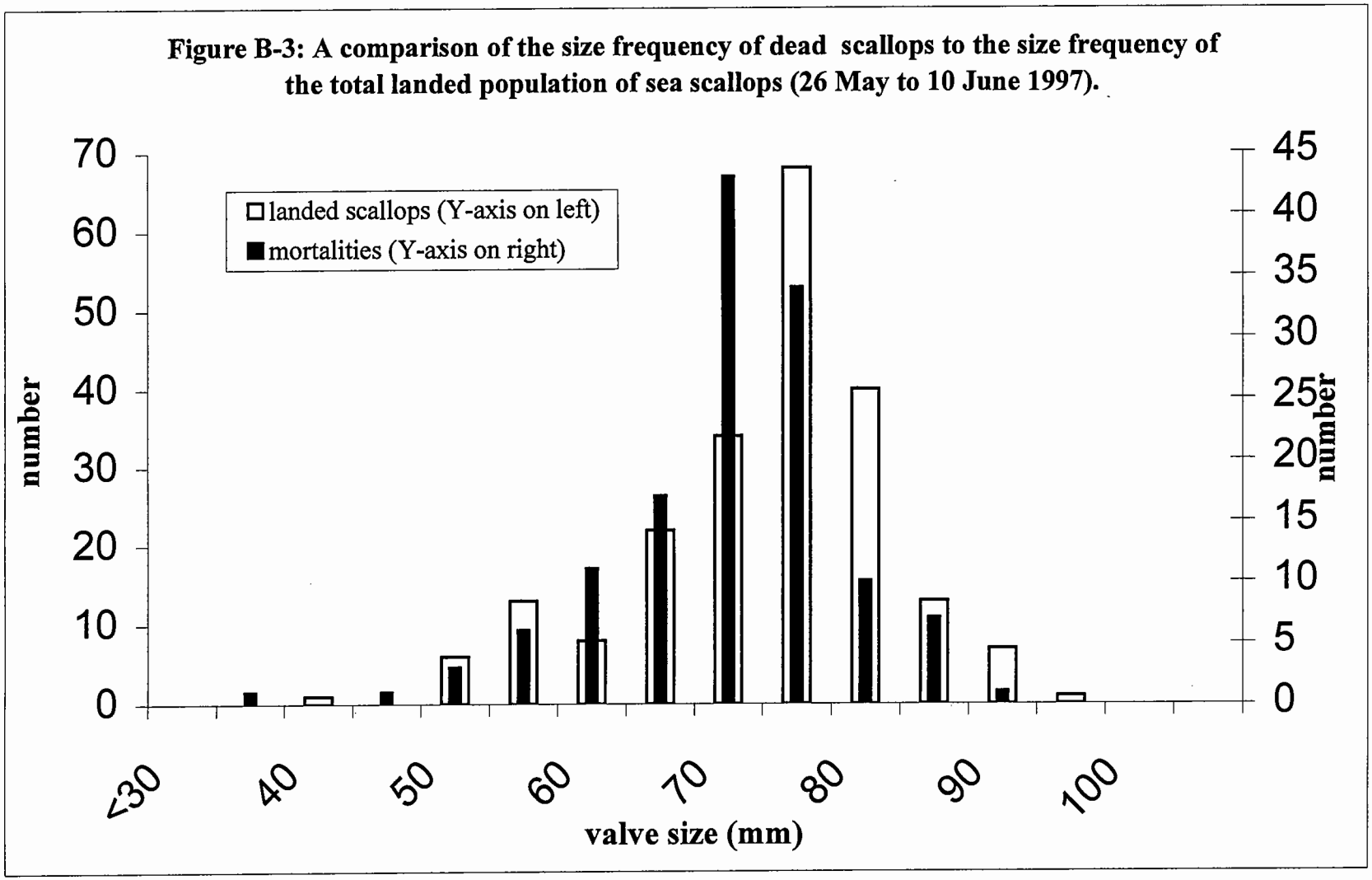


Figure B-2: SeaStead Sea Scallop Relay
Scallop size for 26 May relay
mean depth
26 May
70.71mm
# of individuals
250
200
150
100
50
0
35
45
55
65
75
85
95
>100
Valve width (mm)

Figure B-3: A comparison of the size frequency of dead scallops to the size frequency of the total landed population of sea scallops (26 May to 10 June 1997).



A27

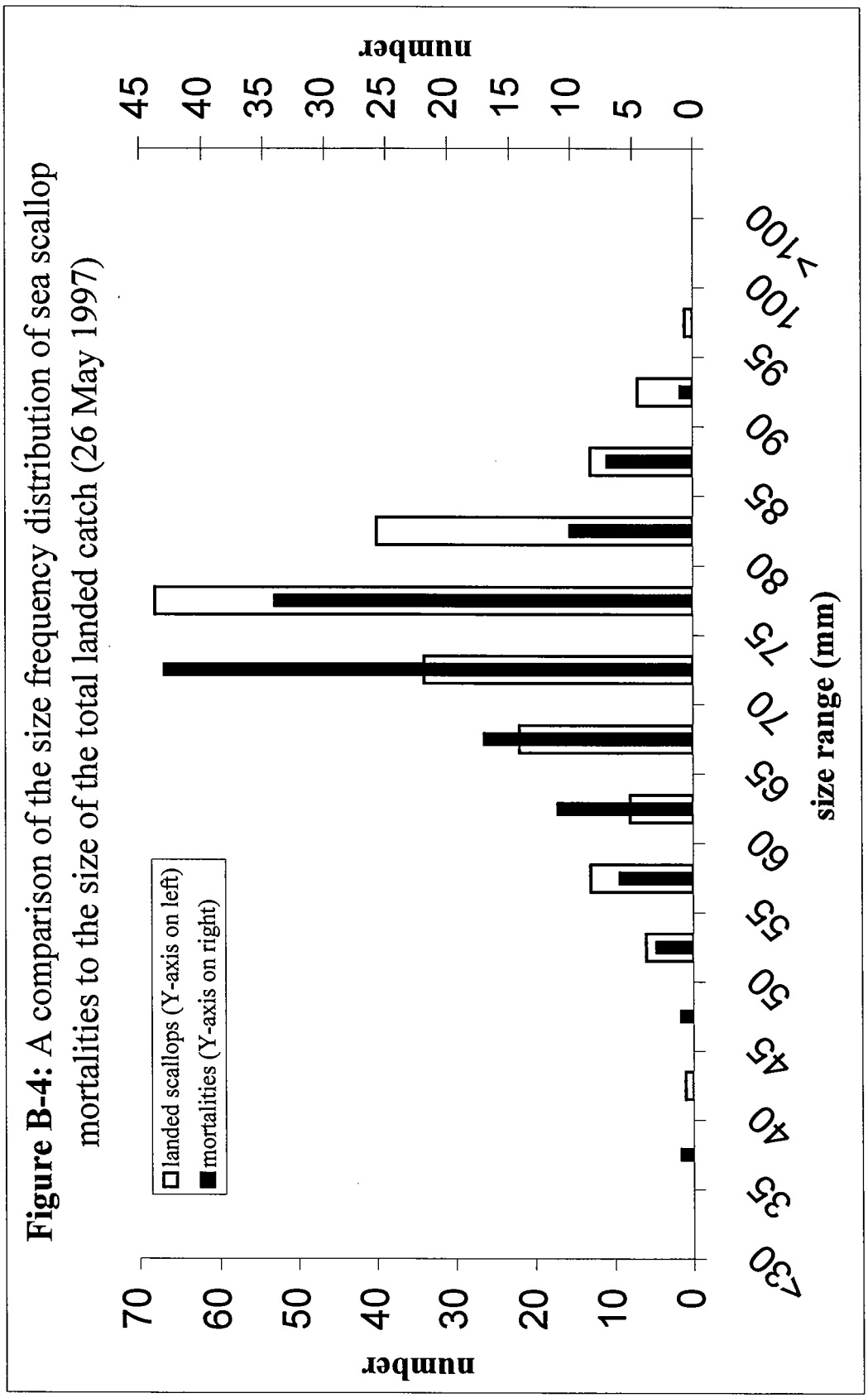


Figure B-4: A comparison of the size frequency distribution of sea scallop mortalities to the size of the total landed catch (26 May 1997)

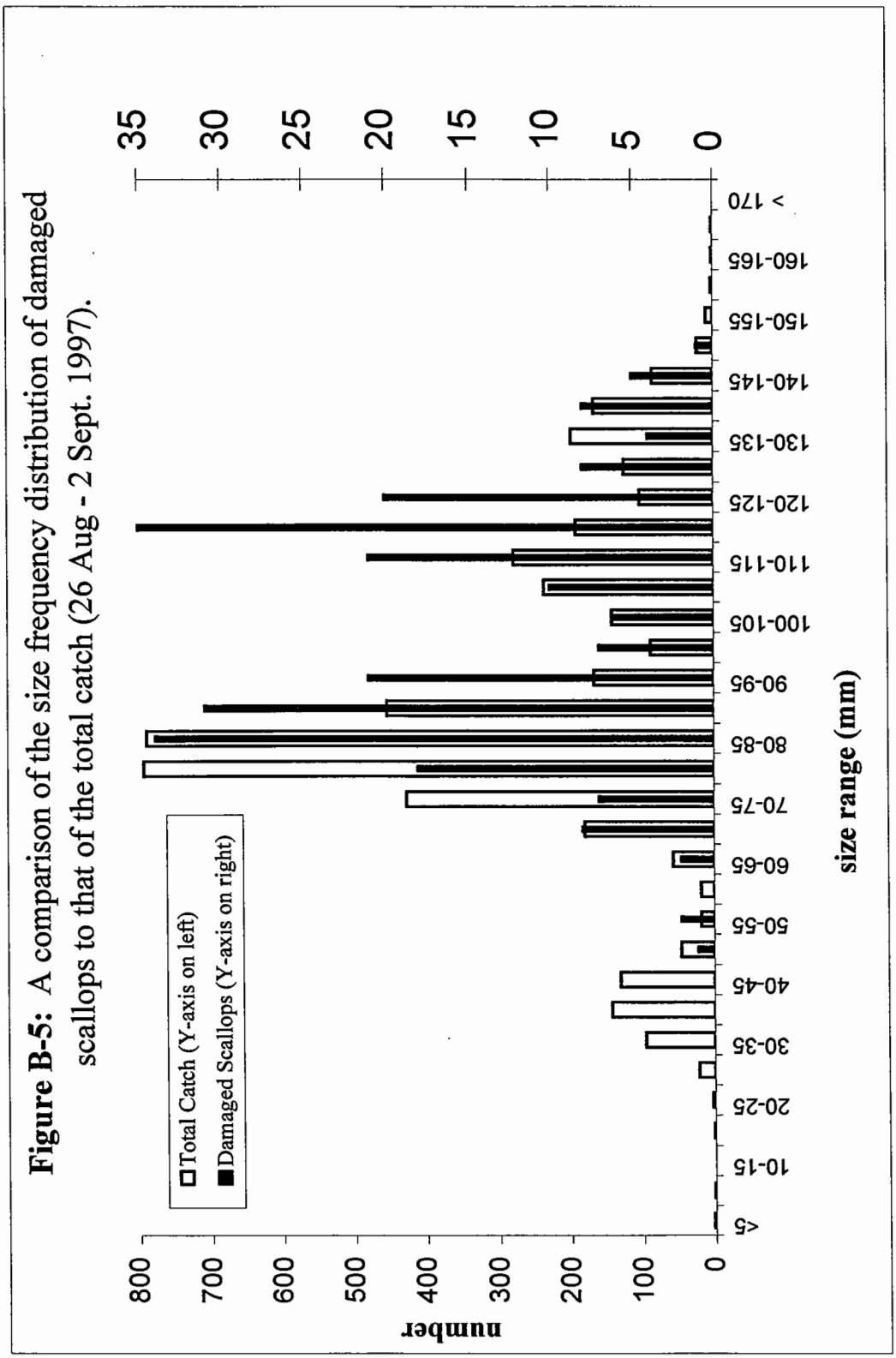


Figure B-5: A comparison of the size frequency distribution of damaged scallops to that of the total catch (26 Aug - 2 Sept. 1997).

A29

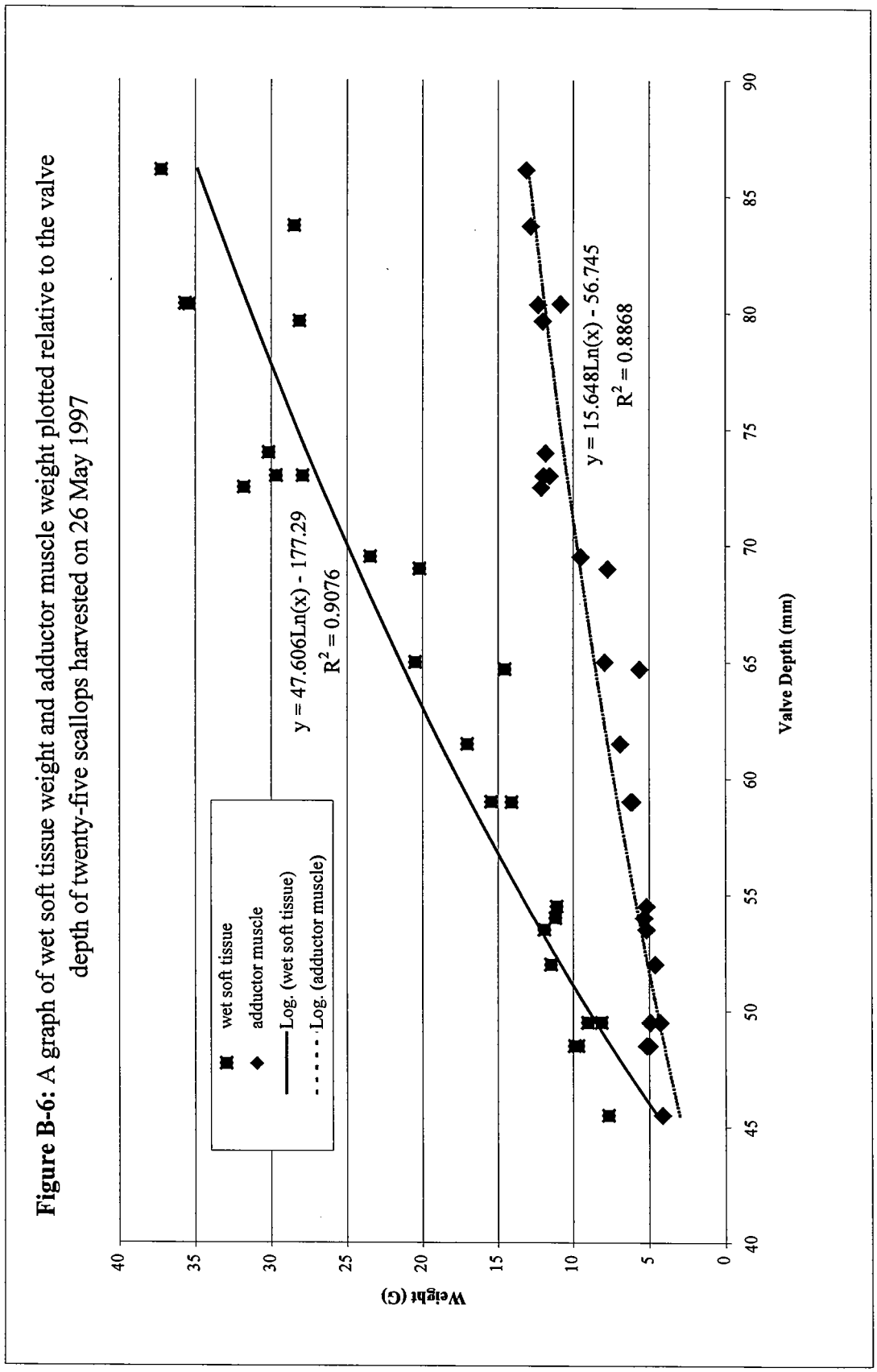


Figure B-6: A graph of wet soft tissue weight and adductor muscle weight plotted relative to the valve depth of twenty-five scallops harvested on 26 May 1997

A30

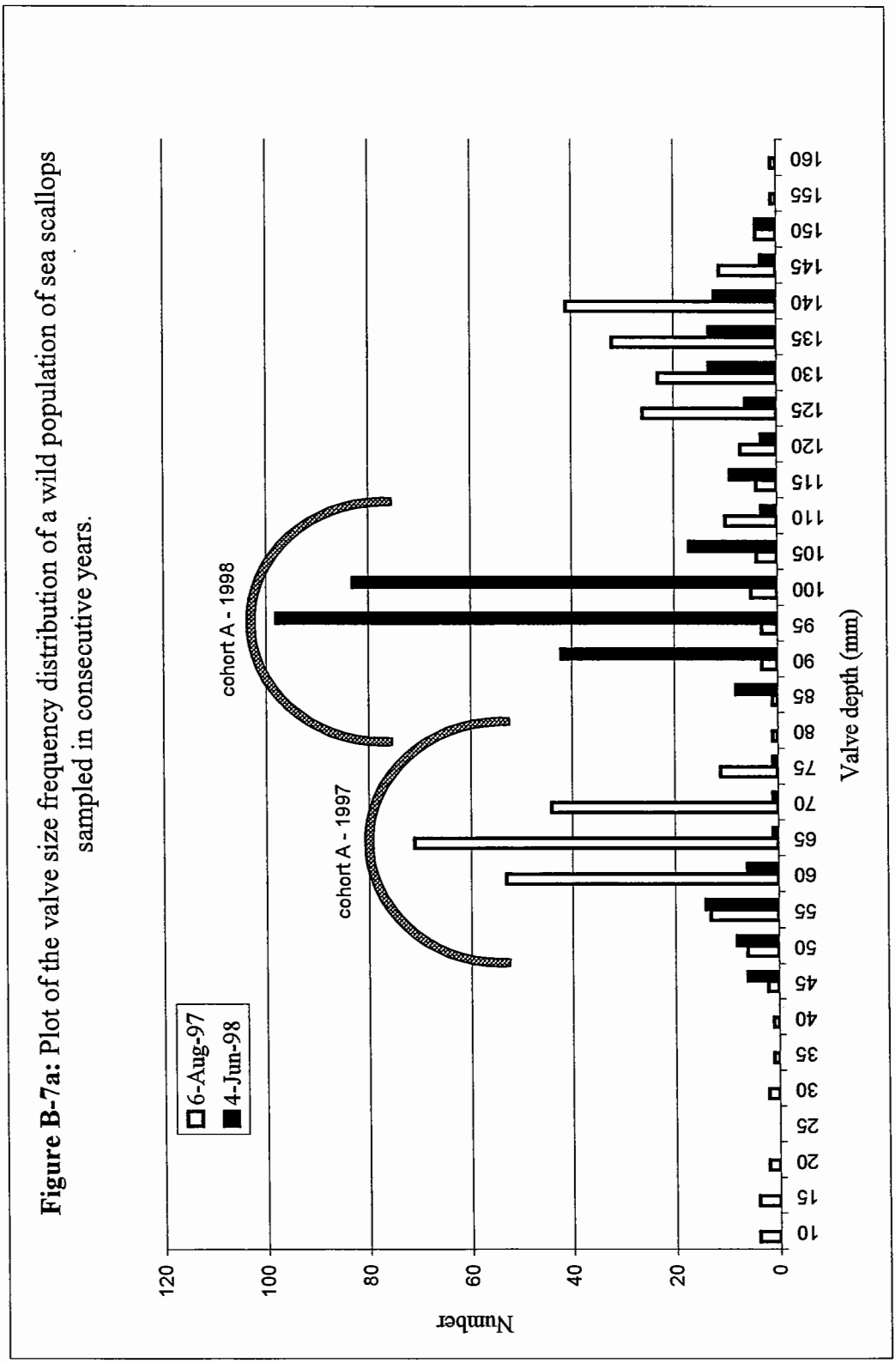


Figure B-7a: Plot of the valve size frequency distribution of a wild population of sea scallops sampled in consecutive years.

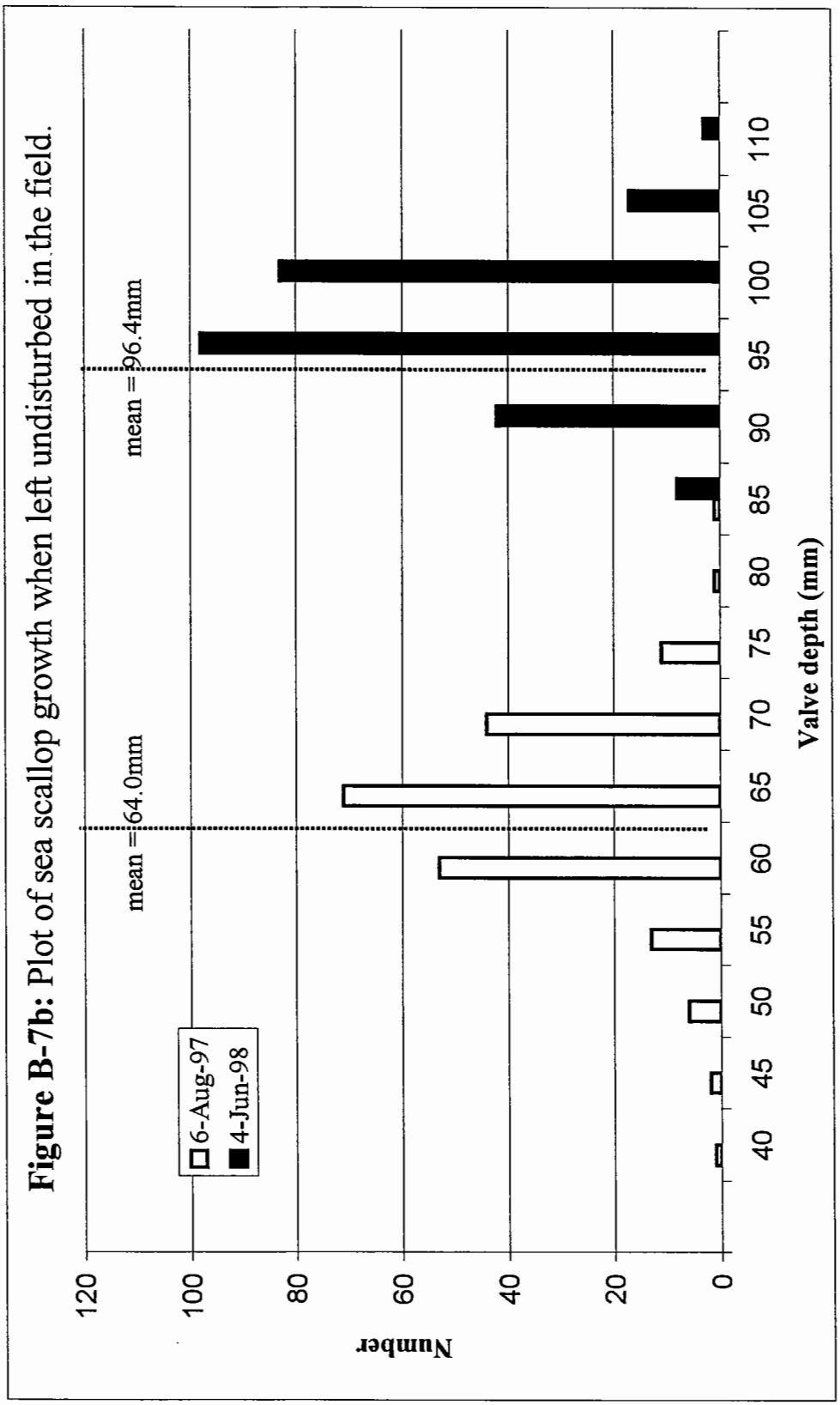


Figure B-7b: Plot of sea scallop growth when left undisturbed in the field.

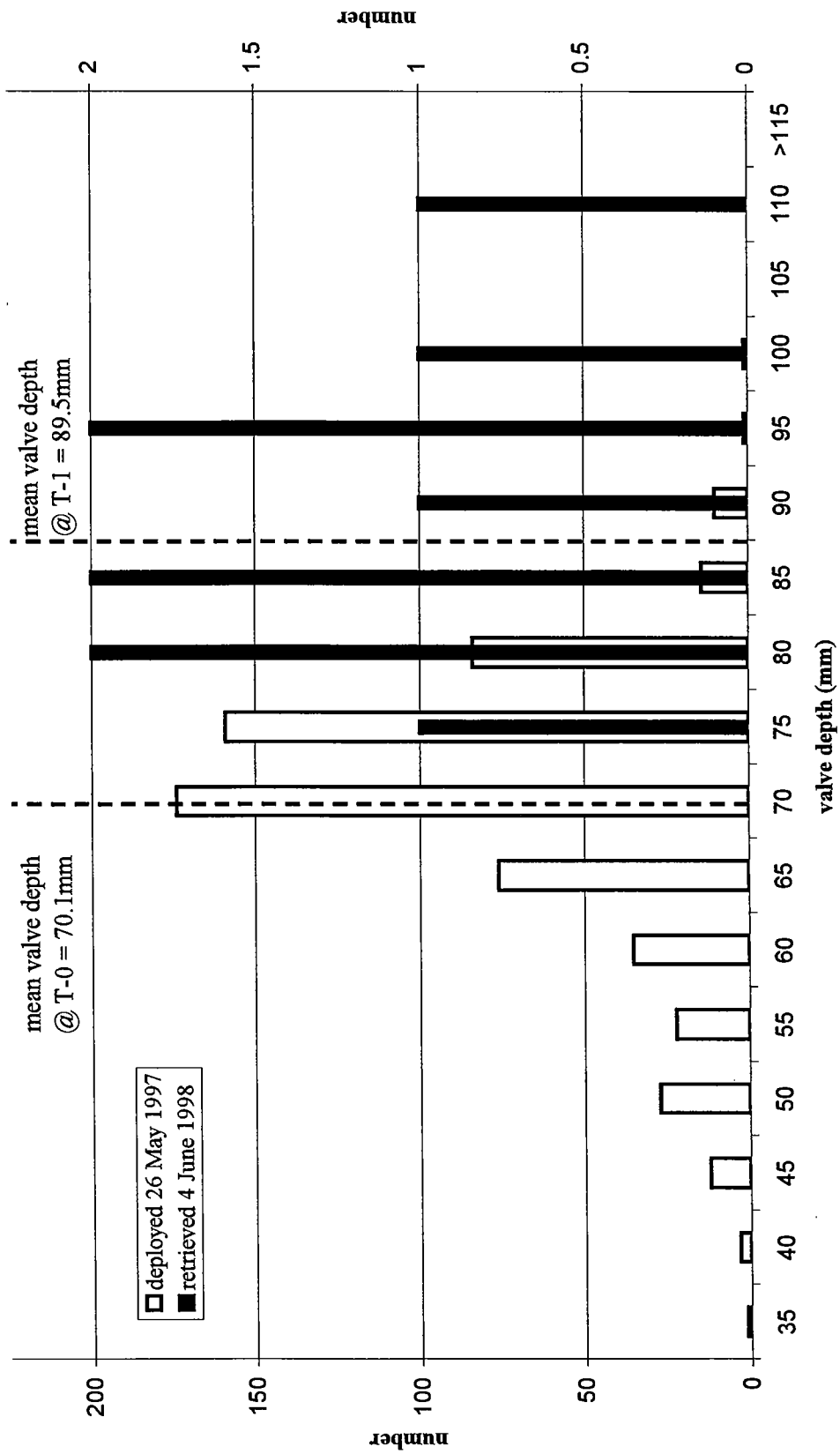


Figure B-8a: Growth of sea scallops from the first bottom ranching deployment at the SeaStead site.

A33

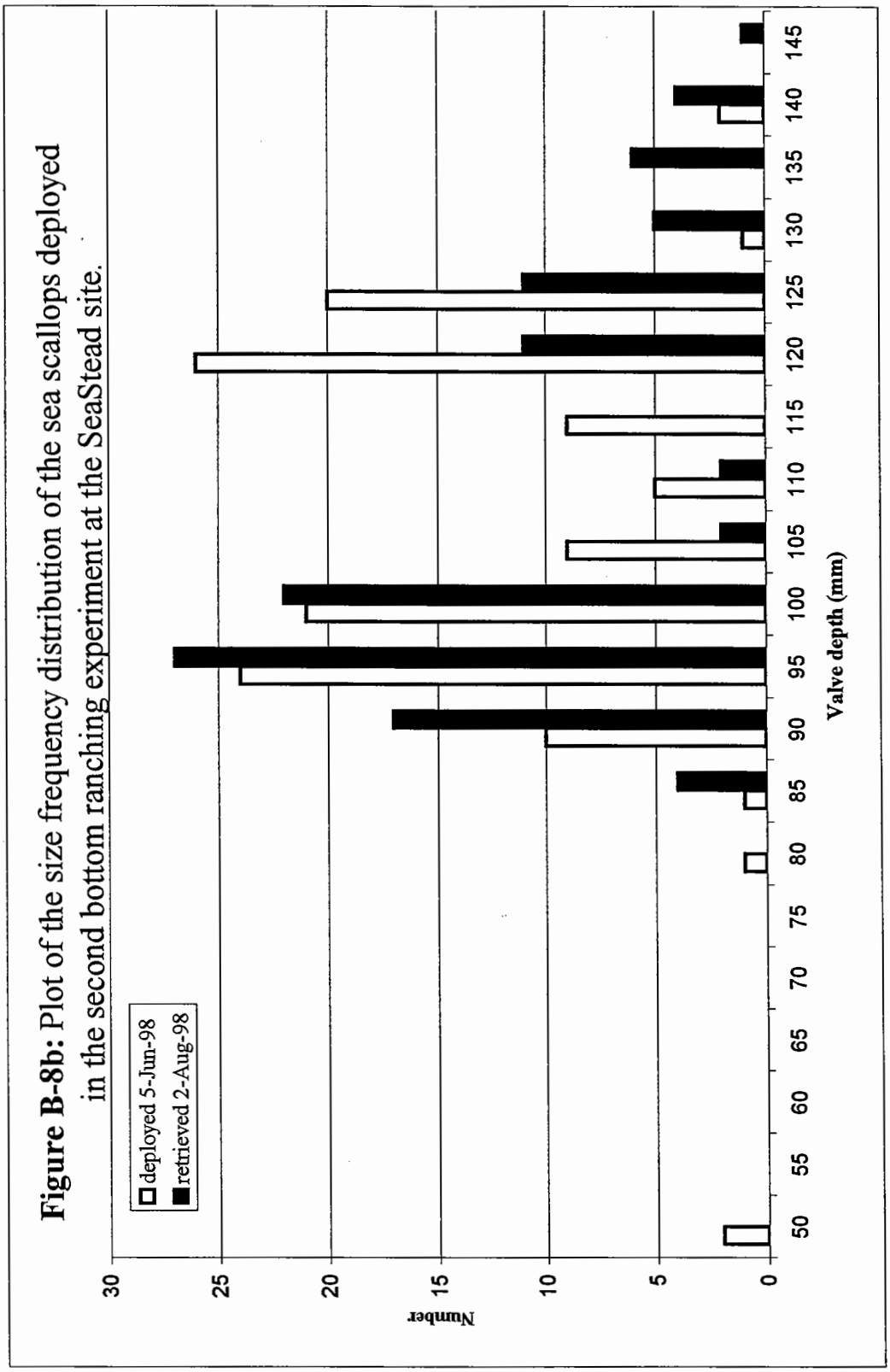


Figure B-8b: Plot of the size frequency distribution of the sea scallops deployed in the second bottom ranching experiment at the SeaStead site.

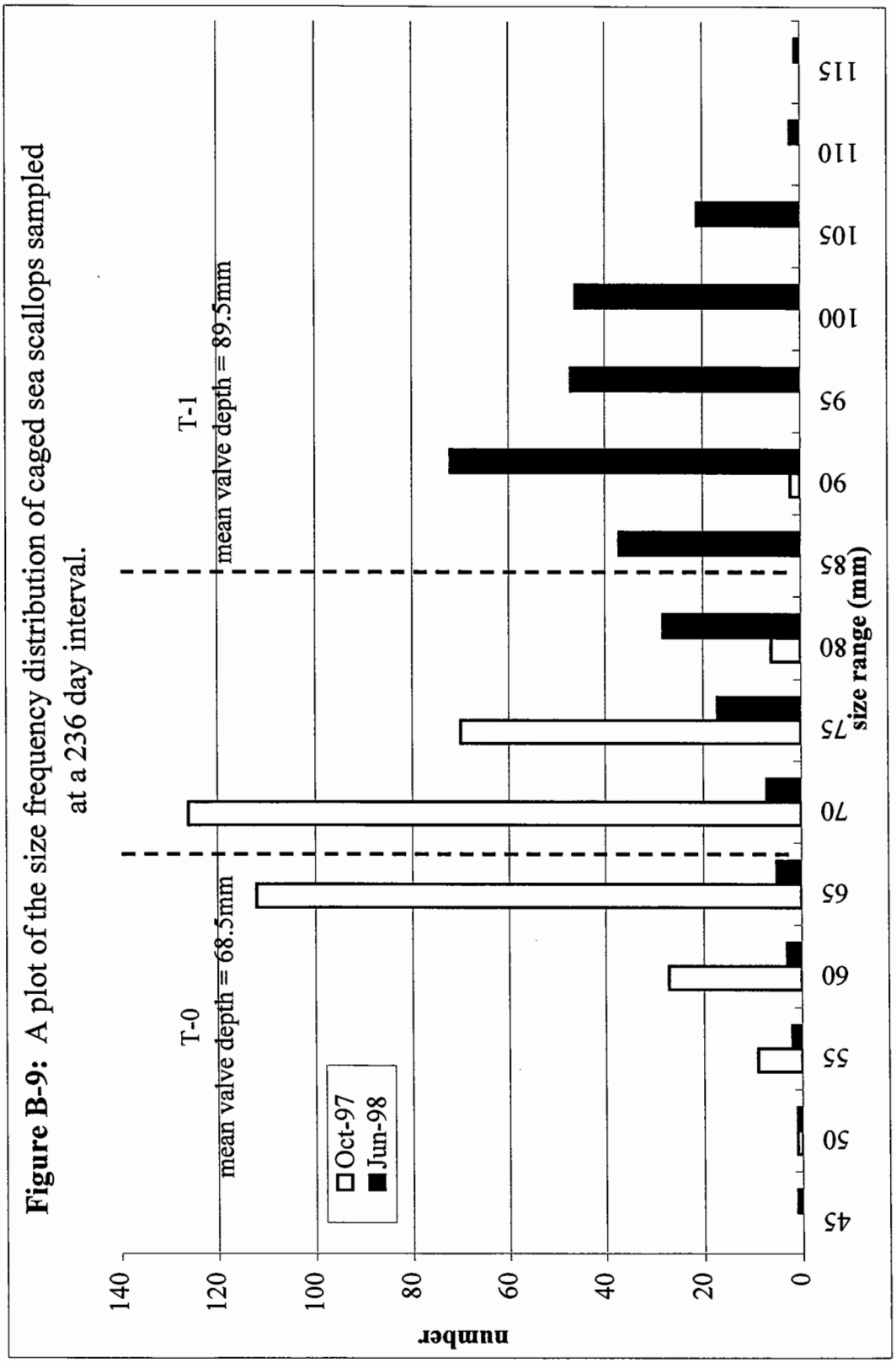


Figure B-9: A plot of the size frequency distribution of caged sea scallops sampled at a 236 day interval.

Appendix B: The Economics of Sea Scallop Farming

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Whether offshore sea scallop aquaculture becomes commercially viable will depend upon both the costs of growing scallops relative to wild harvest operations and conditions in the relevant product market. Our analysis focuses on these two relevant aspects.

We have constructed a discounted cash flow model of the growout of sea scallops at a nearshore or offshore farm site. This analysis helps us to predict commercial feasibility. There are several sources of uncertainty in the cash flow model. An important source of uncertainty is the exvessel price for sea scallops. Therefore, in order to help manage this uncertainty, we have also developed and estimated a model of supply and demand for New England sea scallops.

There are other reasons for modeling price formation in the market for sea scallops. One reason is to gain a deeper understanding of the kinds of factors, such as scallop imports, substitute seafood products, inventories, consumer wealth, among others, that may influence demand. Other factors, including fishing effort, stock size, fishing costs, and technological change, may influence the supply of sea scallops. Aquaculture entrepreneurs will need to develop a feel for all of these factors in order to run a successful operation.

1. The Market for Sea Scallops in New England

In this section, we review briefly earlier studies from the published literature that have estimated demand for scallops. Next we present time series data that help us to gain an understanding of the market. Finally, we present our demand and supply estimation method, and we estimate demand for sea scallops in New England using monthly data during the period 1985-93. We show how simple simulations can be performed to model the impacts of changes in the market on supply and demand. We emphasize that the results of this analysis are preliminary. Clearly, the model can be refined with additional massaging of the data or alternative specifications. As we discuss the model, we point out areas in which improvements might fruitfully be made.

1.1. Previous Work

Table 1.1 compares studies from the published literature in which analysts have developed models of demand, supply, or price prediction. Models of supply and demand rely upon basic price and quantity data from the relevant market as well as other determinants. Price prediction models do not attempt to distinguish demand from supply.[1] The latter use quantity and other variables to estimate price directly.

Altobello *et al.* (1977) developed the first original study to model the New England sea scallop market. Our analysis follows closely the approach adopted by these authors. Our analysis differs through the use of monthly, instead of yearly, data, and the use of more recent data. Like Altobello *et al.*, we employ a simple two-stage least squares technique to estimate supply and demand.

1.2. Data

We collected monthly data to estimate the models. The following figures present much of this data as well as data that helps describe the market for scallops.

[1] Typically, data on only prices and quantities do not permit the analyst to distinguish demand from supply.

Figure 1.1 displays monthly scallop landings in New Bedford from September 1985 through May 1996. New Bedford was picked as the largest and arguably most important market for scallops in New England. The data are from the NMFS Northeast Fisheries Center's "weighout species landings summary" reports (Means, p.c., 1996). Landings are the combined landings of scallops of different meat counts (sizes). The plot in Figure 1.1 shows a very strong sesonality in the data with peak landings occurring in May to June and troughs occurring during December to February. This seasonality corresponds roughly to periods of peak fishing during the late spring and early summer. The series appears to have a long cycle demonstrating that 1988 through 1992 were the best years for landings in the series. This quantity enters into both the supply and demand models below.

Figure 1.2 presents the monthly scallop "price" in New Bedford (Means, p.c., 1996). Price in this series is a reported value of landings across all grades of scallops divided by the total landings in that month. We can think of this price as a kind of weighted average across grades (sizes), with the grade quantities varying from month to month. The price series also shows a strong seasonality with peaks occurring during December. We note that this corresponds roughly with the drop off in fishing in late fall as the weather begins to deteriorate. In addition, there is an increase in demand for sea scallops during the holidays. The long-term trend appears to show a general increase in price beginning in the late 1980s; this corresponds with the drop off in landings shown in Figure 1.1. This price enters into both the supply and demand models below.

A complete analysis of the market for scallops should take into account the product differentiation according to scallop grade. Figure 1.3 demonstrates how price may vary across meat count levels. Each bar represents the difference in price between one category and the next highest category. These data are from landings of two scallop vessels during March 1994 through December 1995 (Smolowitz, p.c., 1997). The categories are measured in shucked scallop meats per pound. For example, the premium attached to scallops in the 10 to 20 meats per pound category over scallops in the 20 to 30 meats per pound category was about $0.55 for these two vessels during this period. Unfortunately, we do not have comparable data for the period for which we estimate demand and supply. We make an assumption that our market model is representative of scallops in the 30 to 40 meats per pound range. Thus, we expect that a markup for scallops harvested from the farm site (expected to be 10 to 20 meats per pound) will be approximately $0.78. We note that the premium may vary considerably, depending upon the quantities of scallop grades that appear on the market from month to month. Hence, this markup should be regarded as only a rough approximation.

Figure 1.4 displays monthly aggregate scallop imports into the United States from January 1985 through June 1998 (NMFS 1998). These data include imports of different grades from several different source countries. The major scallop exporters include Canada, China, Chile, and Peru. Canadian scallops, in particular, are very close substitutes for New England scallops (Edwards, p.c., 1998). As seen in Figure 1.4, imports have been on an upward trend since the late 1980s. Lately, there appears to be some seasonality in the series as importers are tracking the late season price increases in the U.S. market. The highest peaks correspond with significant exports from China: 2.5 million pounds during January-February 1994; 1.5 million pounds during May 1996; and 2.2 million pounds during December 1997. This series was not used to estimate supply and demand (import price was used instead), but it does contain useful information for understanding the market. It may be important in future work to disaggregate imports by country or by U.S. customs district to see whether imports from particular countries or into particular districts are important determinants of supply and demand.

Figure 1.5 displays the aggregate scallop import price in dollars per pound during January 1985 to June 1998 (NMFS 1998). The price series is very regular, showing distinct peaks in December. There does not appear to be much of a long-term trend in the series. Again, this series was constructed by dividing the value of imports by the quantity imported. It can be thought of as a weighted average import "price" across all sources and grades of imported scallops in the relevant month. This series was used as an instrument in the demand model.

Figure 1.6 displays monthly scallop holdings (inventories) on thousands of pounds during September 1985 to May 1996 (NMFS 1985-1996). This series indicates that inventories tend to build in

late summer and early fall. The series shows distinct peaks in the early fall. The series exhibits a slight long-term downward trend, possibly indicating that inventories are becoming less important in the scallop market. We employ this series as an instrument in the demand model.

Figure 1.7 displays monthly scallop freezings in thousands of pounds during September 1985 to May 1996 (NMFS 1985-96). Scallop freezings are a subset of inventoried scallops. Freezings tend to peak during the summer when most of the landings occur. A relatively large peak occurred during June 1990, which is bracketed by smaller but still relatively large peaks during March and September of the same year. These peaks are correlated with the largest landings during the period of the series, indicating that freezings occur when the market is incapable of absorbing very large quantities of scallops. In reality, scallops could be sold fresh during any period, but, because the price is low, producers are making a strategic decision to freeze scallops to be sold at a later date (at a price below fresh scallops). Scallop freezings have not been incorporated into our supply-demand model, but they may be a useful variable for future analyses.

Figure 1.8 displays the monthly refiner price of No. 2 diesel fuel to end users in cents per gallon (EIA 1998). We believe that this series is a good measure of energy costs of scallop fishing and is correlated with fishing effort. The series is basically a measure of energy prices, focusing on the kind of fuel used by scallop draggers. We use this series as an instrument in the supply model.

Figure 1.9 displays seafood sales in the United States measured in millions of dollars (BEA 1985-96). This series represents sales of all seafood including scallops. The series shows a very regular seasonal pattern of increasingly higher peaks from April to August to December in each year. These peaks correspond most likely to the Easter holiday, summer vacations, and the Christmas season. These holidays and vacations are thought to be peak times for seafood demand. This series was not incorporated into the supply-demand model, but it gives us a general picture of the market for seafood during the last decade.

Figure 1.10 depicts restaurant sales in millions of dollars for the entire United States and for the northeastern United States during September 1995 to May 1996 (BEA 1985-96). These series demonstrate a very regular pattern of "head and shoulders" type peaks beginning in April and May, moving to the highest peaks in August, and followed by peaks in October-November and in December. These peaks correspond generally with times of the year when restaurant demand rises, similar to the explanation for Figure 1.9. Restaurant sales include sales of seafood in restaurants as a subset, and therefore are a general measure of the demand for seafood. This series was not incorporated into the sea scallop supply-demand model, but it does give us a general picture of one of the most important end user markets for sea scallops.

1.3. Demand for Sea Scallops

A plot of New Bedford sea scallop prices against landings reveals an inverse relationship: as landings increase, prices decline (Figure 1.11). Without additional information, however, it is not possible to say whether this relationship is an accurate representation of the demand for sea scallops. For example, quantities of sea scallops demanded and supplied are both functions of sea scallop price. We can use economic theory to help differentiate demand from supply in the New England sea scallop market. Economic theory suggests that if we can identify other variables that are determinants of either demand or supply, then it may be possible to use this information to map out separate demand and supply schedules.

We expect that the demand for sea scallops may be a function of the exvessel price, p^l; a measure of disposable income, y; the size of inventories, I; and the price of imports, p^{imp}. In this model, we treat imports of scallops as close substitutes for New England sea scallops. (We use import price instead of quantity, but the latter is a potential variable to be explored in future work.) We expect that the supply of sea scallops may be a function of the exvessel price, p^l; the size of the wild stock, x; fishing effort, e; time, t; and the price of diesel fuel, f. Our stock size variable is an index available only on an annual basis, so that all values are constant during any particular year.[2] Fishing effort is measured in terms of the number of "days absent" for vessels in the New England sea scallop fleet. Time is a measure of factors that change

[2] In future work, we may be able to create a monthly index of stock size by subtracting scallop harvest in each month from the annual value.

during the length of the series, such as technological advances in harvesting. The price of diesel fuel is a rough approximation of the cost of fishing. We write the quantities of sea scallops demanded, q^d, and supplied, q^s, as follows:

$$q_t^d = \beta_0 + \beta_1 p_t^l + \beta_2 y_t + \beta_3 i_t + \beta_4 p_t^{imp} + e_t^d$$
$$q_t^s = \alpha_0 + \alpha_1 p_t^l + \alpha_2 x_t + \alpha_3 e_t + \alpha_4 t + \alpha_5 f_t + e_t^s$$

This model is a set of linear simultaneous equations, and we use the two-stage least squares method to handle it.[3]

Table 1.2 presents the results of the estimation using data from 1985 through 1993. Although we do have more recent data for some of the model variables, we are limited to 1993 for data on abundance and days absent. All variables are significant except for disposable income. The results indicate that the current formulation explains about 57 percent of the variation in inverse demand and about 65 percent of the variation in quantity supplied.

Variable	Supply	Demand
Intercept	453.86 ***	10.19 ***
Estimated price	-66.84 ***	
Disposable income	-1.67	
Inventories	-0.76 *	
Import price	32.47 **	
Estimated landings		-0.02 **
Stock size		-0.12 ***
Days absent		0.03 *
Time		-0.02 ***
Price of Diesel Fuel		-0.02 **
R2	0.57	0.65
DW	1.29	0.66

Values significant at 10%(*), 5%(**), and 1%(***) confidence levels.

***Table 1.2**: Supply-demand regression results*

Figure 1.12 is a plot of supply (red) and demand (blue) in the market for New England sea scallops using mean values for the variables in dollars per pound. The horizontal axis represents landings of New Bedford sea scallops in 100,000 pound units. The model is a linear representation of both supply and demand, implying a choke price of about $7.36 per pound. The average market equilibrium over the 1985-93 period is about $5.42 per pound. The downward sloping supply curve is characteristic of an overexploited fishery, where it operates in the upper portion of a backward bending supply curve.

Figure 1.13 is a plot of the demand curve. We show how changes in the variables other than landings act to act to shift demand up or down. For example, a decrease in the price of imports will lower the demand for New Bedford scallops and vice versa. Thus it will be important for aquaculture producers to keep a close eye on imports of scallops. Although we have not modeled demand for different grades of scallops, we can make the assumption that demand for the largest scallops can be represented by a demand curve that is shifted upward but parallel to average demand.

[3] In future work, we may be able to improve the consistency of parameter estimates using a three-stage technique.

2. Farm Operation Economics

We examine the economic viability of four alternative approaches to scallop farming: seabed seeding and three variations on cage culture:

- lantern cages
- bottom cage trawls
- bottom cage clusters

For each alternative, we estimate capital and operating costs and revenues over a 20 year period. We assume a two-year cycle from collection of juveniles to harvest, and scale the farming operation in every case to produce 100,000 pounds of scallop meat per two-year cycle (that is, every other year).

Capital equipment includes guard buoys around the farming site and cages and cage moorings. Vessels are not treated as capital costs; rather, we model them as operational expenses and assume that appropriate vessels can be chartered or leased as needed for representative daily rates.

Details about baseline assumptions are given in the following section.

2.1. Baseline Assumptions

The following baseline assumptions are applied to all four farming modes:

- The farming site is 2 hours by boat from port.
- The farming site is surrounded by marker buoys spaced 200 meters apart. Marker buoys/moorings cost $3000 and have a life of 10 years with annual maintenance requirements of 3 hours of boat time and $150 per marker buoy.
- Cage moorings have a life of 10 years; the cages themselves have a life of 5 years.
- The growout cycle is 2 years, and the operation is scaled to bring to market 40,000 lbs of scallop meat per growout cycle. Scallops are sold at dockside for $7/lb of meat.
- 12 hour working days.
- Vessels are capable of capturing and bringing to the farming site an average of 40,000 juvenile scallops in one day.
- $20,000 per year is included for administrative/marketing/management expenses onshore.

In addition, we make specific baseline assumptions for each farming mode as outlined in Table 2.1. Cage and cage mooring cost estimates, deployment and harvesting efficiencies, maintenance requirements, and biological parameters are based on input provided by the engineering team for this project. The seabed seeding approach is expected to result in significantly greater loss and mortality and in lower growth (higher meat count at harvest) than the cage alternatives. The tradeoff is the greater cost associated with acquisition, deployment, maintenance, and harvesting of cages and moorings.

	Seabed Seeding	Lantern Cages	Bottom Cage Trawls	Bottom Cage Clusters
gear				
cost of mooring gear	n/a	$2,000	$200	$2,000
cost of cage	n/a	$5,000	$25	$25
# of cages/mooring	n/a	1	20	60
mooring spacing	n/a	30 m	10 m	30 m
operations				
cage deployment	n/a	2 hours/cage	20 cages/hour	20cages/hour
harvesting	5 acres/hour	1 cage/hour	40 cages/hour	40 cages/hour
maint. visits to moorings	n/a	3 over 2 years	3 over 2 years	3 over 2 years
maint. time per visit	n/a	1 hour/mooring	1 hour/mooring	2 hours/mooring
mooring maint. cost	n/a	$100/year	$20/year	$100/year
cage maintenance cost	n/a	$100/year	$5/year	$5/year
boat cost	$2,000/day	$2,000/day	$500/day	$2,000/day
biology				
seeding density	40,000 juv/acre	10,000 juv/cage	100 juv/cage	100 juv/cage
loss rate over 2 years	50%	20%	20%	20%
average size at harvest	25 count	20 count	20 count	20 count
other				
shore facility lease	n/a	$10,000/year	$10,000/year	$10,000/year

Table 2.1: *Baseline assumptions for economic model.*

2.2. Results

The results of the economic model using the baseline assumptions for each farming approach are summarized in Table 2.2.

	Seabed Seeding	Lantern Cages	Bottom Cage Trawls	Bottom Cage Clusters
performance				
NPV @ 10% real discount rate ($k)	1,354	*-3,723*	*-1,965*	*-7,324*
avg. annual revenue ($k)	350	350	350	350
avg. annual costs ($k)	171	533	393	693
avg. net revenue/yr ($k)	179	*-183*	*-43*	*-343*
scale				
acreage	143 acres	62 acres	34 acres	104 acres
gear	n/a	250 cages 250 moorings	25,000 cages 1250 moorings	25,000 cages 417 moorings
number of marker buoys	14	9	7	12
capital investment ($k)	42	1,777	896	1,494
vessel time				
collecting & deployment	142 days/cycle	126 days/cycle	220 days/cycle	220 days/cycle
harvesting	3 days/cycle	32 days/cycle	79 days/cycle	79 days/cycle
mooring & buoy maint.	5 days/year	50 days/year	237 days/year	160 days/year
cost breakdown				
gear acquisition ($k)	4 (2%)	303 (56%)	152 (39%)	212 (31%)
gear maintenance ($k)	2 (1%)	46 (9%)	136 (35%)	152 (22%)
collect/deploym't ($k)	142 (83%)	126 (23%)	55 (14%)	220 (32%)
harvesting ($k)	3 (2%)	32 (6%)	20 (5%)	79 (11%)

Table 2.2: *Baseline results of economic analysis.*

Under baseline assumptions, the only alternative that is profitable is seabed seeding. A 100,000 lbs/cycle seabed seeding operation requires less than $400,000 in start-up capital and pays back the initial investment in four years. It requires a lease area of about 150 acres and requires the use of a large scallop vessel on average about 3 months out of the year.

The cage operations are not profitable because the higher survival rate and growth are not enough to justify the added cost of buying, maintaining, and deploying/harvesting the cages and associated moorings. Although they require smaller lease areas, the cage operations demand between $1 million and $2 million in startup funding. Of the three alternatives, bottom cage trawls come closest to breakeven because gear costs are relatively modest. The bottom cage cluster approach appears to be economically hopeless.

We conduct sensitivity analysis on key parameters to test the robustness of the results produced by the baseline analysis. For the seabed seeding approach, we examine the effect of changes in dockside price and loss rate on profitability. For the cage alternatives, we estimate what changes in baseline parameters would be required to make the operations profitable.

Seabed Seeding: Figure 2.1 shows the net present value of a 100,000 lbs/cycle seabed seeding operation as function of dockside price and mortality/loss rate. It is evident that the profitability of this approach to scallop farming is robust. Even at dockside prices as low as $4/lb, the operation is marginally profitable at loss rates as high as 50%; and at $6/lb, loss rates of nearly 70% could be tolerated. In a seabed seeding operation, the distance of the farming site from port is not as important as its location relative to likely juvenile catch areas.

Lantern Cages: The expense of cage gear and filling/deploying cages is problematic. Even dramatic reductions in gear cost (down to 20% of baseline acquisition cost for moorings and cages) combined with four-fold improvement in cage filling and deployment speed does not produce a profitable operation under baseline circumstances (NPV -$285k). NPV is just positive if in addition to these efficiencies, the farming site is less than one hour from port.

A four-fold improvement in collecting/deploying/harvesting efficiency alone, without any reduction in gear cost below baseline assumptions, does not make the lantern cage operation viable, even if mortality/loss is reduced to zero. Gear cost is the driving factor here. It seems unlikely that a lantern cage operation of this kind can be profitable.

Bottom Cage Trawls: Gear acquisition and maintenance costs predominate. To produce a positive NPV, it is necessary to reduce mooring and cage acquisition/maintenance costs by 50% and improve juvenile collection, cage deployment, and harvesting efficiencies by a factor of two over baseline assumptions, while also keeping the operation within one hour of port.

If gear acquisition costs cannot be reduced, it is possible to make the bottom cage trawl operation profitable if, in addition to the other improvements specified in the paragraph above, the mortality/loss rate can be cut to 10%. While this may represent a significant challenge, it seems the bottom cage trawl approach has a greater chance of being made profitable than either of the other cage operation modes.

Any weakness in dockside price below $7/lb makes profitability difficult even with the improvements outlined above.

Bottom Cage Clusters: As with the lantern cage approach, gear acquisition and collecting/deployment costs predominate. It seems virtually impossible to make the bottom cage cluster approach profitable even with across-the-board improvements by a factor of two and elimination of all mortality/loss.

Gear cost dominates the economics of all cage farming options. The economics of cage operations could be improved greatly if it is possible to increase the number of scallops per cage without significantly raising the cost of each cage.

3. Optimal Farm Production

It is useful to think of the problem of production from an offshore farm as an inventory problem. The scallops grow over a period of about two years to a size that commands a premium over the average size scallop. If the potential production from an offshore farm is small relative to the market, then it is optimal for the farmer to act as a price taker. If it is possible to produce scallops during any month of the year, then the farmer should pick the month (usually January) with the highest price.

However, the market for scallops in New Bedford is not all that large. If significant quantities of scallops from an offshore farm are delivered to the market in New Bedford, they are likely to depress the price. Thus it makes sense to consider this effect when choosing the best time to harvest aquaculture product.

Figure 3.1, panels (a) and (b), presents the results of a simple optimization model that determines when and how many sea scallops should be harvested from the farm site (the two figures show the natural logarithm of thousands of pounds of aquaculture output). The demand for scallops has been incorporated specifically into the optimization routine. We first calculate average landings per month over a period of years. (The period can be selected by the farmer based upon experience with the market. For example, panel (a) presents average landings per month over the period 1985-1996, and panel (b) presents actual landings per month during 1995 only.) The model seeks to maximize total revenues over the year through the choice of production from the aquaculture site. In each month, production from the aquaculture site is added to average production for that month. This total production (wild harvest plus aquaculture) is inserted into the demand function to determine a market price. Next, aquaculture output is multiplied by the market price, and the costs of recovering aquacultured sea scallops is subtracted from this product. The result is a schedule of monthly harvest over the year.

We examine the pattern of harvests for four different levels of production in each panel of Figure 3.1. These levels are 10, 50, 100, and 200 thousand pounds (recall that the cash flow model of section 2 was run with 100,000 pounds as the relevant output). Both panels demonstrate that when aquaculture output is small, the farmer should act as a price taker, harvesting and marketing his product only in January. As potential output increases, however, the time profile of output shifts. Using the long-term monthly average represented in panel (a), output of up to 150 thousand pounds should be allocated in January and November. When output reaches 200 thousand pounds, there should be some level of production in every month except July.

When using wild harvest output from 1995 only, the time profile changes. Output in 1995 is well below the 12 year average in every month, but it tends to be less uniformly distributed so that the late fall and early winter outputs are much lower, relative to outputs in the other months, than the same output for the 12 year average. As a result, price tends to be relatively higher during the late fall and early winter of 1995, and therefore it pays to place aquaculture output on the market in November and January even at very high levels of production.

Because we are uncertain about mortality on the farm, the time profile of production is suggestive of a strategy for harvesting the aquaculture product. Referring back to panel (a) of Figure 3.1, it may be sensible to "sample" the product through partial harvesting, say, in October. This sample will give the farmer an estimate of mortality. If mortality is low, then a production profile that places product on the market in every month might be followed. If mortality is high, then production should be adjusted accordingly, and product would be placed on the market in November and January. Note also that the production profile can be readjusted during the year as market conditions become revealed and as uncertainty about the quality of the farmed product is reduced. In essence, the optimization routine should be used as a real-time production and marketing tool.

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Table 1.1: Economic Models: Scallops

Authors	Price Prediction	Demand	Supply	Data
Altobello, Storey and Conrad (1977)		X	X	1952-72 (annual)
Storey and Willis (1978)		X		1953-76 (annual)
Edwards (1981)		X[§]	X	? (monthly)
Wang, Goodreau and Mueller (1986)		X[§]	X	1965-79 (annual)
Kellogg, Easley and Johnson (1988)[†]	X			1974-83 (weekly)
Kahn and Rockel (1988)[‡]		X	X	1963-84 (annual)
New England Fishery Management Council (1993)	X[§]			1976-92 (annual)
This Study (1998)		X	X	1985-93 (monthly)

[†]North Carolina bay scallops.
[‡]New York bay scallops.
[§]Includes an import price prediction model.

Figure 1.1: New Bedford monthly scallop landings (Sep 85-May 96) (pounds)

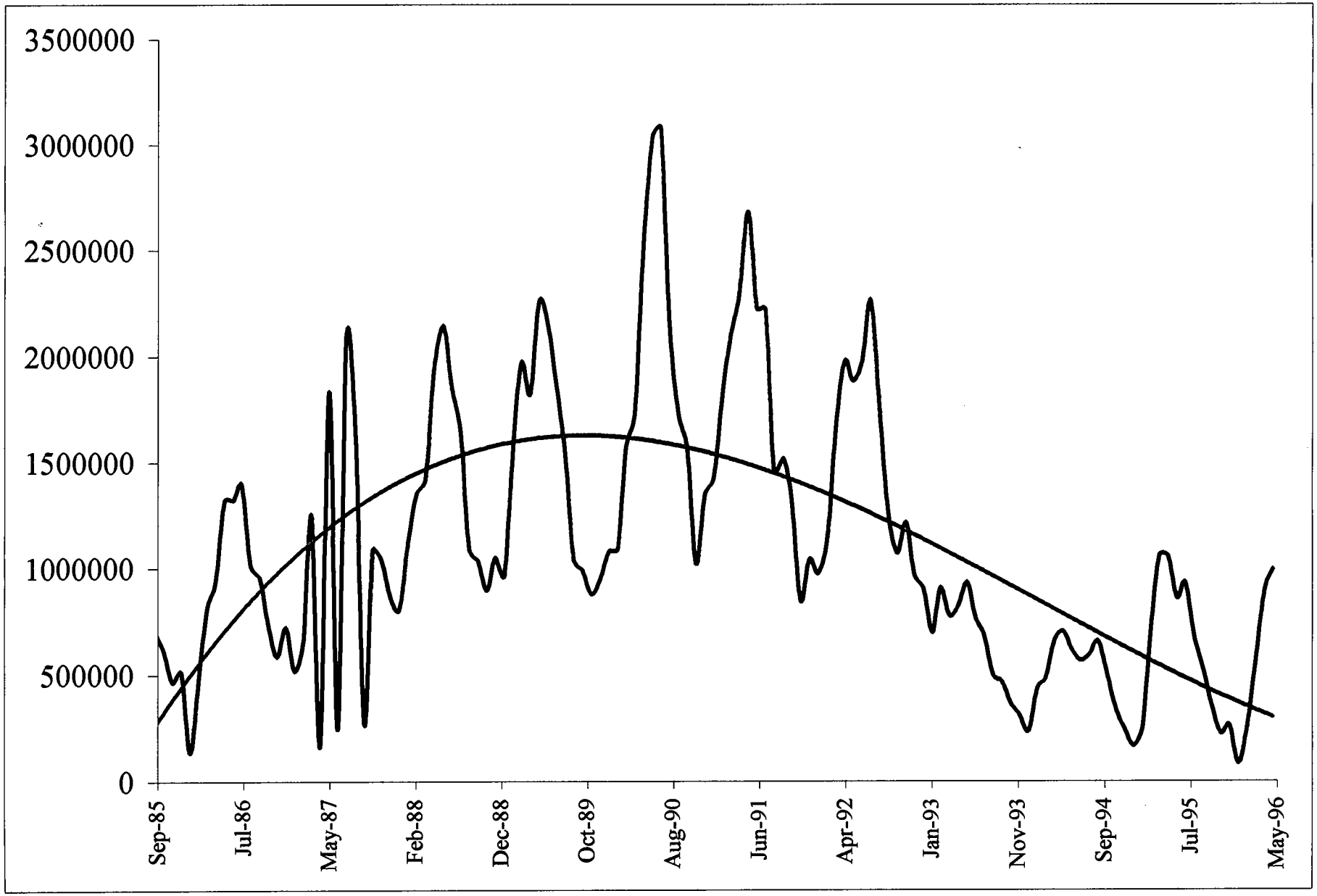

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Figure 1.2: New Bedford monthly scallop "price" (Sep 95-May 96) ($/pound)

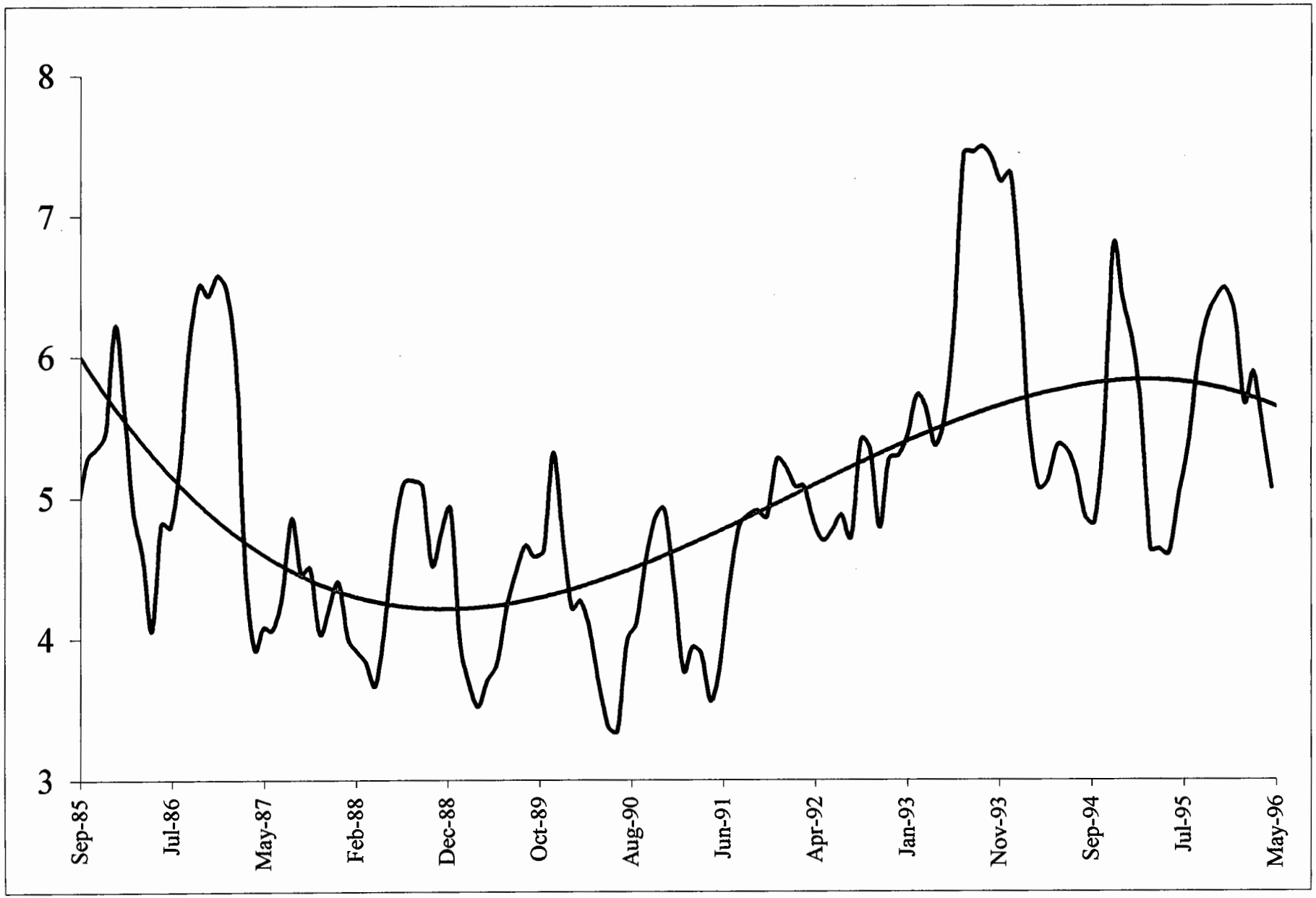

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Figure 1.3: Meat count premia (Mar 94-Dec 95) ($/lb)

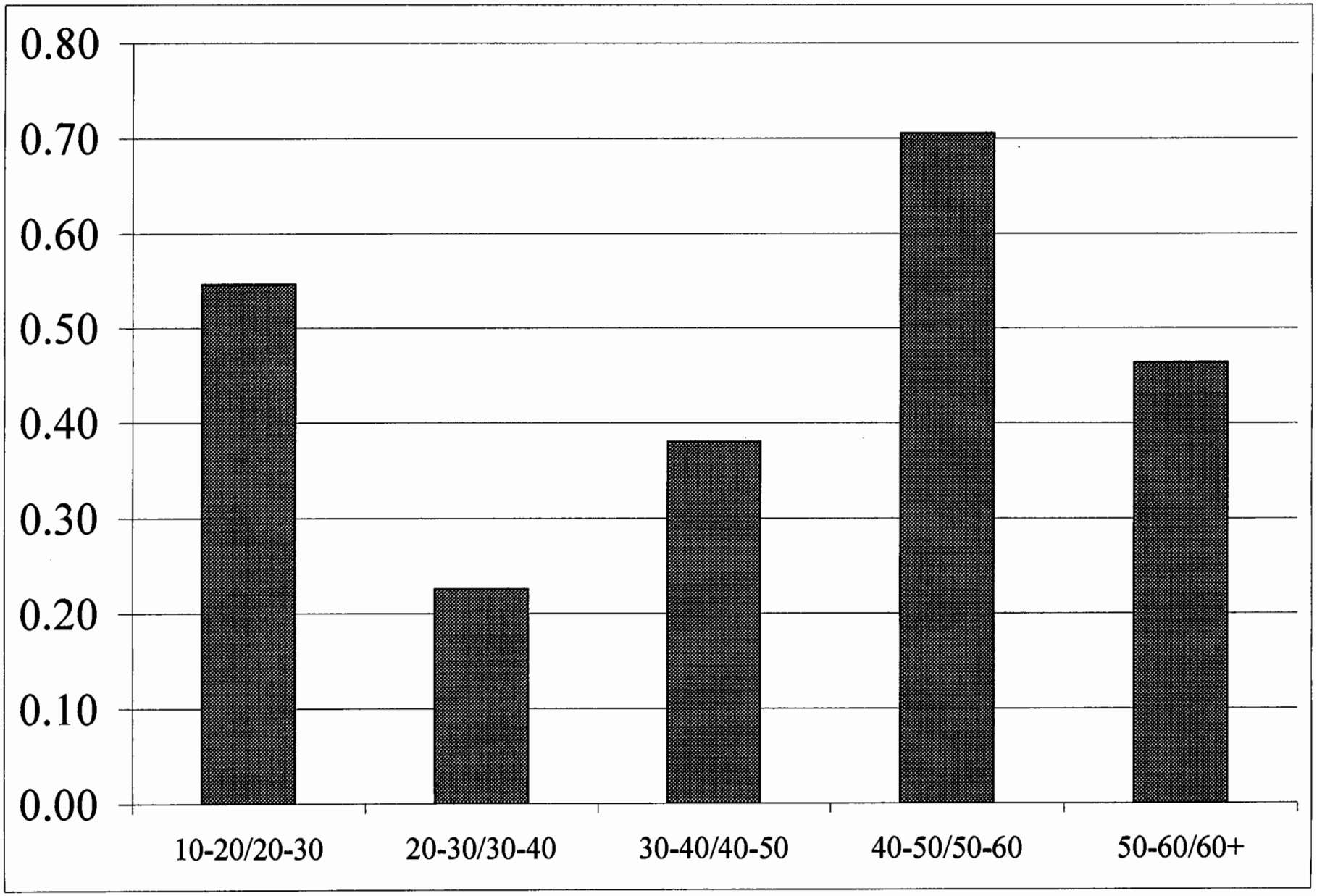

Figure 1.4: U.S. monthly aggregate scallop imports (pounds)

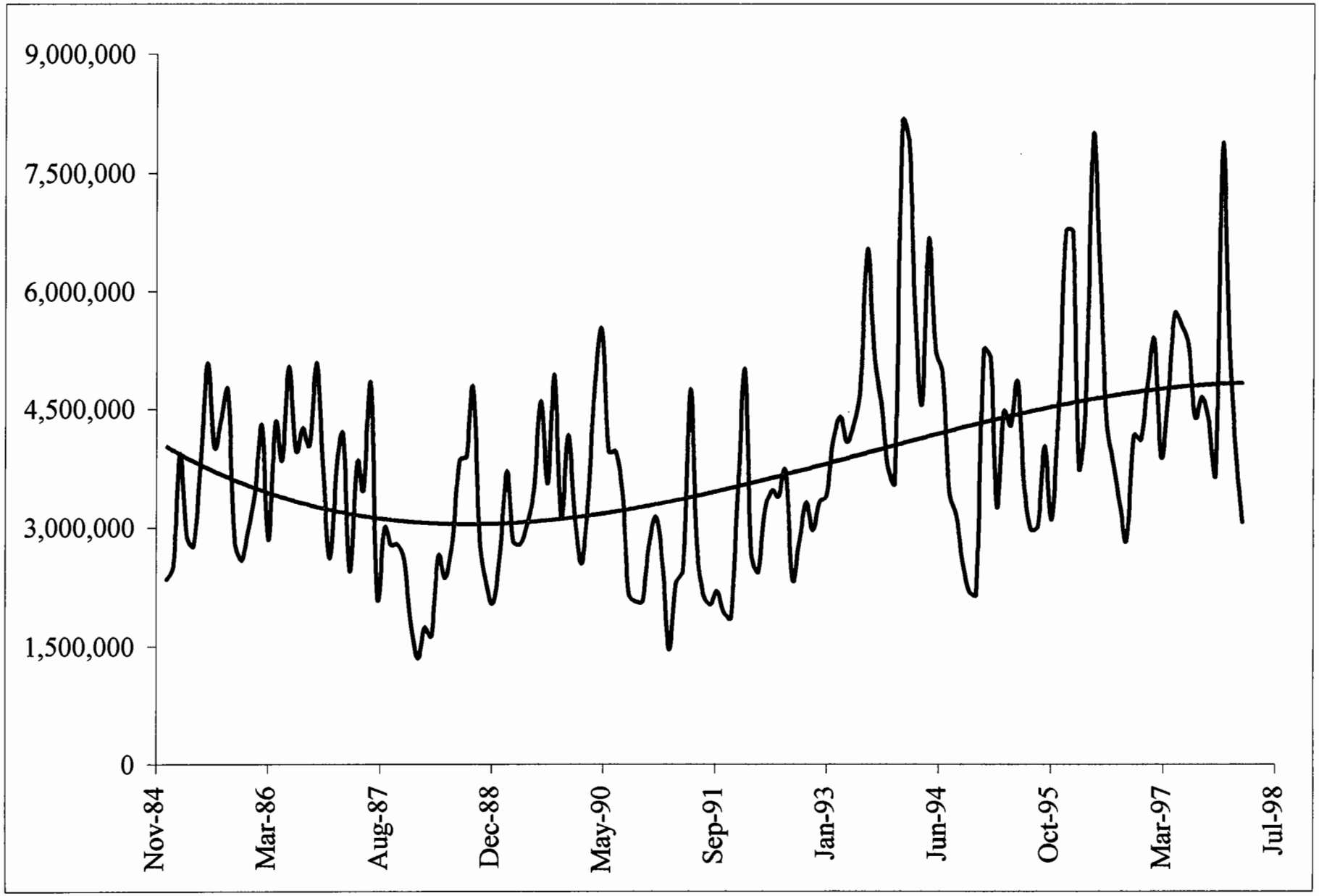

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Figure 1.5: U.S. monthly aggregate scallop import "price" ($/pound)

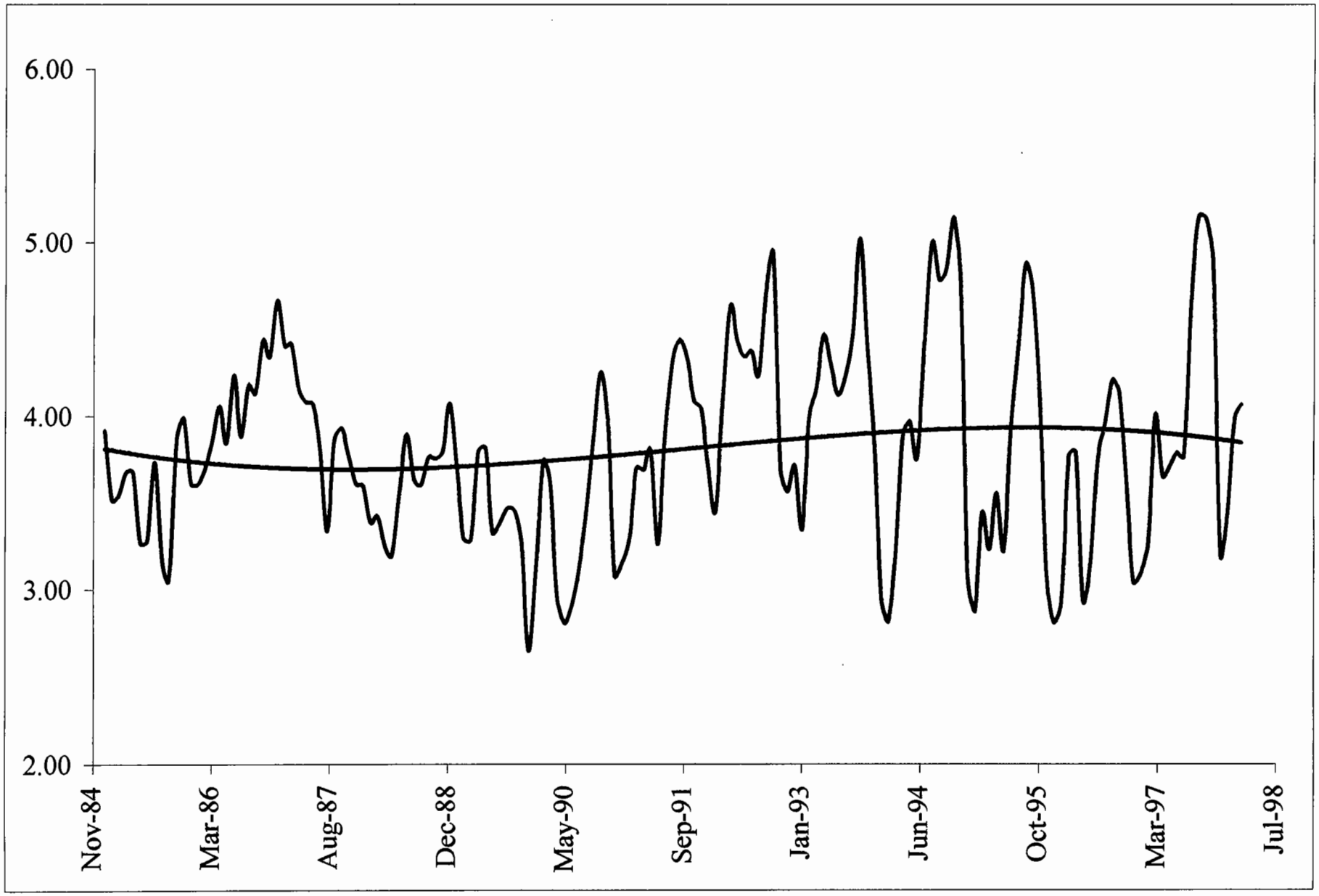

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Figure 1.6: Scallop holdings (Sep 85-May 96) (000 pounds)

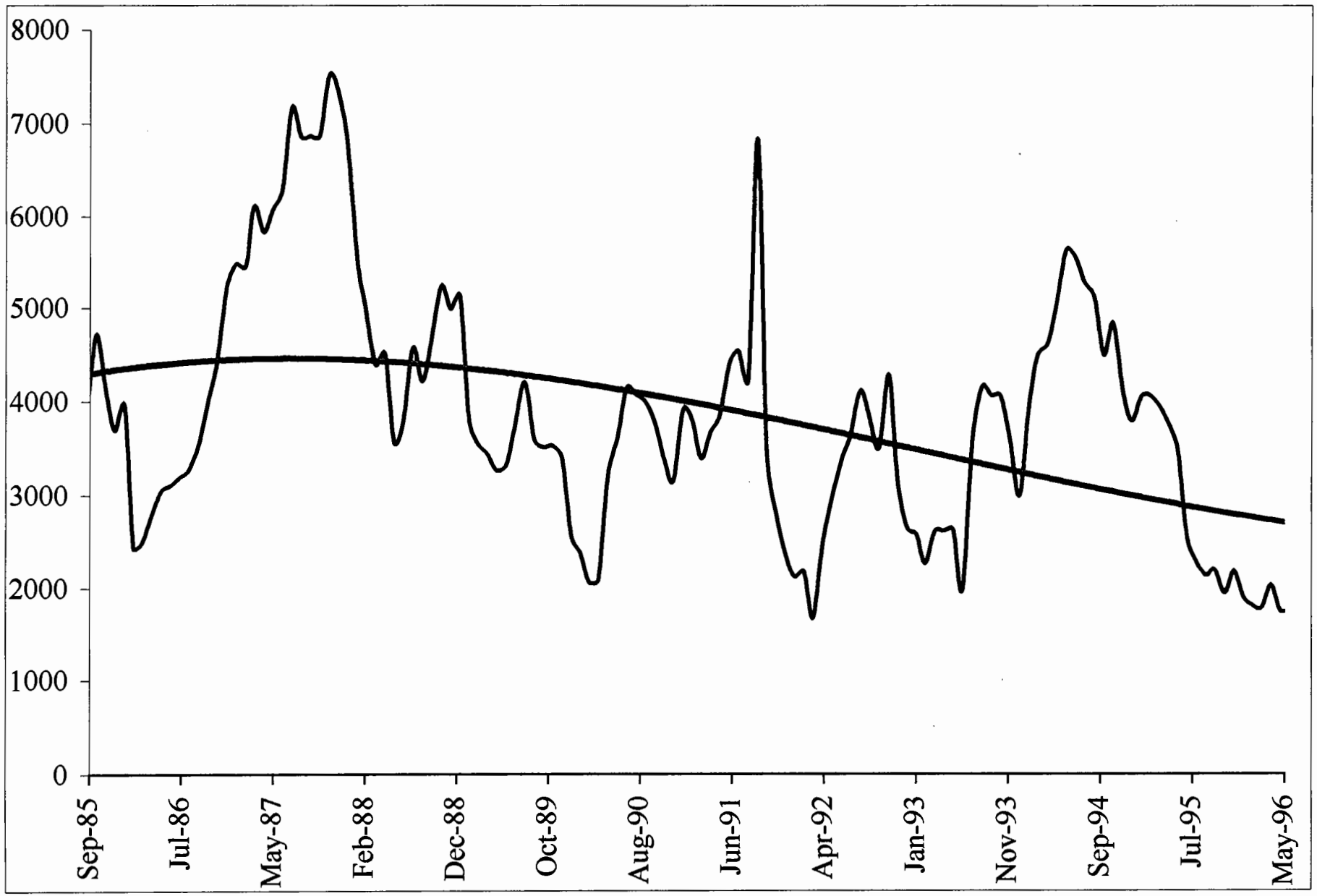

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Figure 1.7: Scallop freezings (Sep 85-May 96) (000 pounds)

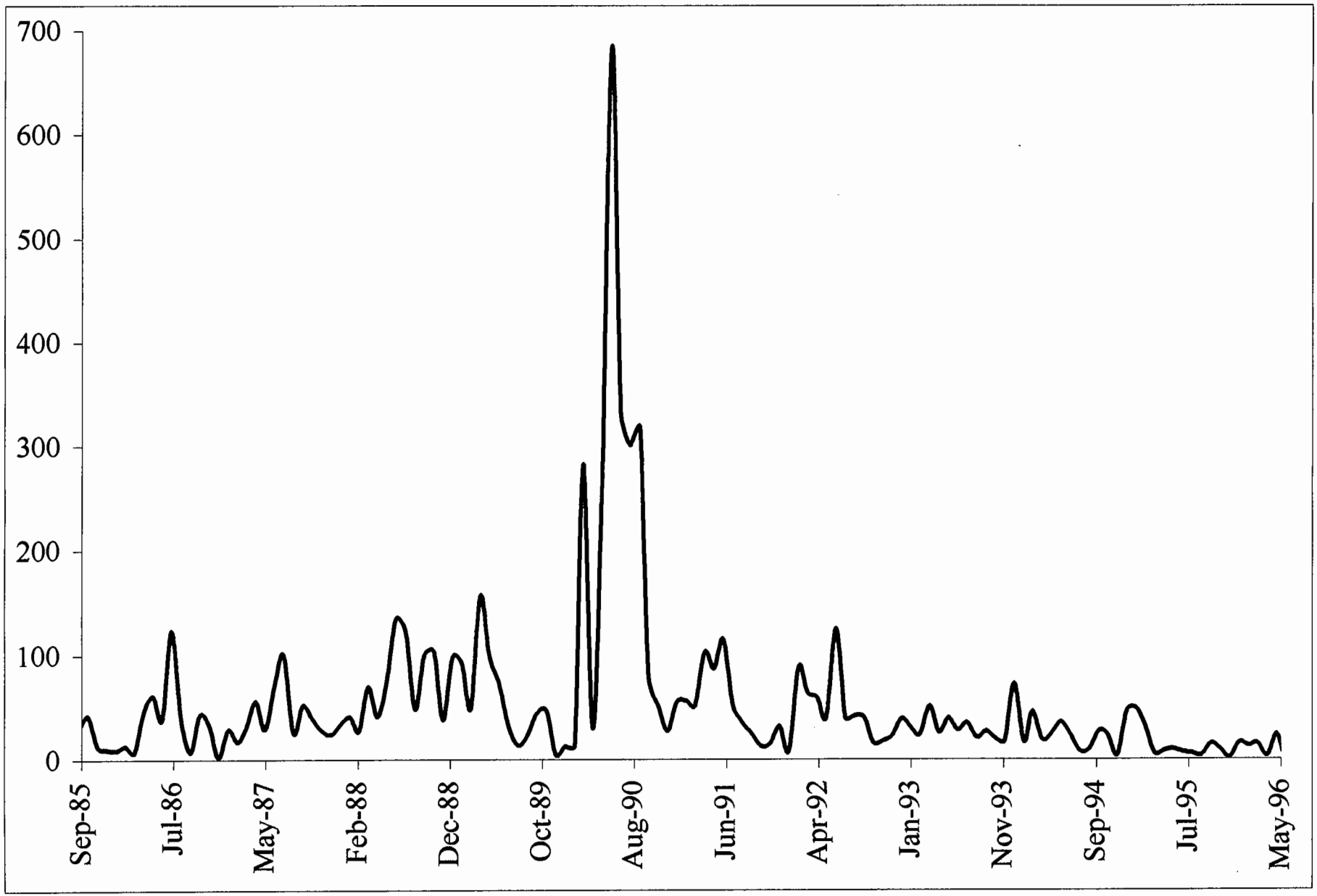

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Figure 1.8: Refiner price of No. 2 diesel fuel to end users (Jan 85-Dec 93) (cents/gallon)

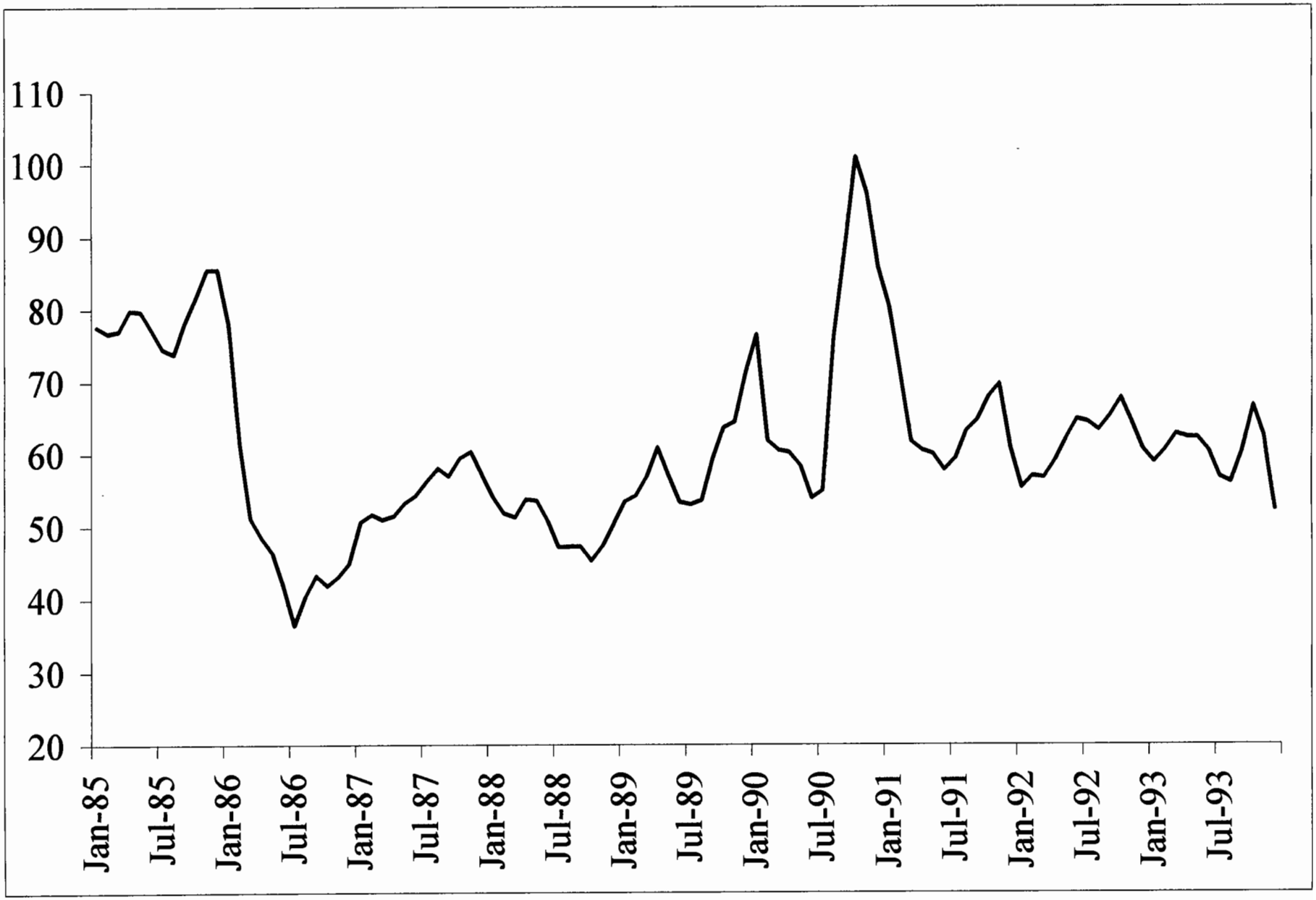

Figure 1.9: U.S seafood sales (Sep 85-May 96) ($ millions)

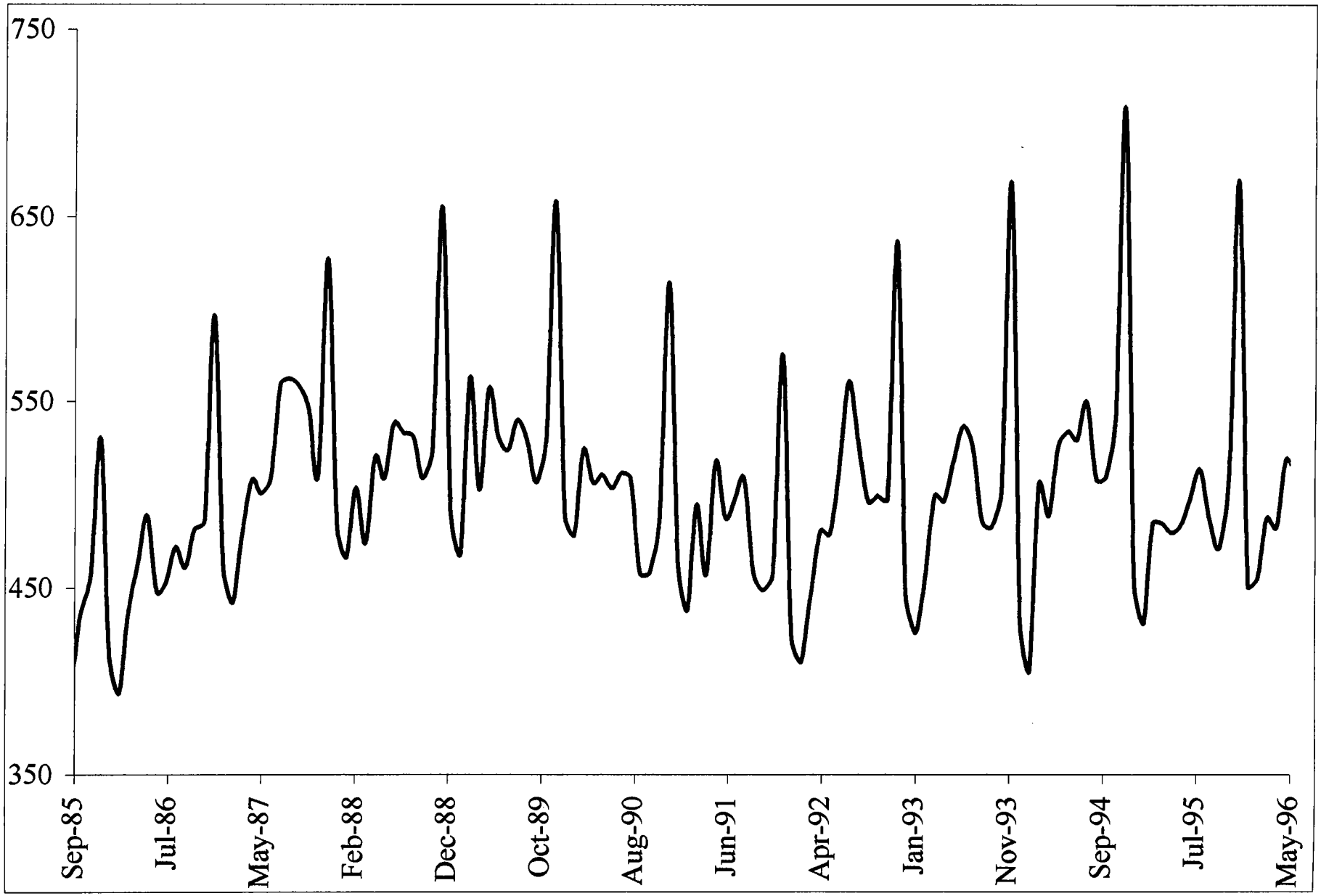

Figure 1.10: U.S. and Northeast restaurant sales (Sep 85-May96) ($ millions)

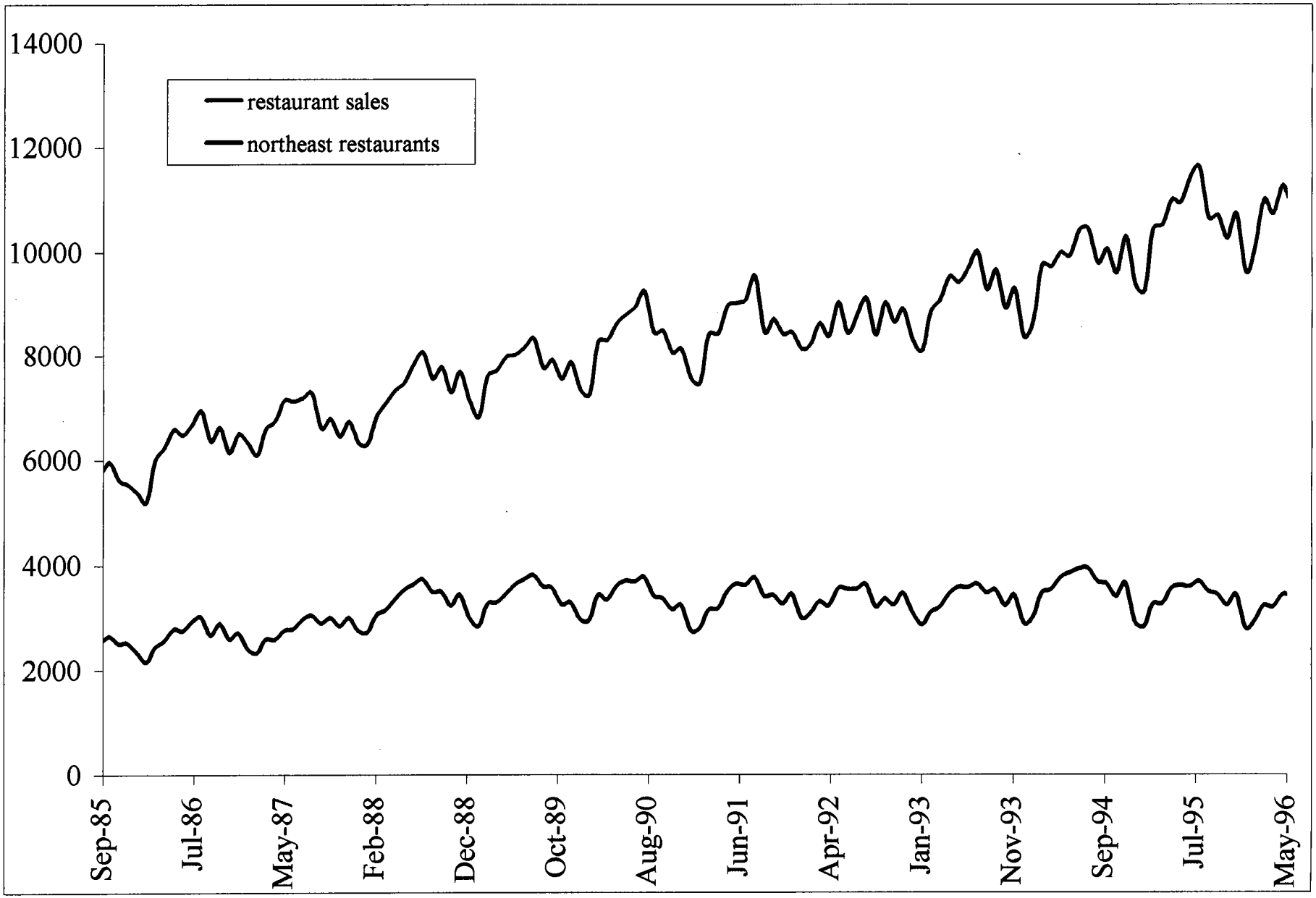

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Figure 1.11: New Bedford sea scallop landings and prices (Sep 85-May 96)

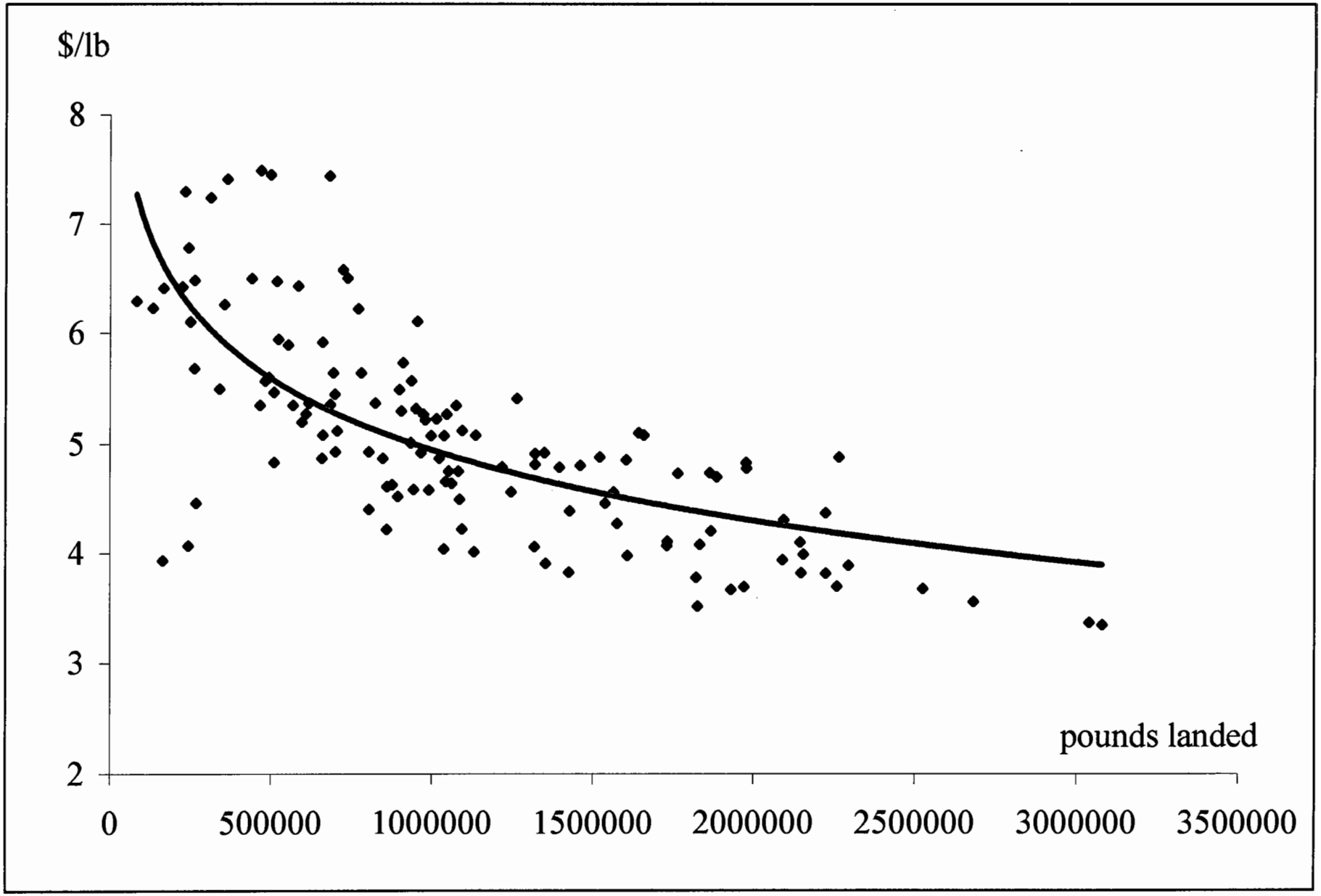


Figure 1.12: Average aggregate supply (red) and demand (blue) in the New England sea scallop fishery

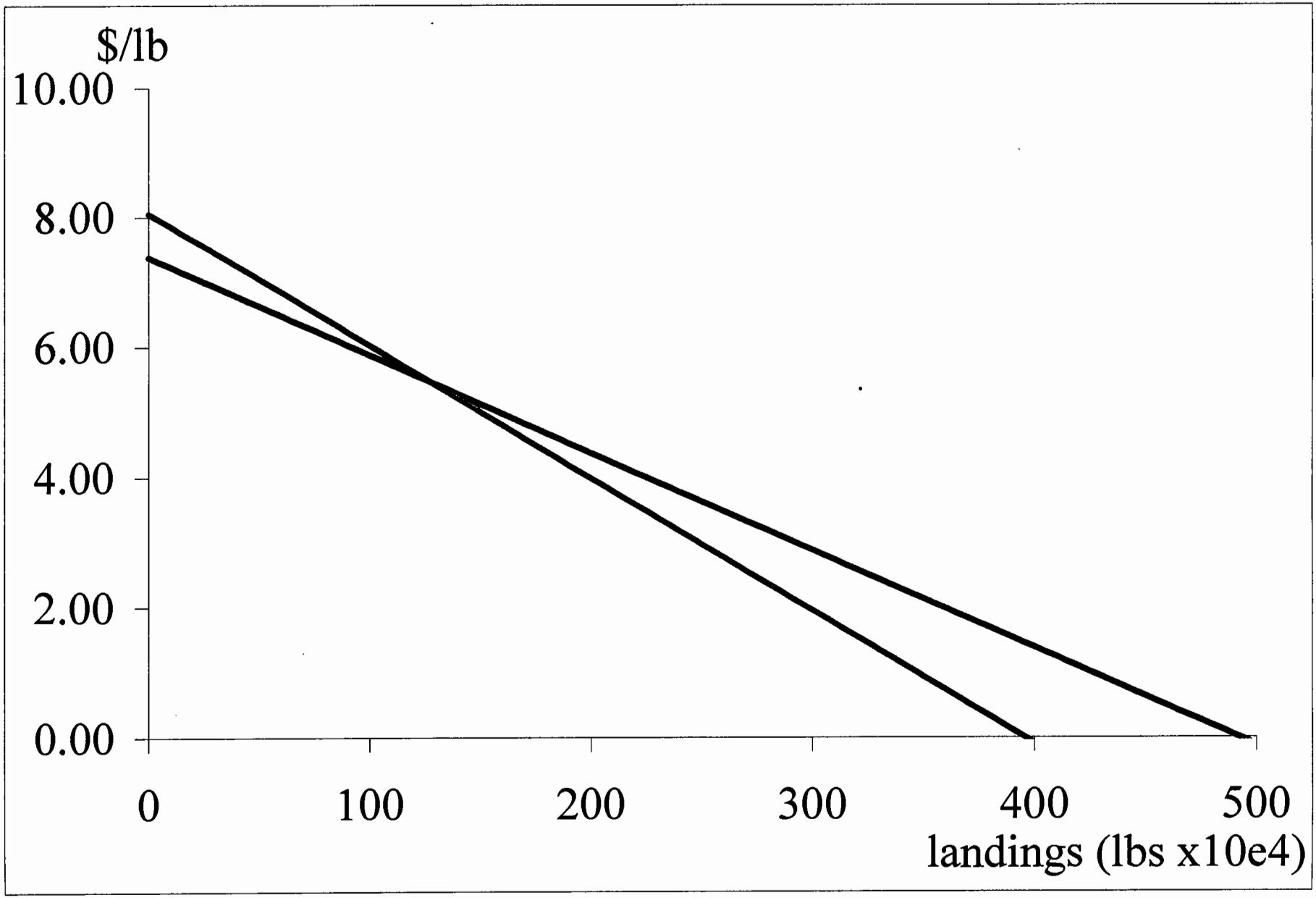


Figure 1.13: New England averages aggregate sea scallop demand:
shifts due to changes in "price" of imports: $7.00/lb (red) and $2.00/lb (green)

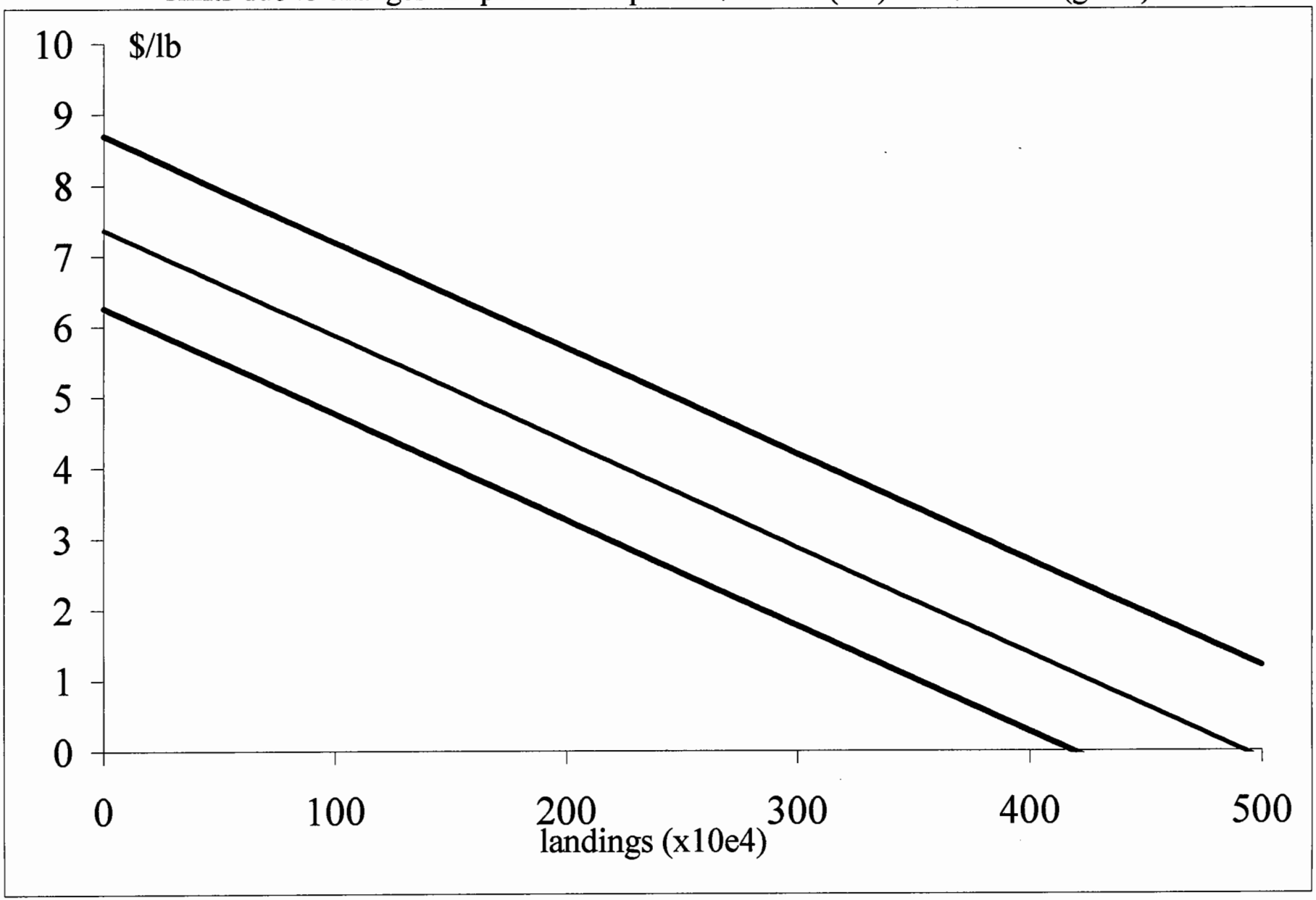


Figure 2.1: Seabed Seeding NPV as a Function of Dockside Price and Cycle Mortality/Loss Rate

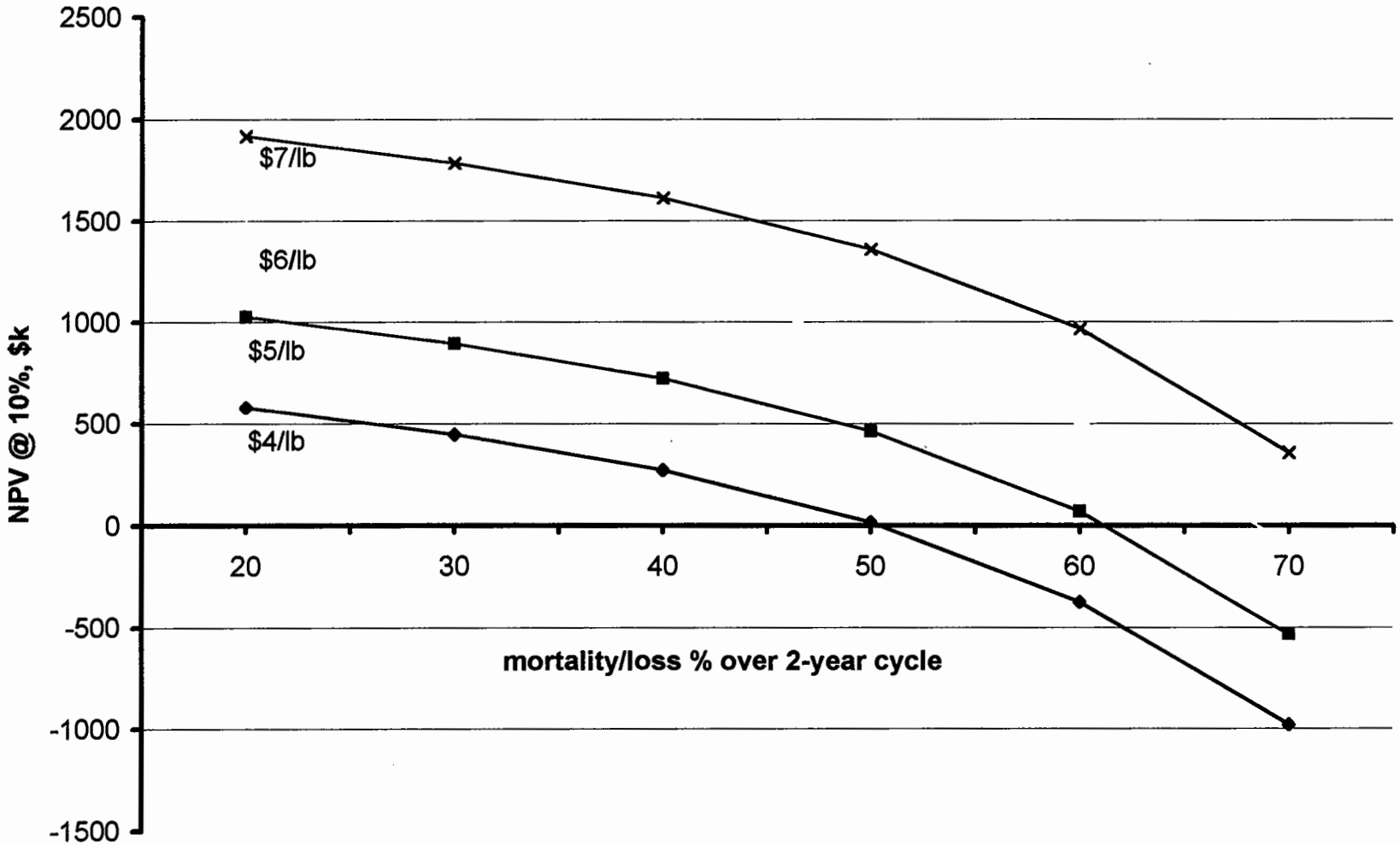


Figure 3.1(a): Optimal annual production profile (1985-96 basis)

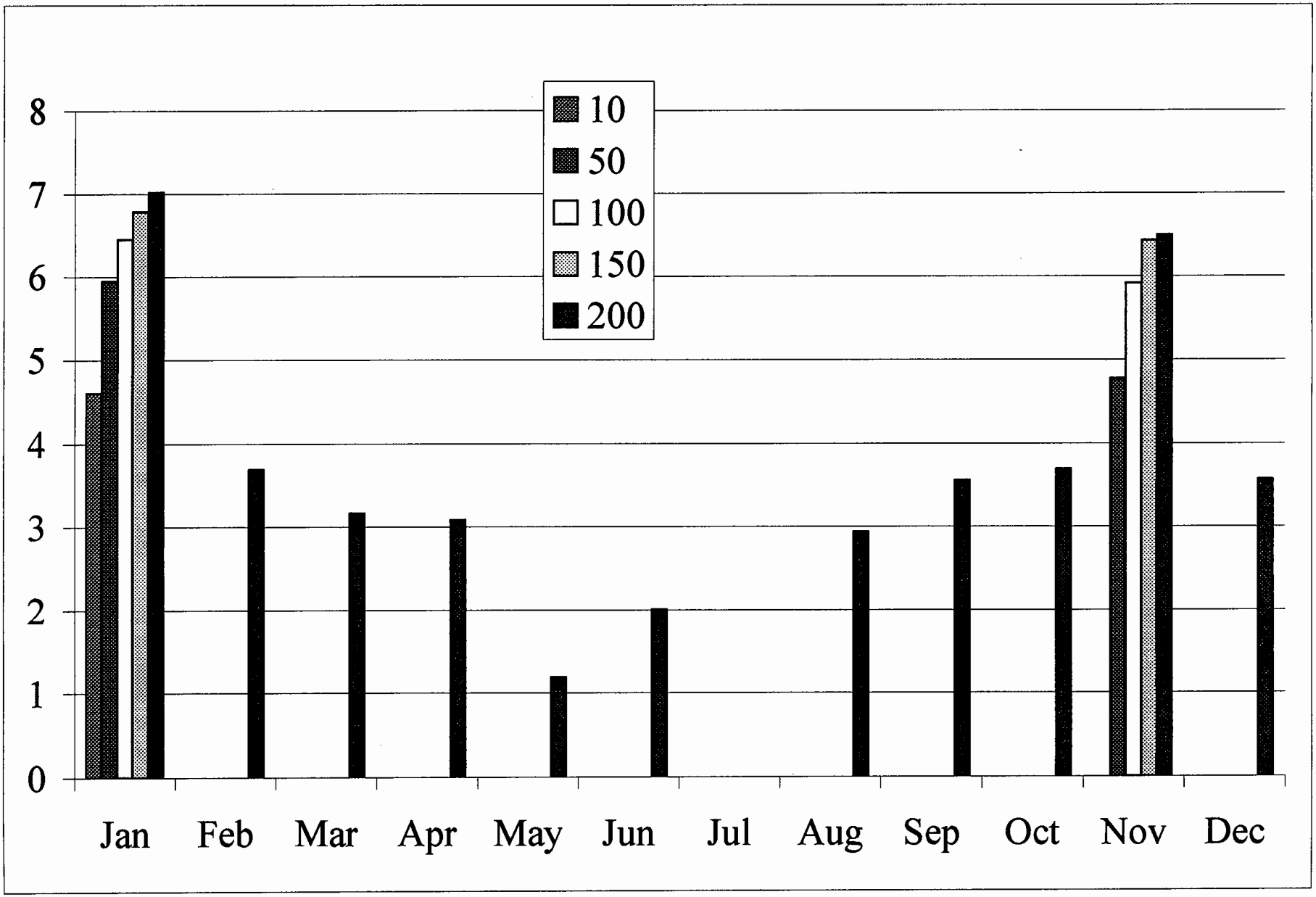
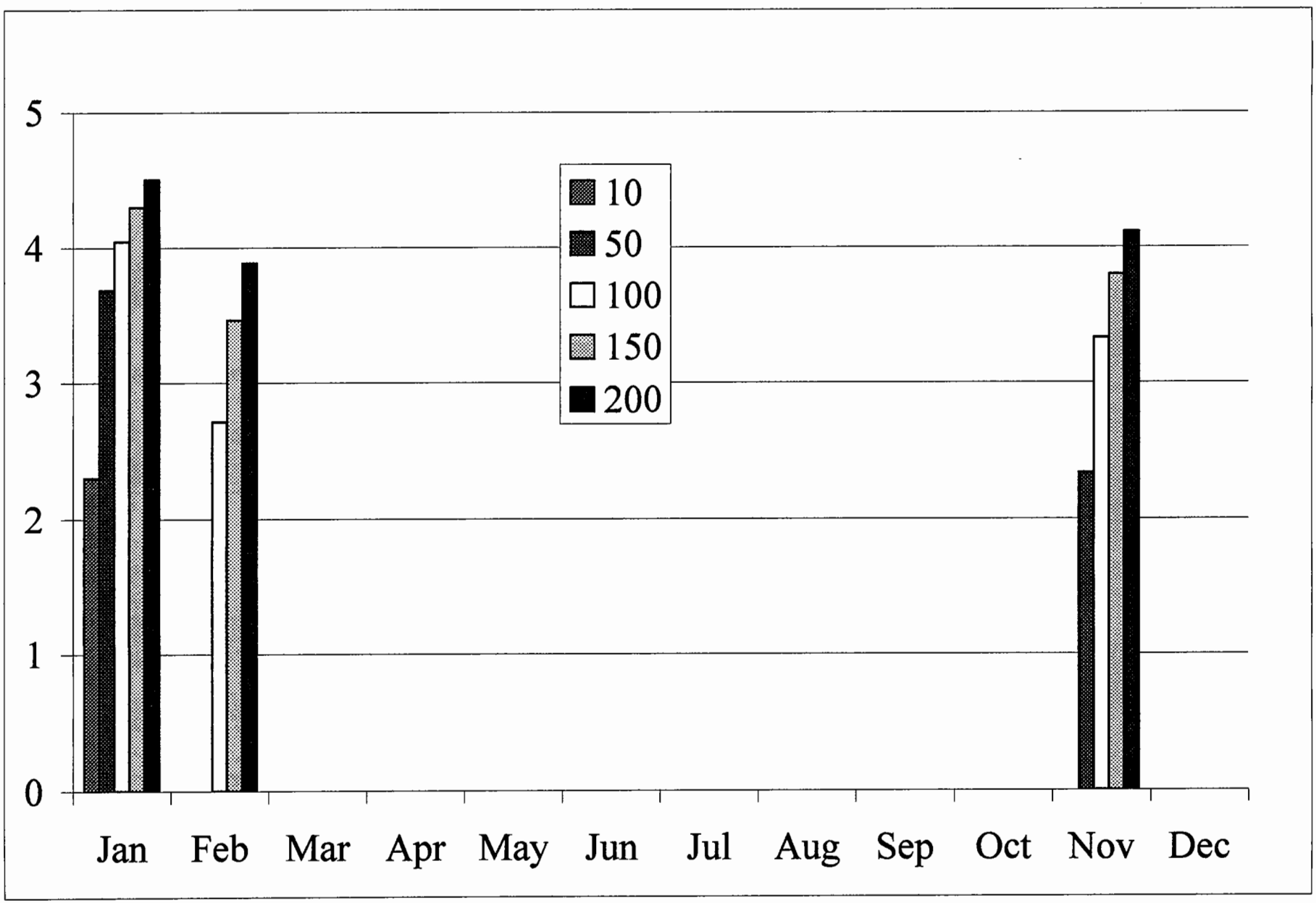


Figure 3.1(b): Optimal annual production profile (1995 basis)



APPENDIX C

Legal and Regulatory Aspects of Site Selection

Ken Riaf, Esquire
Gloucester Aquaculture project

Coonamessett Farm

Executive Summary

If one were setting out to design, from scratch, an equitable and efficient system for the siting and conduct of an EEZ based scallop mariculture industry, it might bear little resemblance to the one currently evolving. Although there are aspects of the present system that are logical and, at times, serviceable, it has neither the elasticity nor durability that a purposely designed, policy-driven system would provide. As a result, the existing mechanisms, cope with, rather than direct and channel the gathering energies of our emerging open ocean farming industry in the United States.

Pounding the square pegs of EEZ mariculture ground rules into the round holes of fishery management could shower regulatory splinters in the path of this tenderfoot industry, impeding its progress and direction. A secondary, but equally important fallout from this unlikely fusion of mariculture management into existing fisheries administration will be the need to continually amend and revise regulations. The result, an endless flyswatting at confounding issues which, had policy consensus and well-tailored law been pursued at the outset, could have been averted.

In the absence of clearly stated policy objectives a meandering patchwork of ever shifting uses and disputed occupations may emerge at-sea to hinder what might otherwise be an orderly and productive industry expansion. Siting policy should, in certain instances, discourage mariculture activities that do not advance the most beneficial use of the EEZ. But policy can also drive forward economically viable well engineered and environmentally responsible ventures that do not compromise the interests of other users or the public-at-large.

Examples of issues raised in the current regulatory context range from the ownership of privately spawned scallop stock, legally landed from managed fisheries but grown-out on private leaseholds, to days-at-sea assessments for aquaculture activities that do not involve the capture of fish or shellfish. Exemptions for shell size, bycatch, possession limits, transport and transfer,

off loading, gear configuration, crew size and wild stock settling on leased bottom would require on-going consistency review.

In contrast to scattered site placement, dedicated enhancement and cultivation sectors would, by the very nature of their location and the rules governing their use, be predetermined to conform to all pertinent policy considerations including navigational standards, environmental regulations and the legitimate needs of preexisting users.

Failing to corral EEZ mariculture in proscribed and pre-approved areas will add to the checkerboarding effect of present administrative closures, raising tensions across industry lines, as well as between resource stewards and users. Given the potentially immense area of growth conducive sites in the EEZ, there is a need to sculpt that territory into sensible and legally recognized districts. Critical to any new legal framework is the need to clearly define rights via regulation and protect them against interference.

Notwithstanding the diligent efforts of those who have wrestled with the many and complex issues that open ocean shellfish mariculture presents, the time is appropriate to examine alternative regulatory mechanisms. Regulation of EEZ mariculture provides a new and unique occasion for resource managers and interested parties to reshape a spectrum of inherited, often discordant, concepts in the allocation of resources held in the public trust.

Shellfish mariculture policy can lay the foundation for building a broad based industry of small and moderate sized operators working in sanctioned areas under a strict yet fair body of law. This section of the report seeks to interpret the lessons of the Westport experience and highlight considerations that would aid in future policy development.

The Westport Scallop Project

Anatomy of a Proposal

The attached chronology (Appendix A) outlines the regulatory genesis of the Westport Scallop Project which proposed, and was granted permission, to conduct at-sea experiments in an area authorized by the National Marine Fisheries Service (NMFS). In December of 1994 proponents were directed to prepare draft fishery regulations in the form of an amendment to the Fishery Management Plan, hereafter FMP. The amendment was to contain all necessary regulatory requirements that could be adopted by the New England Fisheries Management Council, hereafter the Council, to allow the project to move forward.[1] Designated as Amendment #6, the draft set out the reasons for, and the particulars of, the proposed enhancement area. Detailing the preferred alternatives to the then existing sea scallop FMP, Amendment #6 presented extensive environmental, economic, social and legal analysis.

Public hearings held by the Council on the proposed amendment brought to light some user conflicts and resulted in modifications to the site's final coordinates. Information gathered at the hearings helped minimize the incidence of potential conflicts. The amendment was eventually adopted by the Council creating the Scallop Experimental Fishing Area (SEFA).[2]

Subsequent Events

On September 23, 1998 the Council approved a framework adjustment process to facilitate the approval of aquaculture projects in the EEZ. This mechanism would obviate the need for a full plan amendment, recognized to be a more stringent and lengthy process. This truncated approach attempts to process requests to situate in federal waters in an expeditious manner, and it does so but only as compared to the full amendment process. Significant burdens of proof still remain upon the proponent to demonstrate the overall efficacy of

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[1] 12/7/94 & 12/5/94 NEFMC memos.

[2] 50 CFR part 648 § 648.56 (a) (1).

the project consistent with the Fishery Conservation and Management Act, hereafter the Magnuson Act. Specifically, the proposal must establish acceptable biological, social and economic impacts, compatibility with existing uses, along with proof of the applicant's technical/economic resources to implement the proposal. These requirements, while logical and terse, will necessitate great exposition.

From the proponents perspective the Westport project presented unique issues of first impression and received creative administrative responses. The process which existed at the project's inception transformed itself from a linear/chronological one in favor of a more flexible system. Presently, the Council, via its Aquaculture Committee, is developing an additional management tool in the form of a pre-application process to screen prospective projects. Under this plan applicants would be presented with the option of submitting a pre-application. This process, considered informal, would review the proposed project from several aspects simultaneously to determine its viability prior to the applicant engaging the formal review process which triggers specific time lines and hearing requirements.

Applicants would be encouraged to partake in the process at the pre-application stage in order to obtain feedback and modify the project accordingly if necessary. The traditional process of obtaining project review and approval directly from the Army Corps of Engineers (ACOE), Environmental Protection Agency (EPA) NMFS and the Council, is still available to the prospective culturalist wishing to forego pre-application. The agencies above which now meet approximately every four weeks would review and critique pre-applications as they were received.

The applicant's chances for ultimate approval are increased it is suggested if, modifications are made to the project based on agency recommendations generated in the pre-application process. During this stage user conflicts would be addressed in anticipation of public hearings in the hope of averting last minute surprises that could scuttle an otherwise approvable proposal.

Regulatory Authority

Jurisdiction
If aquaculture is fishing, is fishing aquaculture?

Some have argued that there exists a legal basis for the Regional Fishery Management Councils (FMC's) to regulate EEZ-based aquaculture. This opinion is drawn from interpretations of selected definitions found within the Magnuson Act, as well as other statutes, such as the Vessel Documentation Act that are said to be construed *in pari materia* , i.e. constructed together.

An examination of the Congressional Record during the dates of consideration and passage of the Magnuson Act, does not support the proposition that it was the intention of its framers to regulate EEZ based mariculture. The legislative history does not contemplate the role of FMC's in this area and it would strain the plain and unambiguous record of legislative intent to suggest the contrary.[3]

Proponents of Council jurisdiction suggest that "harvesting" as defined in the Magnuson Act was intended to encompass both traditional fishing and mariculture activities. This may be an over-reading of the statute. Is mariculture, governed by fishery regulations, a co-equal fishery entitled to equal use rights? The drawbacks of this logic multiply as the number of exceptions for shell size, bycatch, possession limits, transport and transfer, off loading, gear configuration, crew size and so forth, grows. Treating mariculture as a fishery and carving out exceptions along the way will require a new, and seemingly untenable, set of suppositions. Arguably it might imply that mariculture and fishing interests, equally footed in law, would be equally obliged to identify and justify their respective resource uses to each other so as not to interfere with one another's operations in federal waters.

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[3] Legislative History of the Fishery Conservation and Management Act of 1976 GPO 1976 Compiled Legislative History KF 1170. A314 A15 1976. SuDoc Y4 C73/2: F53/13

At a proliferating number of scattered cultivation sites this scenario would create ongoing use conflicts as the two activities vied for space.

Aquaculture is a husbandry, farming and culturing process that invests in site preparation, planting, nurturing and harvesting of a crop. Harvesting is an aspect of the process, and it is not, as some suggest, a method of taking fish analogous in any way to commercial fishing. Legal definitions do not abrogate the fact that nature made wild game and fish to be unclaimed by any one person in great distinction to farmed animals in possession of one and cultivated. The two activities are in root and essence, different. Commercial fishing has always been an extractive industry which invests in dedicated harvesting machinery. From a common resource, for free, without replanting, the fisheries take. They are not managed by a national permitting system like public lands which require fees for: mining, grazing and permits for timber and logging. Instead of aquaculture being conformed to rules governing commercial fishing it could be that the wild fisheries need alignment with modern standards for the beneficial use of public resources.

If aquaculture were to be regarded as a fishery for the express purpose of asserting jurisdiction, it would also, in fairness, need equal standing and representation at the Council level. The absence of meaningful Council representation is another indication that the Act did not intend to confer jurisdiction or authority to FMCs to regulate EEZ-based mariculture, outside of commenting on potential adverse impacts to managed stocks. The Council has, to its credit, made significant strides to create balance through the empowerment of an Aquaculture Committee. However, the fair allocation of space in the EEZ requires a level of objectivity from the FMCs that may be difficult to attain.

The Council's convening of an Aquaculture Committee was, in some measure, a response to issues raised by Westport. The committee's good efforts to modify existing FMP's, by integrating aquaculture sections into their respective frameworks is the type of detail work for which the committee is well suited. As an initial point of contact for prospective culturists the aquaculture committee is well situated and comprised to coordinate an analysis and, in limited instances, make decisions that determine licensure.

What remains unclear in the present cross cutting jurisdictional system is exactly what agency is the ultimate arbiter of site determination. The Council's authority to oversee site placement is subject to the determinations of ACOE, EPA and NMFS regarding structures, discharges and fishery policy respectively. However, the Council can override ACOE, EPA and NMFS approvals by denying site access. The seeming contradiction of being subject to and independent of agency determinations is, to some extent, addressed by the newly developed pre-application process.

During the Westport Project's siting procedure it was discovered that a commercial fisherman's tow traversed the proposed site. The Council, by not approving the project until the site was relocated, demonstrated the shortcomings of a linear approval method wherein projects could be sidetracked very late in the process. The pre-application procedure was developed in response in order to give the applicant and the regulatory bodies an opportunity to view the project in its totality as opposed to piecemeal.

Until such time as agency roles are clearly defined FMCs should, prior to examining the merits of a given project, determine whether they have jurisdictional authority. In this way mariculturists could, as a threshold issue, present reasons why a particular project might lay beyond the FMC's purview.

A prototype factor analysis would answer the following:

1. Does the proposed use entail the cultivation of a managed species?
2. Does the proposed use impact or threaten a managed stock?
3. Does the proposed use interfere with existing FMP's or amendments?
4. Does the proposed activity interfere with permitted uses of mobile gear?

The burden of proof is squarely on the FMC's to establish jurisdiction and detail how and why the proposed use is at odds with their duty to manage a given wild fishery. If the answers to the questions above are in the negative then jurisdiction should not, under the present system, be presumed.

To further confound matters the Council has been placed in the unenviable role of advisor, referee and judge in matters pertaining to EEZ-based mariculture. In the present configuration it can counsel applicants on how to refine and improve their proposals, it can moderate adversarial hearings and it can sit in final judgment on a proposal's fate.

The law that purports to confer FMC jurisdiction over EEZ-based mariculture has yet to be tested. Fishery Councils, it can be argued, wield great authority in their narrowly defined role as regulators of managed species. Whether FMCs should be cast in the role as guardians of the public trust in matters concerning mariculture has not been fully contemplated. As presently constituted it cannot be expected that they may fairly adjudicate property rights in the EEZ.

Factor Analysis
What are the goals of scrutiny?

To apply the appropriate level of review to the various types of sea scallop mariculture there needs to be a classification system that categorizes proposals. The Aquaculture White Paper and Strategic Plan (Massachusetts Coastal Zone Management 1995) provides a good model for this purpose. The siting considerations and monitoring criteria specified there were drawn from protocols established in Maine and the state of Washington. For purposes of this report two categories are germane.

Category I: No Structures/ No Additions/No Discharges

Category I operations are prototypically shellfish bottom culture efforts. Facilities under 10 acres are subject to Programmatic General Permits issued by the ACOE. These permits assess whether the facility will impact on the environment and or pose navigational concerns.

Category II: Structures/ No Additions/No Discharges

In Category II configurations use of the water column is implied. These facilities with their suspended gear, whether buoys, lantern nets or arrays,

naturally trigger a higher level of review due to navigational and engineering concerns and possible interactions with endangered species.

If jurisdiction is established, the proposal would then be categorized as either a Category I or Category II project. Preferences or priorities could be used to promote resource preservation/enhancement projects, or experimental activities as well as certain commercial efforts under cooperative management. Having fixed or pre-approved mariculture districts or no-take Special Management Areas (SMA) in place and ready to accommodate approved projects would have several advantages. Licensure in these certified areas with fixed lease sizes, long term tenures and pre-determined engineering standards would advance the policy objectives below and the needs of culturists for security and stability. Districts would be selected and managed to:

- Support the growth of the selected species.
- Safeguard protected species.
- Minimize interferences between competing users.
- Minimize interferences among similar users.
- Discourage claim staking through strict lease and ownership restrictions.
- Favor cooperative ventures and commercial fishing license holders.
- Promote non-exclusive use and long-term tenures.
- Compensate the public for use through leases or administrative fees.
- Facilitate monitoring and enforcement.

Site Selection

Considerations
Is there optimal placement?

The elements that make for a suitable mariculture site are not limited to the area's growth conducive characteristics and size. Sites must be monitorable from both an environmental and security standpoint and they should not unduly interfere with traditional uses. Sites must be accessible to service vessels of small size and range. In addition to the mandatory legal requirements placed on a proposed occupation in navigable waters, there are a host of biological, economic, engineering and social considerations in the selection analysis.

There is no single indispensable siting factor that must precede all others in order to assure optimal placement. Instead essentially equal elements are overlaid to reveal potential site coordinates. Perhaps foremost among these equal considerations are the site specific environmental conditions that will either support or hinder the growth of the subject species. Locating a prospective site at an otherwise acceptable locus, but where growing conditions are unfavorable is neither desirable nor ultimately productive. A threshold siting consideration must analyze and determine where the species will grow successfully. This may, as in the case of the sea scallop, constitute vast stretches of ocean where the species has taken hold and supported commercial fishing activities in the past. It may also include areas that would support growth but due to fluctuating conditions (i.e. spatfall, predation) have not witnessed repeated commercial concentrations.

With regard to site dimension requirements, a recent revenue analysis of acreage under production suggests that a ten acre cage culture site, properly configured, can support between 1.2 to 2.0 million juvenile scallops depending on stocking densities. Current ex vessel prices of $8.00 per lb and 40 meats per pound were used to arrive at gross revenue projections of $400,000

for 2 million shucked scallops. These revenues would only be realized in the third year based on growth projections of a 25mm juvenile.[4]

Looking Back
What lessons?

Several countries have embarked on reforming and restating their legal, administrative and social policies in an effort to increase mariculture production. To fully understand those reforms would require an account of local sea tenure systems too extensive to detail here. These formal and informal - private and cooperative; institutions, systems and customs have historically determined rights to, and uses of the sea.

Underpinning our domestic allocation methods are similar concepts of common property stretching back to colonial times. The strong sentiments that prevailed in our young nation with its abundant resources and small population favored free taking and open access rights in both wild game and fishing. (McCay 1989). Those sentiments were in reaction to enclosures of the commons taking place in Tudor and early Stuart England. There agricultural and mechanical advances, together with growing food demands, highlighted the inefficiencies of an antiquated, wasteful and comparatively unproductive open field or commons system. The old ways were viewed as incompatible with mechanical and industrial improvements to farming methods.

England's Enclosure Acts essentially confiscated the commons under the guise of the need for improved production practices. Although reallocations were attempted to compensate the dislocated, the land grab that ensued heaped the benefits of these great improvements and clearances on large private owners. In this way the advantages to be gained were intercepted, and deflected from the community.

We now stand at a point in time similar to that which brought about revolutionary changes in terrestrial farming and food supply. In the marine environment new modes of production, specifically EEZ mariculture,

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[4]Production Strategies for Sea Scallops FIG grant #NA66FK0080.

challenge our inherited notions and raise questions about the need for demarcated culturing areas. Contemporary circumstances differ much from those following the enclosures with its abrupt termination of ancient rights to work the commons for private gain. Still, the long term negative social and economic repercussions of those clearances would advise us, to more equitably dispense the profits of progress.

Foreign Jurisdictions
Who's doing what to who?

Current trends in mariculture siting from foreign jurisdictions; including Japan, the European Union, New Zealand and Tasmania suggest that site selection by consensus is in fashion. In Japan, underlying the policy goals of activating community economics and increasing individual income there is a vital and pressing need to effectively utilize suitable areas in the cause of food production. Because of its long traditions and singular codes concerning associations of like minded people bound in honor, justice, benevolence and compassion the Japanese model will likely remain unique to Japan. However, our comparable associations such as cooperatives, combines and granges, could join with policy makers in shaping a process directed at increasing production, widening participation and stabilizing supply in a more formally demarcated sea.

In France, the fisherman's association in Brest operates a hatchery that produces 12 million scallop spat a year. Each scallop fisher pays FFr 15,000 ($2,500 US) for an annual license to dredge the enhanced beds. This money from 90 boats, plus help provided by local authorities, funds the scallop enhancement effort. Recapture rates average 22-25%, a figure which makes the program economical and gives a boost to this local fishery in Brittany (Edwards. 1998, FFI). These activities take place in areas set aside for the specific purpose intended and illustrate demarcation by consensus and for profit.

Bringing fishermen and others into the process in order to establish boundaries and grid references is also taking hold in New Zealand. There leases and licenses issued under the Marine Farming Act must comply with

plans set out by the regional councils (Oakley & Bonnington 1995). Certificates of compliance with these plans precede the issuance of farming permits. This means that a compulsory and detailed application forces applicants to consider alternative methods, the mitigation of harmful effects and monitoring measures. Applicants are also encouraged to consult and hold meetings with those affected by the sites.

In the New Zealand model the process is bifurcated. First a certificate of compliance is obtained for the erection of structures in the coastal marine area, which gives the holder the right to occupy space. Second, a marine farming permit (MFP) is required in order to obtain rights to raise or sell fish. The MFP considers the effect of the farming activity on the sustainability of the fishery resource as well as the effect on fishing generally. Permits cannot be issued if the effects would be adverse. This formal system is similar in some respects to our ACOE, NMFS, FMC review, one for structure/navigation, the other for species suitability/compatibility. If US EEZ mariculture activities are ever to be conducted in designated areas the New Zealand model provides guidance in assuring compliance to uniform standards and practices.

Tasmania's model underscores the complexities inherent in any plan to grant exclusive occupation of a moving fluid (Thompson 1996). Alienation of submerged lands which have been in the public domain is certain to arouse the deep passions that come with strongly held convictions. Tasmania's experience is instructive regarding mechanisms which give back to the public something of what has been lost in the way of common property in the form of resource rents. The rents are structured in a manner so as to not overburden or overtax the industry up front, but rather defers rents until the industry is on its feet at which time fees are gradually raised.

Although rights to occupy areas in the common or public domain has yet to be tested either politically or legally in Tasmania, they are moving forward to clarify government policy and access public attitudes. The issues are familiar to us: loss of public seabed, the economies of size, ownership and enforcement of rights. The solutions are also familiar and, of course, greeted with general skepticism by most everyone who is not a mariculturist. Before Tasmania's scallop culture industry can become a reality these issues must be

addressed foursquare. Tentative steps taken to codify reseeding leases (enhancement) triggered a rush of claim staking that we here can view as an outcome to be avoided.

Tasmanian law confers exclusive occupation rights to waters specified in permits granted. Similar to language in Westport's Amendment 6 to the Scallop FMP, it does not regard hook fishing, recreational and commercial or pot/trap fisheries as constituting an interference with those exclusive rights, but does specifically prohibit other interferences. Notable among the attributes of this system, conducted in discrete lease or permit areas, is the clear distinction between enhancements and contained culture structures. Whether enhancements or contained culture, if conducted by traditional fishermen and viewed as merely an extension of fishing activity, mariculture is more likely to find community attitudes accommodating than if corporate interests are perceived to be speculating on a large scale (Thompson).

Foreign jurisdictions, although somewhat further along on the road to resolving sitting issues are still wrestling with the conflicts that are a common feature of commercial enhancement and contained culture systems. They continue to balance the social costs of the unfettered "take" mentality found in the capture fisheries with the husbandry of mariculture.

Recommendations and Conclusions

In the future, all ocean users will know the extent of their allowable catch and the limits of their respective ranges. But for now, any system for allocating mariculture space in the EEZ that challenges well established conventions will encounter criticism and resistance. The manner in which that system is arrived at, will be as important as the system itself.

The highly sophisticated formal and informal marine-based tenure arrangements of the past were themselves the inventions of users and stewards wrestling with the allocation issues of their times. History instructs that any process which excludes all but policy makers who carve up ocean for distribution, will not endure for very long.

1. **Recommendation**: Develop policy objectives and strategies that include:

- Nearshore site accessibility for small scale operations.
- Incentives to commercial fishermen to lease mariculture sites.
- Incentives to develop cooperative approaches to mariculture projects.
- Design of an enforcement and monitoring program.
- Standardized stocking requirements and certifications.
- Limitations on the acreage of individual leaseholds.
- Limitations on aggregating acreages.
- Establishment of public/private site security measures.
- Setting engineering standards at approved sites.

Unfortunately, those manning the administrative and regulatory parapets, and those in policy positions, are now constrained by the ambiguities of a makeshift system. The challenge is to lay an axe at the root of the problem before it grows further. The present policy course will likely create a meandering patchwork of ever shifting sites and disputed occupations unknowable to other users and changeable from day to day. Policy vacuums have a way of slowing development and fostering tensions among the regulated, administrators and the public at large. For those reasons alone the process should move forward more deliberately and inclusively.

Policies and programs that foster cooperation through the mediation of conflicts between the traditional fisheries and mariculturists will advance the mapping of defined culture districts and aid resource managers.

2. **Recommendation**: Identify suitable Category I & Category II mariculture districts.

- Using GIS and available data, map growth conducive sites that do not infringe on productive areas but are accessible to both nearshore and offshore operators. These areas would be suitable for bottom cultures, contained cultures and limited water column occupation.

3. **Recommendation**: Designate identified No-Take and or Gear Restricted SMA's.

- Aquaculture sectors as part of larger fixed gear districts .
- Aquaculture sectors in proximity to administratively closed areas .

Taking a proactive approach to siting by establishing sanctioned districts for specific low impact facilities will, in the long term, spur activity, reduce ambiguity and uncertainty and gain administrative efficiencies. Allowing non-exclusive, small scale, bottom cultures, contained cultures, and enhancement efforts to operate in clearly defined areas and under regulatory supervision is a logical, attainable and desirable policy goal. It advances compelling societal needs and interests in food production, job creation, community economics and resource management.

The recommendations in this section advocate for a structured, appropriately scaled and environmentally responsible EEZ based bivalve mariculture. They seek to encourage wide participation through long term leases in sanctioned and protected areas. This approach is aimed at limiting entry in a way that discourages pooling of acreage and sets aside areas dedicated to small scale efforts.

4. **Recommendation**: Determine a model lease that advances specific policy goals through restrictions on site use and occupation.

- Establish rent schedules, separation distances, gear/engineering specifications. Set minimum lease terms (30-35 years) renewable and/or terminable 2 years prior to expiration.

- Rents generated ear marked to compensate displaced users, establish training programs, R&D, site patrol and law enforcement.

5. **Recommendation**: Adopt siting and lease section into the National Aquaculture Plan.

- Convene policy experts and technical advisors to identify and catalog sites for future development.

- Define agency roles regarding siting in clear and unambiguous terms.

In conclusion, a key to unlocking the potential of open ocean mariculture is that its privilege to conduct itself in public waters be governed by regulatory standards that reflect a fair, rational and enforceable public policy. By creating a system that sets out the exact locations for and conditions of long-term mariculture leases, regulators will be positioned to insure that the beneficial use of the public's resources is given a high priority while at the same time the industry is permitted a fair opportunity to succeed. Allocating space for EEZ mariculture is a ripening political and legal issue. Unfortunately, mariculture's continuing dilemma is that it cannot obtain a foothold in the EEZ because it has no constituency and it has no constituency because it cannot obtain a foothold in the EEZ. This difficulty may be due in part, to the industry heavy composition of the self-regulating Council system. Fishery Councils have in recent times been remonstrated for yielding to industry concerns, asking these bodies to objectively regulate an arguably competitive industry may be too hopeful.

Although a FMC could prohibit specific fishing activities at a site of the applicant's choosing, the FMC's ability to confer rights is still unsettled. Without a firm legal basis to do so, the Council and its Aquaculture Committee are relegated to filling the policy void by using their narrow albeit important powers

to rule on where sites cannot be located. By seeding a plot in the middle of a veritable dustbowl the Westport project tested the system's checks and balances. Armed with its grass roots knowledge of specific commercial tows, fish habitats and other pertinent resource information, the Council served as an effective check to inappropriate site placement. And, to its credit the regulatory process did evolve to meet many of the challenges posed but the need for larger, systemic solutions remains.

Designing an access system that is opened to many small-scale operators harvesting an improved resource in order to increase individual incomes and activate community economics will prove challenging. As we join other countries facing insecurity over sources of supply in the capture fisheries a consensus needs to emerge about mariculture's form and direction. Seeking that consensus and advancing it should be high on the list of next steps.

Appendix A

Westport Scallop Project Chronology

Date	Activity
September 1993	Planning
August 22, 1994	FIG 1 Proposal
August 25, 1994	ACOE permit request
August 25, 1994	Letter from C. Goudey to NEFMC requesting opportunity to present project to full Council
August 25, 1994	ACOE area closure Application
September 1994	Presentation to full Council
September 26, 1994	R. Smolowitz/ CG meet w/ ACOE & NMFS
October 6, 1994	CG Memo / Project Update
October 7, 1994	RS meeting at M. Vineyard lobstermen
October 12, 1994	Presentation to Scallop Advisory Committee
October 13, 1994	Presentation to Scallop Oversight Committee
October 18, 1994	Presentation at Cape Cod Farm Bureau
October 21, 1994	CG Memo / Project Update
October 24, 1994	Pat Fiorelli memo to ad hoc Aquaculture Committee
October 26, 1994	Full Council at Danvers
November 2, 1994	CG Memo / Project Update
November 23, 1994	CG Memo / Project Update
November 1994	Presentation to Interspecies Committee
December 1994	Council Vote
December 19, 1994	Submit S-K Proposal
January 1995	ACOE permit issued
January 6, 1995	First framework meeting at Gloucester NMFS/NEFMC
January 9, 1995	Second framework meeting at CLF Boston
January 10, 1995	Draft Amendment
February 15, 1995	Submit Amendment #6 Draft
May 5, 1995	FIG #2 Proposal
June 1995	Presentation to Aquaculture Committe
August 23, 1995	Letter from R. Smolowitz to Council requesting Council hearing on project

September 12, 1995	Letter from R. Smolowitz to Marshall urging Council approval of the project's draft amendment
September 29, 1995	Letter from Smolowitz to Palmer requesting data to write draft FMP Amendment for enhancement project
November 6, 1995	Scallop O/S Committee reviews project plan of work
December 19, 1995	Project Participants Meeting Seaport Inn, Fairhaven
December 1995	Council Vote
December 1995	S-K proposal submitted
January 19, 1996	Council Public Hearing, Woods Hole
January 25, 1996	NEFMC / Amend. #6 Committee Report
February 7, 1996	Westport Sidescan survey
February 14, 1996	Letter to Lou Goudreau NEFMC / Goudey
February 26, 1996	Letter to D. Marshall / R. Smolowitz
February 27, 1996	Scallop Committee Vote
March 2, 1996	Maine Fisherman's Forum
March 15, 1996	Draft response to NEFMC Brennan Report
March 20, 1996	Special scallop PDT meeting to discuss experimental fishing requests
April 4, 1996	Presentation at Kennedy Library U Mass Urban Harbors
April 8, 1996	Experimental fishing permit request for permission to collect and transport scallop seed
May 1996	Federal Register comment period closed
June 3, 1996	Letter from H. Mears to S. Hendricksen requesting project changes before an experimental fishing permit can be issued
August 26, 1996	Letter to Dr. Rosenberg re: Experimental Fishery Request
September 11, 1996	Letter from Pat Kurkul re: scientific research classification/alternative site
July 22, 1996	Letter to Dr. Rosenberg re: Experimental Fishery Request. Soren Hendricksen
July 22, 1996	Letter to H. Mears requesting changes to the project work plan and budget made in order to meet requirements and delays placed on the project by the council review process
September 29, 1996	Resubmit experimental fishery request letter to retain small scallops for research activities
September 30, 1996	NMFS - Meeting at Gloucester with Director Rosenberg

November 22, 1996	Letter from A. Rosenberg to J. Brancaleone notifying NEFMC that Amendment was approved
December 19, 1996	NEFMC - Aquaculture Habitat Committee Status presentation
January 8, 1997	Experimental Fishing Permits issued

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Abbreviations

ACOE - Army Corps of Engineers
CFR - Code of Federal Regulations
EEZ - Exclusive Economic Zone
EPA - Environmental Protection Agency
FCMA - Fishery Conservation and Management Act
GIS - Geographic Information sysytem
NMFS - National Marine Fisheries Service
SEFA - Scallop Experimental Fishing Area

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APPENDIX D

Final Pathology Report

SeaStead Project

Roxanna Smolowitz, D.V.M.
Veterinary Pathologist

Coonamessett Farm

A REVIEW OF DISEASES OF *Placopecten magellinicus.*

BY ROXANNA SMOLOWITZ, D.V.M.

The number of known diseases of *Placopecten magellinicus* are few. Only rarely have diseases been shown to significantly affect either a cultured population or a wild population of scallops. A review of possible diseases that may affect the outcome of any culturing effort follows.

A bacterial species caused numerous cases of systemic infections resulting in abcessation (brown spot) in wild sea scallops from various locations from Maine rivers during the late 1970's to mid 1980's (Getchell, 1991; Bower et al., 1994). Abscesses in the adductor muscle resulted in unmarketable meats. Researchers proposed that the disease was responsible for weakening of the muscles and debilitation leading to death. 5-10% of the animals from any one site were infected. The causative gram positive bacteria was never cultured or identified and has not been subsequently reported.

Basophilic intracellular colonies usually identified as belonging to a broad grouping of organisms, termed *Rickettsia*-like and *Chlamydia*-like, infect the epithelial cells of the digestive gland, mantle, and gills. They are commonly identified when examining histological sections of scallops. Identification of these organisms in tissues sections is usually considered an incidental finding and not cause for concern. However, one report from 1983 in seas scallops indicated a possible link between a severe infection of the gills and degeneration of the adductor muscles in the same animals resulting in mass mortality (Getchell, 1991). Subsequent research has shown that the *Rickettsial*-like infection of the scallops did not cause the muscle degeneration. However, the infection may have contributed to dehabilitation of the scallops allowing other pathogens to invade.

Trichodina sp. (peritrich ciliates) have been identified in on the gills of seas scallops (Getchell, 1991; Bower et al., 1994; Lauckner, 1983). While they are generally considered a nonpathogenic commensal organism, this author has seen significant gill necrosis and resulting mortality associated with overwhelming Trichodinal infestations in sea scallops held in a laboratory based maintenance facility

Algal infections have been observed to cause green proliferative granulomatous lesions on the eyes, mantle and tentacles of wild sea scallops on one occasion (Leibovitz et al., 1984). In another incident, *Coccomyxa parasitica* was found to be parasitic on cultured seas scallops held in shallow water with high light intensity in northern latitudes of the eastern Canada (Naidu, 1971; Getchell, 1991). In that incident, mantle morphology was disrupted by the algae and the reactive inflammatory response was mounted by the scallops. Animals held for long periods of time showed warped valve edges and extra shell margins.

Intermediate forms of many different types of cestodes, trematodes and nematodes can be found in the tissues of most bivalves, including sea scallops. Heavy systemic infections or

infections in the adductor muscles or gonads can cause severe dehabilitation in bivalves.

However, heavy infestations of sea scallops resulting in high morbidity and mortality have not been recorded to date.

Shell-boring polychaetes (primarily *Polydora* sp.) infestations produce the proliferation of mud blisters on the shells of seas scallops. Infestations by *Polydora* may result in weakening of the shell at the hinge and poor adductor muscle condition and attachment. *Polydora* blisters can also result in fragile shells that are less resistant to damage by crabs and lobsters. The polychaetes are thought to cause the formation of linear shell deposits that results in irregular or poor closing of the shells and thus dehabilitation of the scallop. Fortunately, heavy infestations are needed before these sequella will occur.

Clionid sponges burrow into the shell from the outer surface and honeycomb the shell with straight, small holes. Honeycombing results in substantial weakening of the shell and increased success of predation of the bivalves by other predators. Infestation of the shell overlying the adductor muscle by *Clionid* sponges that have burrowed thought the shell into the underlying muscle can result in "dark meat" (an inflammatory response) present on the surface or in substance of the muscle. This brownish discoloration reduces marketability.

Infestations of the inner shell edge by the colonial hydroid, *Hydractinia echinata*, has been associated with interference of the normal mantle activities, and shell deformities (Merrill, 1967). The scallops thus infested "secreted a new shell edge within the existing perimeter and bypassed the hydroid colony (Getchell, 1991). Mortalities have not been associated with this infestation.

Pinnotheres maculatus (pinnotherid crabs) live in the mantle cavity of sea scallops as well as other bivalves. These usually symbiotic crabs, occasionally cause dehabilitating disease. When the crabs attain large size or are present in high numbers they cause pressure necrosis and direct physical injury resulting in emaciation and damage to the gills, palps and mantle (Smolowitz, personal observation).

In summary, disease of sea scallops are of minor importance. Conditions identified appear to be widespread in animals throughout the Eastern Coast. The lone exception is occurrence of bacterial disease of scallops collected from the Maine rivers in the 1970s and 1980s. Therefore, restriction of sea scallop movement in the northeast (with the exception of animals from the rivers of Maine) based on spread of disease is not warranted at this time. Most important to the successful deployment of wild seed scallops in culture beds is the condition of the sea scallops when they are deployed in the culture site. Trawling damage and on board tank holding times should be kept to a minimal in order to make redeployment of scallops at the culture site a success.

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SUMMARY OF THE SCALLOP DISEASE EVALUATIONS FOR WESTPORT SCALLOP PROJECT

A sample of sea scallops was examined from each of four collection times during the project. Animals in each sample were examined grossly, weighted and measured. Unusually findings were recorded and photographed when appropriate. Tissues were removed and fixed in 10% formalin in sea water, processed in paraffin, cut as 6 μm sections and stained with Hematoxylin and Eosin. Stained tissues were examined on an Olympus BH-2 photomicroscope and results were recorded.

Sample Group 1 (Slides labeled Case No. 9694)

These animals were collected as seed by dragging from lined scallop dredges from Massachusetts Bay in May, 1997. They transported and then deployed on the sea bottom at the Seastead culture site.

Gross Summary:

The animals averaged 60.4 grams in weight and 74.2 grams in shell height. Most animals had 1-3 mm chips at the shell edges (Figure 1A). Three animals showed retracted mantle edges. Two animals had albino shells and two animals had stripped markings. Eight animals showed mild to moderate *Cliona* sp. infestation of the shells (Figure 1C). Gonads of all animals were moderately increased in size. Examination of the gills showed no protozoan parasites or bacteria. Mild acute traumatic shell chipping was identified also.

Histological Summary:

Some animals showed vacuolation and fragmentation of striated muscle (4/25 animals) (Figure 2A). These are early (reversible) signs of muscle necrosis and may have resulted from the trauma of capture and transport, resulting in attempts by the animal to sustain closure of the shells for long periods under adverse conditions.

Three animals (3/25 animals) showed multifocal but variable amounts of inflammation in the adductor muscle associated with vacuolation and fragmentation of the muscle fibers. This is somewhat less than expected due to the high prevalence of Cliona infestation of the shells seen grossly, but may reflect the mild degree of infestation by Cliona (*Cliona* infections did not extend into underlying muscle from the muscle/shell interface).

Some animals showed focally extensive subacute necrosis in the digestive glands (3/25 animals) that was rimmed by inflammation. This was a true anti-mortem change but may result from a lack of water flow and/or capture trauma experienced by the scallops (causing stress, self digestion and probably focal secondary bacterial infections). Such necrotic foci were not identified in other organs of the animals' bodies.

Many animals (7/25 animals) showed rare Rickettsial-like infections of the gills without inflammatory response. Such infections are commonly found in scallop gills from many locations are not considered significant.

Rarely, some animals showed small foci of inflammation in the gills (2/25 animals) (Figure 2B). No parasites were found. It is likely these foci are due to previous trauma and/or bacterial infections. Both female and male scallops showed gonadal tubules in mid-maturation (stage 6).

Sample Group 2 (Slides labeled Case No. 9788)

This scallop sample was taken from animals deployed on the Westport culture site in July, 1997. They showed high mortality (estimated at 60%) when examined in October, 1997.

Gross necropsy summary:

Six live animals were necropsied. Average shell length was 6.8 cm. Average weight was 41.8 grams. 2/6 animals showed albino shells. *Cliona* infestation was negligible. Shell edges were multifocally chipped, but chipping was mild. Mantle edges appeared normal. Examination of the gills showed no parasites or bacteria.

Histological Summary:

2/6 animals showed multifocal mild inflammation in the gill lamellae. No cause was identified. 2/6 animals showed multifocal mild swollen fibers or fragmented and vacuolated fibers in the striated adductor muscle with no inflammatory component. 1/6 animals showed moderate multifocal to confluent mild myositis of the adductor muscle smooth muscle crescent and mixed hemocyte inflammation (Figure 2C). Both degenerate and regenerate myocytes were noted.

Striated muscle lesions were acute and recent and could have result from trauma associated with capture. The subacute lesion of the smooth muscle crescent is interesting. Trauma or stress of handling may have caused this lesion. No inciting cause was noted in either type of lesion. Smooth muscles are responsible for sustained closure of the shell. Lesions of the smooth muscle could result from sustained closure attempted as a result of handling and capture. Striated muscle reacts to close the shell quickly but cannot maintain closure for any length of time. The gonads of all animals were ripe.

Sample Group 3 (Slides labeled Case No. 9922)

These animals were collected from closed beds and transported to the Westport Scallop site were they were deployed on the bottom of he site. Animals examined at necropsy had been held in refrigerated water for 2 days before necropsy.

Gross Necropsy:

Forty one animals were submitted, 20 of these showed gapping. The rest closed their shells upon stimulation. The animals averaged 188.9 grams in weight and 11.1 cm in shell height. Three animals showed loss of large portions of one or both valves. All other animals showed mild degrees of inconsequential chipping on the shell edges. 39 animals showed orange upper valves and white lower valves. Two animals showed yellow upper and white lower valves. Varying degrees of erosion of the outer layers of the upper orange shell valves (and attached algae) were noted. However, only three animals had substantial loss of upper shell surface. The ligament was

broken on three animals (two of which were included in the severe shell loss category). These traumatically induced lesions appeared to be a result of the capture process.

One animal showed a 2 cm length, inward bilateral puckering, midway along the free edge of the hard shell which was associated with abnormal folding of the mantle attached to the puckered shell. The rest of the mantle in that animal appeared grossly normal. It is suggested that some type of chronic bilateral constrictions of the shell occurred at this location.

The gonads of all animals appeared to be well developed (gravid). Nineteen males and 22 females were noted. Some animals appeared to have mildly watery gonads that indicated the beginning of spawning.

Mild multifocal *Cliona* infestation was noted on several animals. However, no *Cliona* lesions were noted on the adductor muscles when shucked. Squash preparations of the gills showed no parasites.

Histological Summary:

15/26 were females. Most animals were ripe (stage 7 gonads; 7/25 animals) or were spawning (stage 8; 6/25 animals). Some spawning females showed early egg formation in the gonadal tubules that indicated a second maturation series of eggs was beginning before the end of the previous spawning cycle. Most males were in stage 7 (7/25 animals).

Several animals showed multifocal mild telangectasis and hemocyte aggregation in the gills associated with mild to moderate epithelial atrophy and or mild hyperplasia. Gill lesions noted probably reflect the recent trauma resulting from dredging and are considered a result of the fishing methods and not a health problem of cultured animals.

One animal showed malformation of the mantle edge that was consistent with the gross lesions seen on the shell edge (see gross report). However, except for focal slight malformation and additional connective tissue proliferation, the mantle epithelium and tissues appeared normal.

Sample Group 4 (Slides labeled Case No. 9939)

Animals were sampled from scallops held in bags on the Westport Scallop Project grant for one year. The entire contents of one bag were submitted. Fifty-five live animals were present in the bag. Also present were 19 scallop valves, 2 crabs, 2 starfish and 4 sanddollars.

Gross Summary:

The free edge of all live scallops (top and bottom valves) showed a shelf or ledge with 1-2 mm medially oriented step between edge of the old and the beginning of the new shell growth. Barnacles were present and had attached on old shell growth and at the step of old and new shell edge (Figure 1B). It is possible that mild detachment of the mantle occurred upon capture and transport to the culture site one year ago that resulted in new growth and slight inward displacement of the new shell. No such shelf or new growth was noted on any of the single valves of dead animals present in the bag.

Six animals had white upper shells. Six animals had distinctly stripped orange/yellow upper shells. Approximately 3/10 animals had mild to moderate *Cliona* infestation on the shells. The inner surfaces of approximately 1/3 of the shells showed roughened irregular to semicircular (but white) surfaces. It is likely these resulted new shell on the inner valve surface laid down in

response to the *Cliona* burrows. Rarely animals showed black/brown blisters on the inner surface that represented old *Polydora* infestation (no worms were seen). All animal showed good development of the gonadal tissues (approximately stage 7).

Histological Summary:

13/24 animals were females in stage 7 (ripe). 3/24 were females in stage 6 (ripening). 6/24 animals were males in stage 7 and 3/24 animals were males in late stage 6. Digestive gland cells were tall columnar. In three animals, mild to moderate multifocal congestion/telangectasis of the gill sinuses were noted. A possible Trichodinal parasite was noted on the gills of one animal. No lesions were associated with this organisms. The few areas of gill congestion/telangectasis could have resulted from mild trauma during transport or from euthanasia. Trichodinal parasites are common on sea scallop gills and are general considered insignificant.

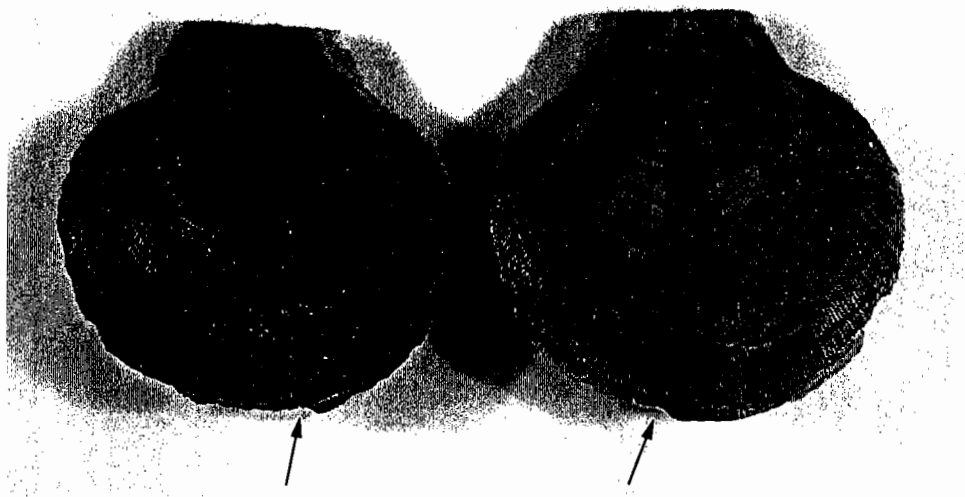
Conclusions:

In general, groups of scallops from all samples were healthy. Findings of Cliona, Rickettsial-like and Trichodinal infections and infestations were well within normal limits for sea scallops. The inward stepped growth of the new shell in sample 4 may have been cause by mild detachment of the mantle edges during capture one year before. Alternately/or concurrently the settlement of barnacle on the old shell may have encouraged the inward new shell position shift. In general, capture by dragging and minor shell chipping did not seem to affect the health of the population as a whole, especially if minimal time occurred between capture and redeployment. These animals were reproductively active and it is probable that numerous larvae were produced by these animals in their culture site.

FIGURE LEGEND

Figure 1. A. Mild chipping of the shell edges probably resulted from trauma due to capture by dragging (arrows). B. An inward displacement of the new shell growth resulted in a stepped appearance to the shell (1). Barnacles are noted on the old shell and at the step of the old and new shell (2). C. *Cliona* sp. burrows are obvious on the inner surface of the shells (arrows).

Figure 2. A. Striated muscle fragmentation is abundant in this adductor muscle (arrow). B. Foci of hemocytic inflammation/telangectasis are present in the lamellae of this gill (arrows). C. Inflammation composed of hemocytes is present in the smooth muscle crescent of the adductor muscle in this animal (arrow).



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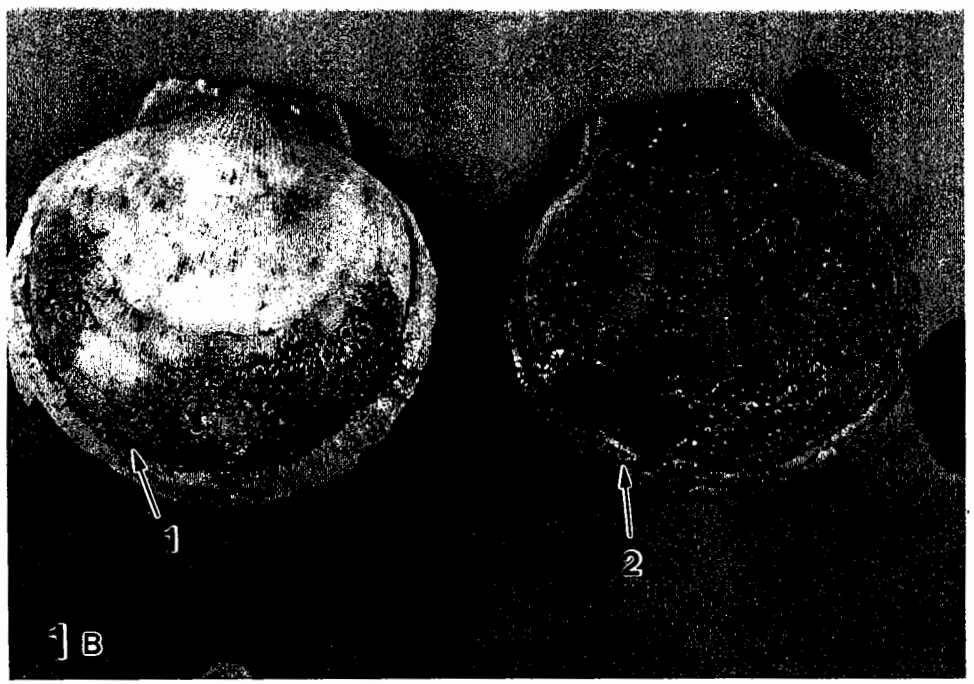

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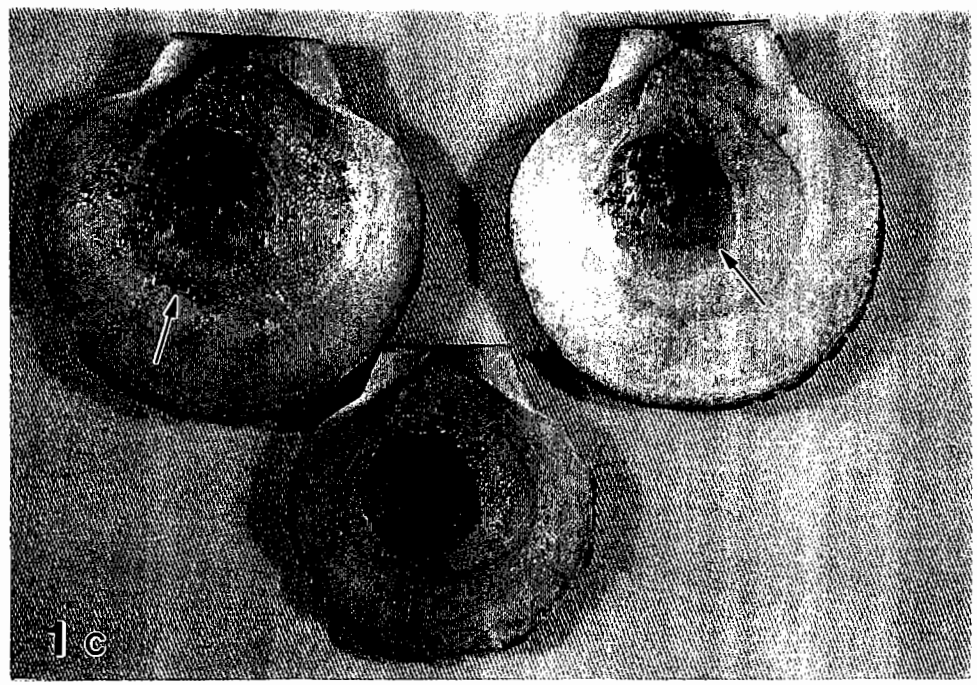

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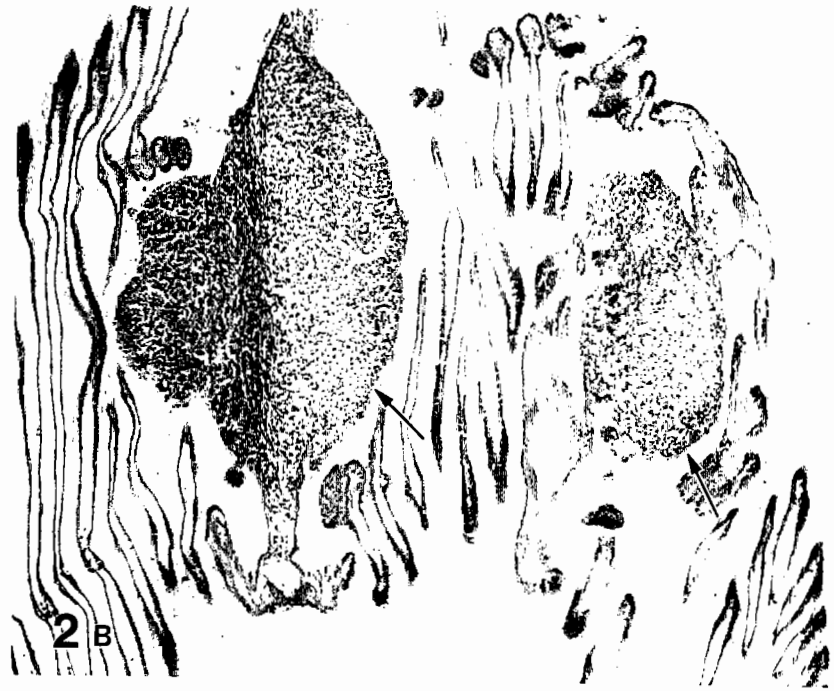
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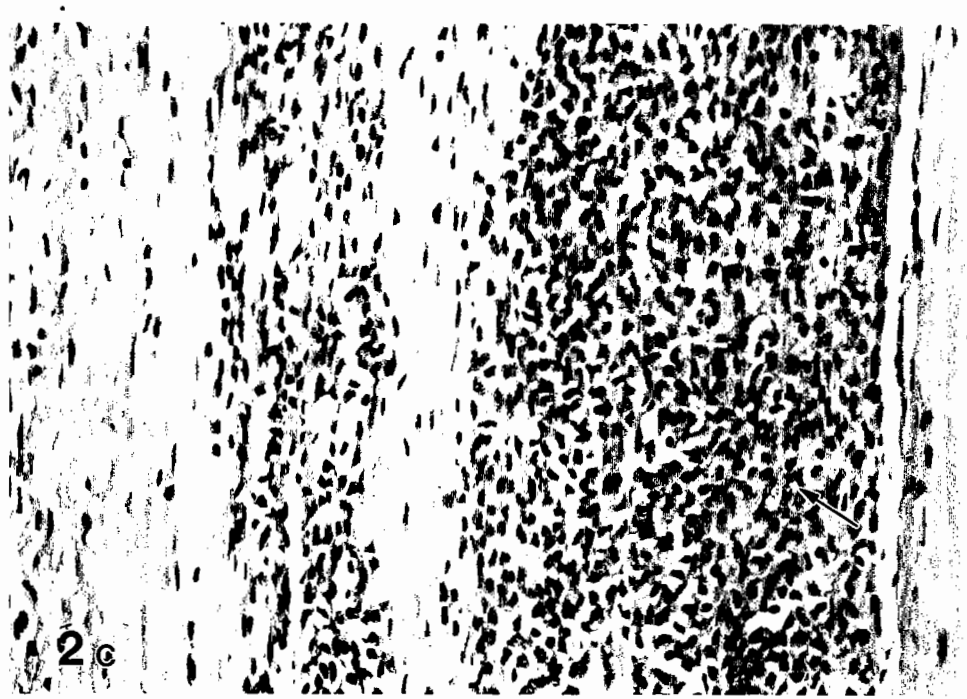
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APPENDIX E

Correspondence

SeaStead Project

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Northeast Region
Federal Building - 14 Elm Street
Gloucester, Massachusetts 01930-3799

January 20, 1987

MEMORANDUM FOR: Owners & Skippers of
F/V HARVESTER

FROM: Richard H. Schaefer
Acting Regional Director

SUBJECT: Provisional Exemption from CFR Part 650.20;
"Meat Count and Shell Height Standards"

Please be advised that only for the purpose of conducting gear selectivity research on sea scallops during the period of January 21 - February 15, 1987, inclusive, the above named vessel will be exempt from the subject sea scallop size limits.

A copy of this notice should be carried onboard the vessel when operating pursuant to this exemption.

cc: F/NER6 - McCarthy
F/NER7 - Kilbride
Coast Guard

New England Fishery Management Council
5 Broadway • Saugus, Massachusetts 01906-1097
TEL (617) 231-0422 • FTS 565-8457
FAX (617) 565-8937 • FTS 565-8937

Chairman
Joseph M. Brancaleone

Executive Director
Douglas G. Marshall

4.

MEMORANDUM

DATE: February 12, 1996

TO: Sea Scallop PDT

FROM: Lou Goodreau L.G

FILE COPY

SUBJECT: March 20, 1996 meeting

There will be a Scallop PDT meeting on March 20, 1996 from 9 AM until 4:30 PM at the Council office in Saugus, MA. We will discuss the proposal for experimental fisheries on Georges Bank and any other business that may come before the meeting. An agenda follows:

Agenda

Wednesday, March 20

9:00 am	Use of Experimental Fisheries on Georges Bank
12:00 pm	lunch
1:00	Use of Experimental Fisheries on Georges Bank (continued)
4:00	Other business - review of consolidation amendment
4:30	Adjourn

cc: Council Members
Scallop Advisors & Interested Parties

Attachment

COONAMESSETT FARM
277 Hatchville Road
East Falmouth, MA 02536
508-564-5516
FAX 508-564-5073
cfarm@capecod.net

February 26, 1996

Mr. Douglas Marshall
Executive Director
New England Fisheries Management Council
Suntaug Office Park
Saugus, MA 01906

Dear Doug,

There are two sea scallop projects that have been funded by the S-K program that I am working on that might require experimental fishery permits. I believe it would be appropriate to have these two projects discussed at the next Scallop PDT meeting in March so that a recommendation could be made to the Regional Director.

The first project, funded by a grant awarded to SER Enterprises of New Bedford, is to develop a finfish escape device for scallop drags. Cliff Goudey and I are in close contact with the Canadian DFO and Canadian scallop industry as they have been working on the same issue with limited success. We feel it would be appropriate to conduct the experimental tests in areas that the Council may want to use a finfish excluder as a management tool. This includes areas that are currently closed to scalloping for the purposes of groundfish protection. We would thus need an exemption from the closed area restrictions. It would be best to have the PDT and Council endorse this request before we go to the Regional Director.

The second project, the Westport scallop aquaculture project, will be examining the concept of harvesting and transporting seed scallops. There are indications that scallop production from wild stocks can be significantly enhanced by spreading out dense concentrations of scallop seed. This act apparently reduces mortality due to predation and disease while increasing growth rates. We would like to conduct an experiment in a seed bed, possibly in a closed area with non-regulation gear, to examine this issue. We would like to discuss the experiment with the PDT and seek their guidance on how to maximize the benefits from the experiment and get their endorsement.

I would appreciate the opportunity to present these two items at the next scallop PDT meeting. Thank you.

Sincerely,

Ronald Smolowitz

cc:A. Rosenberg

WESTPORT SCALLOPING CORPORATION
113 MacArthur Drive
New Bedford, MA 02740
(508) 996-0525 * FAX 991-3227

April 8, 1996

Dr. Andrew Rosenberg
NMFS Regional Director
National Marine Fisheries Service
One Blackburn Drive
Gloucester, MA 01930

Re: S-K Grant NA66FD0027 Sea Scallop Enhancement and Sustainable Harvesting Project Experimental Fishery Request.

Dear Dr. Rosenberg,

Due to the long process of trying to get site approval for the above referenced project, to which you are intimately familiar, we have had to re-think our initial seeding strategy. As stated in Sea Scallop Amendment #6, we would like to conduct ten days of dedicated scallop seed harvesting soon after final site approval. This harvest would be conducted with specially designed gear for the specific purpose of harvesting scallops from 35 to 65 mm in shell height.

In the last two years, since we had written the original S-K proposal, there have been major advances in Canada, New Zealand, and other countries in scallop bottom seeding operations. In New Zealand they actually have a new class of fishing vessel designed specifically for the purpose of transporting scallop seed. (Wouldn't this be an interesting use for vessels eliminated by consolidation?) In Canada research and proprietary operations are underway that transport sea scallop seed in the millions. What was experimental two years ago is now in the commercial phase in a number of countries. In order to move ahead, utilizing the knowledge gained overseas, we request the following experimental fishery be considered for the F/V Westport or a second vessel.

1. Three potential seed beds will be identified by Westport's technical consultant Ronald Smolowitz and NMFS NEFSC scientists from the 1995 sea scallop survey and approved for experimental harvest. If one or more of the seed beds lie within a closed area, approval to fish that bed be authorized. The major advantage of a bed in a closed area is

that more long-term monitoring of harvesting impact can be conducted.

2. Ten days of directed fishing on the seed bed will be conducted with modified scallop gear, possibly lined dredges, and all scallops harvested regardless of size would be transported and seeded into the experimental area. There would be no commercial harvesting or landing activities conducted during the seed trip.

3. All bycatch of fish and other species will not be retained for sale.

4. The project's technical consultant, Ronald Smolowitz, must be aboard the vessel during the seed collecting trip.

5. Complete catch logs would be maintained and submitted upon completion of the trip.

6. Days at sea involved in the seed collection would not count as days at sea under the scallop harvesting criteria.

The concept outlined above has been presented to the sea scallop PDT during their March meeting and discussion of experimental scallop fisheries. We believe this experimental request falls within the criteria the PDT discussed on a preliminary basis. Time is of the essence as we would like to have the seed collection conducted as soon as Amendment #6 gets the final approval which may be June 1, 1996. If there are any questions or other actions that need to be undertaken please contact Ronald Smolowitz (508-564-5516). Thank you.

Sincerely,

Soren Hendriksen

New class of vessel built to move NZ scallop seed

WORKING for the restructured and now flourishing scallop fishery on New Zealand's South Island is a new class of commercial vessel.

The 26 metre long *Tasman Challenger* which is known as a fisheries enhancement vessel (FEV), was designed by Richard McBride in Nelson and built by Helps Marine of Lyttleton. It will be used mainly for transporting live scallop spat.

Owned by the quota holders who make up the Challenger Scallop Enhancement Company, the all-steel vessel has a seven metre beam and draught of 1.5m.

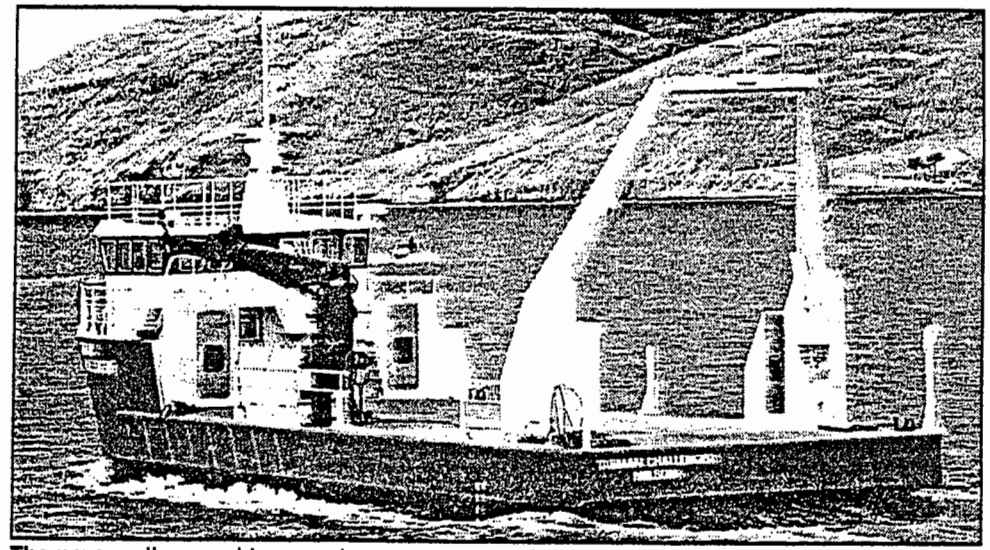
Twin Scania DS9 main engines power the *Tasman Challenger*, both capable of developing 245hp. Each turns a Nalder and Biddle four-blade propeller. Gearboxes are of the Twin Disc MG5091 type, and the auxiliary engine is a B series six-cylinder Cummins diesel.

The vessel has a service speed of nine knots, with top speed of 10.5 knots. Twin screws and a counter-rotating bow thruster give her the manoeuvrability needed to move around the spat lines.

The large open working deck allows a payload capacity of around 100 metric tons, and includes a lifting frame which houses the engine room and tiller flat access hatches fitted close to the stern.

An Alaska crane is fitted in the forward end on the port side.

The wheelhouse is above the forecastle deck, giving the skipper good all round vision.



The new scallop seed transporter.

'Clean green' system for growing abalone

OVER the past five years and "after many experimental prototypes" Soren Fuglsang in Tasmania says he has developed and refined a system for growing abalone and other algae consuming species which require hand feeding, no antibiotics or chemicals, and turns out a high-

Upon receipt of the aforementioned information, we will resume our review of your request for a revision in the Statement of Work and for an experimental fishing permit. If you have any questions, please contact me or Rick Pearson, the Program Officer for this project, at (508) 281-9265

Sincerely,

Harold C. Mears, Chief
State, Federal and Constituent
Programs Division

cc: F/NEO1-Pat Kurkul
cc: F/NEO1-Kathi Rodrigues
cc: F/NEO1-Paul Jones
cc: F/NEO1-Peter Christopher
cc: James Widman/Milford

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930

June 3, 1996 F/NE04:RAP

Westport Scalloping Corporation
C/O Mr. Soren Henriksen
113 MacArthur Drive
New Bedford, Massachusetts 02740

Dear Mr. Henriksen:

This is in response to your correspondence dated April 8, 1996 to Dr. Rosenberg for an experimental fishing permit in conjunction with Saltonstall-Kennedy grant NA66FD0027. It is the intention of the Regional Office to review the request as expeditiously as possible. However, before a permit may be issued, some additional information is required. The changes which you propose constitute a revision in the scope of work being conducted under an S/K grant, and accordingly, require approval from the NOAA grants and program offices. Therefore, you should submit the proposed revision to the Program Officer for initial review and approval. In conjunction with the submission of a proposed revision, you may submit another, more specific, request for an experimental fishing permit to the Regional Director.

The proposed revision to the Statement of Work should address any changes and associated modifications to the project budget under item f (5), "Scallop Harvest, Transportation, and Seeding". A justification is needed which explains how the switch to a directed effort on juvenile scallops, as opposed to using bycatch as described in the original proposal, will provide beneficial information to potential sea scallop aquaculturists. With regard to the request for an experimental fishing permit, the following information is necessary: 1) justification of the need for an experimental permit, 2) precise coordinates, preferably on a small chart, of sea scallop seed beds proposed for harvesting, 3) description of the proposed gear including ring size or mesh size, 4) dates of the proposed harvesting activities, 5) owner name, vessel name, permit number, and documentation number of any participating boats.

Approval of your request for a project revision and an experimental fishing permit will be based upon the information which you provide. Preliminary review of your initial request dated April 8, 1996 indicates that there is serious concern with fishing in a closed area. These areas are closed to all fishing and adverse impacts could arise if we allow vessels to dredge these areas with a small mesh liner. Furthermore, moving seed scallops from one closed area to another will not produce the benefits needed to justify the activity. Please keep this in mind if you submit another request.

WESTPORT SCALLOPING CORPORATION
113 MacArthur Drive
New Bedford, MA 02740
(508) 996-0525 * FAX 991-3227

July 22, 1996

Mr. Harold Mears, Chief
State, Federal and Constituent Program
National Marine Fisheries Service
One Blackburn Drive
Gloucester, MA 01930

Re: S-K Grant NA66FD0027 Sea Scallop Enhancement and Sustainable Harvesting Project Experimental Fishery Request.

Dear Mr. Mears,

Thank you for reviewing Westport Scallop Corporation's request for an experimental fishing permit that would enable us to conduct our S/K funded research. As you indicated in your letter there are some changes to the project work plan and budget that can be viewed as a revision in the scope of work. I will now identify these changes for your approval by item number in section f. Project Statement of Work:

1. The proposed test site, as a result of the public hearing process, has shifted about five miles to the west. This shift should not alter the scope of work in any way.

2. The success around the world with sub-surface arrays for aquaculture has lead us to redesign our array concept. We are now contemplating using the ten large buoyed grow-out cages arrayed as single units (see attached sketch). This should significantly lower the cost of the equipment needed to construct the arrays.

3. An experimental fishery permit has been requested for the F/V Westport and the F/V Concordia as planned. However, there may be difficulties using the additional vessels related to the current scallop FMP and accounting of sea days. We expect to work on this issue after the initial seeding and the project is underway at sea.

4. There are changes to our seeding strategy, but these to not alter the scope of work. We will be seeding the area based on the results of our side scan sonar survey and biological survey. The array will be situated in a portion of the test area that least interferes with the commercial fishermen using the area. We may only need three corner buoys as there is an existing USCG buoy that can be used to mark the Northwest corner of the site.

5. In our original plan two means of gathering seed were identified; commercial bycatch and direct harvesting with modified gear. We planned to primarily use bycatch but the delays in getting approval, concerns with sea day accounting, and the switch to a larger commercial ring size have forced us to reconsider. We now plan to initially stock the area by direct seed harvesting. This concept has been approved by the New England Council. We hope to shift into using bycatch as the project progresses if the management issues can be resolved.

6. There are no planned changes to the monitoring plan.

7. At this time we do not know how we are going to proceed with the site harvesting.

Sections eight through eleven remain essentially unchanged.

The major change in scope of the project, as shown above, is the directed effort on juvenile scallops for the purposes of seeding a grow-out area. Recent studies have indicated that this may in fact be a good resource enhancement strategy. It is very important to emphasize that the interaction of fishing gear with the ecosystem is complex. Research has demonstrated that the act of towing scallop dredges directly and indirectly causes mortality on uncaught scallops, mostly the young. At first glance it would seem appropriate to close areas to scallop dredging that have high amounts of small scallops present to reduce bycatch and other incidental mortality. However, other research has shown that dense concentrations of young scallops attract predators and thus suffer high levels of predation and also possibly high levels of disease related mortality. Crabs are especially efficient at consuming large quantities of juvenile scallops when they are closely packed. Less dense concentrations seem to have higher survival rates.

Fishermen have noticed that areas closed to scalloping are not as productive as areas that are fished. One hypothesis is that the act of fishing redistributes and disburses scallop concentrations with the end result being higher production levels. Another possibility is that dredging removes predators as

bycatch, kills the predators, or otherwise interferes with their feeding. Whatever the mechanism, the possibility exists that the mortality to scallop pre-recruits to the fishery associated with fishing is less than that which would have occurred naturally without fishing activities present. We hope to gain some insight into this issue during our project.

We request to shift up to $10,000 from the Equipment Category (savings from redesigning the array and one less picket buoy) in order to hire a sea going technician to assist in data recording and analysis. The money will go to the Consultants Category. The technician will be hired by Ronald Smolowitz (D/B/A Coonamessett Farm) using Coonamessettt Farm's competitive hiring practices. The total cost of the technician (salary, insurance and fringes will be $20 per hour for a total of 500 hours).

Finally, we request that the project's completion date be extended a full year. The Council/NMFS site approval process has taken nearly two years and has still not been completed. In effect, the process has been a part of this project. Now we can be reasonably certain that the site will not change even if for some unforeseen reason we do not get the Project's FMP Amendment approved. All we need to commence seeding is the experimental fishing permit. Hopefully we can get this and seed the site this fall. A one year extension will provide the opportunity to monitor the seeded scallops through four seasons.

If there are any further questions please contact Ronald Smolowitz or myself. Thank you for your support.

Sincerely,

Soren Hendriksen

WESTPORT SCALLOPING CORPORATION
113 MacArthur Drive
New Bedford, MA 02740
(508) 996-0525 * FAX 991-3227

July 22, 1996

Dr. Andrew Rosenberg
NMFS Regional Director
National Marine Fisheries Service
One Blackburn Drive
Gloucester, MA 01930

Re: S-K Grant NA66FD0027 Sea Scallop Enhancement and Sustainable Harvesting Project Experimental Fishery Request.

Dear Dr. Rosenberg,

Due to the long process of trying to get site approval for the above referenced project, to which you are intimately familiar, we have had to re-think our initial seeding strategy. As stated in Sea Scallop Amendment #6, we would like to conduct ten days of dedicated scallop seed harvesting soon after final site approval. This harvest would be conducted with specially designed gear for the specific purpose of harvesting scallops from 35 to 65 mm in shell height.

In the last two years, since we had written the original S-K proposal, there have been major advances in Canada, New Zealand, and other countries in scallop bottom seeding operations. In New Zealand they actually have a new class of fishing vessel designed specifically for the purpose of transporting scallop seed. (Wouldn't this be an interesting use for vessels eliminated by consolidation?) In Canada research and proprietary operations are underway that transport sea scallop seed in the millions. What was experimental two years ago is now in the commercial phase in a number of countries.

In a letter to you dated April 8, 1996 I requested an experimental fishery permit to catch and transport sea scallop seed for the purposes of our S/K funded research project. I received a letter from Mr. Harold Mears dated June 3, 1996 requesting some additional information. Attached you will find a copy of my response to Mr. Mears' request. As instructed, in conjunction with the proposed revisions, I am submitting this more specific request for an experimental fishery permit.

In order to move ahead, utilizing the knowledge gained overseas, we request the following experimental fishery be considered for the F/V Westport(Permit # 410249, Doc. # 619338)owned by Westport Scalloping Corporation and the F/V Concordia (Permit # 410009, Doc. # 250168)owned by Malvin Kvilhaug. The experimental permit is needed in order for the vessels to fish lined dredges for sea scallops outside of the days-at-sea program of the Sea Scallop FMP.

1. The area to be fished is located in the South Channel to the west of Georges Bank. The area can be defined as two ten minute squares; one centered at 41-35 lat, 69-35 long; and the other centered at 41-45 lat, 69-45 long. The bed of small scallops lies along the 37 fathom edge through these two squares.

2. Ten days of directed fishing on the seed bed will be conducted with conventional scallop dredges (two 15-foot dredges per vessel) lined with 38 mm mesh. All scallops harvested regardless of size will be transported and seeded into the experimental area. There will be no commercial harvesting or landing activities conducted during the seed trip.

   The plan is to have the F/V Westport conduct five days of harvesting and transport in late September (this is a function of final project site approval). About two weeks later the F/V Concordia will conduct similar operations making use of the experience gained from the F/V Westport. We hope to harvest 500,000 scallop seed during the ten days of fishing. In addition, monitoring of the first seeded scallops will be conducted. We request that the experimental fishery permit cover the period from September 15, 1996 until November 15, 1996.

3. All bycatch of fish and other species will not be retained for sale. We do not anticipate any impacts on endangered or protected species.

4. The project's technical consultant, Ronald Smolowitz, will be aboard the vessels during the seed collecting trips.

5. Complete catch logs would be maintained and submitted upon completion of the trips.

6. Days at sea involved in the seed collection would not count as days at sea under the scallop harvesting criteria.

The concept outlined above has been presented to the sea scallop PDT during their March meeting and discussion of experimental scallop fisheries. We believe this experimental request falls within the criteria the PDT discussed on a preliminary basis. Time is of the essence as we would like to have the seed collection conducted as soon as Amendment #6 gets the final approval which may be September 1, 1996. Even if the Amendment is not approved by that date we will need to commence seeding before winter and take our chances with towed gear impacting the site. If there are any questions or other actions that need to be undertaken please contact Ronald Smolowitz (508-564-5516). Thank you.

Sincerely,

Soren Hendriksen

cc: H. Mears

WESTPORT SCALLOPING CORPORATION
113 MacArthur Drive
New Bedford, MA 02740
(508) 996-0525 * FAX 991-3227

August 26, 1996

Dr. Andrew Rosenberg
NMFS Regional Director
National Marine Fisheries Service
One Blackburn Drive
Gloucester, MA 01930

Re: S-K Grant NA66FD0027 Sea Scallop Enhancement and Sustainable Harvesting Project Experimental Fishery Request.

Dear Dr. Rosenberg,

In conjunction with Westport Scalloping Corporation's request for an experimental Fishing Permit (dated July 22, 1996), I hereby request a letter authorizing the collection and retention of scientific specimens (sea scallops) for research activities in support of the project.

The authorization requested is the ability to retain and transfer scallops in the shell under the legal minimum landed size throughout the project period. The purpose is to study behavior, disease, growth, and mortality related to various holding and tagging strategies as outlined in our S/K project. The period covered by the authorization would be the same as for the S/K project, ending October 31, 1997. The quantity of scallops landed ashore by any one vessel at any one time would not exceed 300 individuals (approximately one bushel). The F/V Westport(Permit # 410249, Doc. # 619338) owned by Westport Scalloping Corporation and the F/V Concordia (Permit # 410009, Doc. # 250168)owned by Malvin Kvilhaug will be the collecting vesssels. These scallops would have to be transferred to either Ronald Smolowitz or Dale Leavitt and brought to Woods Hole.

Larger quantities of scallops would be transferred at sea between the harvesting vessels and vessels handling cages outside of the requested experimental fishery period. Where this is not covered by our specific experimental fishing request it may be appropriate to authorize the vessel to retain undersized scallops in the shell (bycatch) for scientific study only. It is not possible to predict when this may occur during the project period or what will be the quantity of scallops. A retention/transfer limit might be appropriately set at 20 bushels.

I have had several conversation with your staff on how to achieve the intent of this request over the last several weeks and have not received firm guidance. This request does not fall into the category of "Scientific Research Activity" as defined by NMFS because it does not involve the use of a scientific research vessel. It may be most expedient to add the conditions requested in this letter to our existing experimental (exempted) fishing request. I look forward to your prompt response.

Sincerely,

Ronald Smolowitz
Principal Investigator
Westport Scalloping

cc: H. Mears

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930-2298

SEP 11 1996

Ron Smolowitz
Coonamessett Farm
277 Hatchville Road
East Falmouth, MA 02536

Dear Mr. Smolowitz:

Thank you for your letter requesting acknowledgement of scientific research on fishing vessels operating in conjunction with a Saltonstall/Kennedy (S/K) grant awarded to Westport Scalloping Corporation. After evaluating your request, I have concluded that the activities described can not be considered "scientific research activity conducted on a scientific research vessel" because they do not meet the definition as specified in the Magnuson Act Provisions (50 CFR 600). Specifically, the vessels involved do not appear to be scientific research vessels, which must be, "vessels owned or chartered by, and controlled by, a foreign government agency, U.S. Government agency, U.S. state or territorial agency, university (or other educational institution accredited by a recognized national or international accreditation body), international treaty organization, or scientific institution." Operations described in your letter would more appropriately be considered experimental fishing or exempted fishing as specified in the Magnuson Act Provisions.

As you know, to be issued an experimental fishing permit, you would be required to submit an application that would be reviewed by NMFS, and submitted to the regional fishery management council, the fishery management agencies of the affected states, the United States Coast guard and the public for comment. I suggest that you either pursue this option or locate an alternative source of undersized scallops to support the S/K project and research needs.

I apologize if this will cause problems and delays with your project, however, NMFS must process your requests pursuant to the Magnuson Act Provisions. Please call Pete Christopher at (508) 281-9288 if you have any questions.

Sincerely,

Patricia A. Kurkul
Chief, Fishery Management
Operations Division

cc: Harold Mears
Deirdre Kimball

COONAMESSETT FARM
277 Hatchville Road
East Falmouth, Massachusetts, USA 02536
508-564-5516 FAX 508-564-5073
cfarm@capecod.net

September 25, 1996

Seastead Project
Tentative Meeting Agenda
Monday, September 30, 1996, 1 PM, Gloucester RO

Projects under discussion

S-K Grant NA66FD0027 Sea Scallop Enhancement and Sustainable Harvesting Project
S-K Grant NA66FD0026 Sea Scallop Dredge Finfish Excluder Project

Overall goal of these projects

Examine new concepts for sea scallop production in New England

Purpose of this meeting

To examine the current status of the Amendment and experimental requests.
To determine if we are all willing to actively work towards the same goal.
To determine the immediate obstacles in the way of achieving the goal.
To determine what the project participants need to do to move forward.
To determine what NMFS NER can do to facilitate the process.

Issues

Status of scallop amendment for Westport project.
Status of Westport Scalloping Experimental Fishery request (dated July 22, 1996).
Status of SER Enterprises Experimental Fishery request (dated August 8, 1996).
Concerns about retention and handling undersized shell stock.
Holding of scallops by lobstermen.

WESTPORT SCALLOPING CORPORATION
113 MacArthur Drive
New Bedford, MA 02740
(508) 996-0525 * FAX 991-3227

September 29, 1996

Dr. Andrew Rosenberg
NMFS Regional Director
National Marine Fisheries Service
One Blackburn Drive
Gloucester, MA 01930

Re: S-K Grant NA66FD0027 Sea Scallop Enhancement and Sustainable Harvesting Project Experimental Fishery Request.

Dear Dr. Rosenberg,

In conjunction with Westport Scalloping Corporation's request for an Experimental Fishing Permit (dated July 22, 1996), I hereby request an Experimental Fishing Permit for the collection and retention of scientific specimens (sea scallops) for research activities in support of the project.

The authorization requested is the ability to retain and transfer scallops in the shell under the legal minimum landed size throughout the project period. The purpose is to study behavior, disease, growth, and mortality related to various holding and tagging strategies as outlined in our S/K project. The period covered by the authorization would be the same as for the S/K project, ending October 31, 1997. The quantity of scallops landed ashore by any one vessel at any one time would not exceed 300 individuals (approximately one bushel). The F/V Westport(Permit # 410249, Doc. # 619338) owned by Westport Scalloping Corporation and the F/V Concordia (Permit # 410009, Doc. # 250168)owned by Malvin Kvilhaug will be the collecting vessels. In addition, the F/V Mattia-C (permit # 230108, Doc. # 250069) owned by Tom Phaneuf (PO Box 2443, Edgartown,MA; phone # 508-627-7152) will be conducting scientific and fishing operations within the experimental site during the project period. Scallops collected and landed ashore will be transferred to either Ronald Smolowitz or Dale Leavitt and brought to Woods Hole.

Larger quantities of scallops would be transferred at sea between the harvesting vessels and vessels handling cages. Where this is not covered by the Experimental Fishing Request dated July 22, 1996, it may be appropriate to authorize the vessel to retain undersized scallops in the shell (bycatch) for scientific

study only. It is not possible to predict when this may occur during the project period or what will be the quantity of scallops. A retention/transfer limit might be appropriately set at 20 bushels.

We do not require any special dispensation from regulated species regulations nor do we expect any interactions with marine mammals or protected species.

I have had several conversation with your staff on how to achieve the intent of this request over the last several months and have not received firm guidance. This request does not fall into the category of "Scientific Research Activity" as defined by NMFS because it does not involve the use of a scientific research vessel. It may be most expedient to add the conditions requested in this letter to our existing experimental (exempted) fishing request. I look forward to your prompt response.

Sincerely,

Ronald Smolowitz
Principal Investigator
Westport Scalloping

cc: H. Mears

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930-2298

JAN - 8 1997

EXPERIMENTAL FISHING PERMIT

ISSUED TO MICHIGAN FISHING INC FOR F/V CONCORDIA
DOCUMENTATION #250169 FEDERAL PERMIT # 410009

Vessel Owner: Malvin Kvilhaug
Michigan Fishing Inc
2 Middle St
Fairhaven, MA 02719-2910

Project Coordinator: Ronald Smolowitz
277 Hatchville Road
East Falmouth, MA 02536

This permit is issued in accordance with the Magnuson-Stevens Act Provisions, 50 CFR Part 600, §600.745, and the Fisheries of the Northeastern United States regulations, 50 CFR Part 648, §648.12.

The Westport Scalloping Corporation has received a Saltonstall/Kennedy (S/K) Grant for the project entitled "Sea Scallop Enhancement and Sustainable Harvesting." The project is designed to test the feasibility of operating an offshore growout facility where Atlantic sea scallops (scallops) can be harvested efficiently upon reaching a marketable size. The Westport Scalloping Corporation will examine the effects of various holding and tagging strategies on juvenile scallops to be used to compliment holding and tagging practices in the offshore growout facility. This vessel may catch, retain, transport, transfer and offload scallops with a shell height less than 3 ½ inches in accordance with and subject to the following conditions and requirements:

1. This certificate must be carried on board this vessel during the period specified below.

2. This certificate must be accompanied by a valid Federal Atlantic sea scallop permit.

3. Scallops with a shell height less than 3 ½ inches may not be sold, and must be offloaded for transport to Ronald Smolowitz, a principle investigator for the project, or Dale Leavitt of the Woods Hole Oceanographic Institute in Woods Hole, Massachusetts.

4. This vessel's activity must be in compliance with all other current Federal fisheries regulations, including, but not limited to gear restrictions, days-at-sea and bycatch possession limits.

5. Failure to comply with all of the above provisions, or the provisions of the Magnuson Act, automatically voids this authorization as of the date of the violation and subjects the violator to fines and/or penalties.

PARTICIPATION PERIOD:

January 10, 1997 - October 31, 1997

AUTHORIZED BY:

I agree to comply with the conditions of this certificate.

Signature of Vessel Owner

This authorization is not valid unless signed by Malvin Kvilhaug .

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930-2298

JAN - 8 1997

EXPERIMENTAL FISHING PERMIT

ISSUED TO WESTPORT SCALLOPING CORPORATION FOR F/V WESTPORT
DOCUMENTATION #619338, FEDERAL PERMIT # 410249

Vessel Owner: Soren Hendriksen
Westoport Scalloping Corporation
113 MacArthur Dr
New Bedford, MA 02740

Project Coordinator: Ronald Smolowitz
277 Hatchville Road
East Falmouth, MA 02536

This permit is issued in accordance with the Magnuson-Stevens Act Provisions, 50 CFR Part 600, §600.745, and the Fisheries of the Northeastern United States regulations, 50 CFR Part 648, §648.12.

The Westport Scalloping Corporation has received a Saltonstall/Kennedy (S/K) Grant for the project entitled "Sea Scallop Enhancement and Sustainable Harvesting." The project is designed to test the feasibility of operating an offshore growout facility where Atlantic sea scallops (scallops) can be harvested efficiently upon reaching a marketable size. The Westport Scalloping Corporation will examine the effects of various holding and tagging strategies on juvenile scallops to be used to compliment holding and tagging practices in the offshore growout facility. This vessel may catch, retain, transport, transfer and offload scallops with a shell height less than 3 ½ inches in accordance with and subject to the following conditions and requirements:

1. This certificate must be carried on board this vessel during the period specified below.

2. This certificate must be accompanied by a valid Federal Atlantic sea scallop permit.

3. Scallops with a shell height less than 3 ½ inches may not be sold, and must be offloaded for transport to Ronald Smolowitz, a principle investigator for the project, or Dale Leavitt of the Woods Hole Oceanographic Institute in Woods Hole, Massachusetts.

4. This vessel's activity must be in compliance with all other current Federal fisheries regulations, including, but not limited to gear restrictions, days-at-sea and bycatch possession limits.

5. Failure to comply with all of the above provisions, or the provisions of the Magnuson Act, automatically voids this authorization as of the date of the violation and subjects the violator to fines and/or penalties.

PARTICIPATION PERIOD:

January 10, 1997 - October 31, 1997

AUTHORIZED BY:

I agree to comply with the conditions of this certificate.

Signature of Vessel Owner

This authorization is not valid unless signed by Soren Hendriksen.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930-2298

JAN - 8 1997

EXPERIMENTAL FISHING PERMIT

ISSUED TO THOMAS P. PHANUEF FOR F/V MATTIA-C
DOCUMENTATION #250069, FEDERAL PERMIT # 230108

Vessel Owner: Thomas P. Phanuef
P.O Box 2443 Watcha Path
Edgartown, MA 02539

Project Coordinator: Ronald Smolowitz
277 Hatchville Road
East Falmouth, MA 02536

This permit is issued in accordance with the Magnuson-Stevens Act Provisions, 50 CFR Part 600, §600.745, and the Fisheries of the Northeastern United States regulations, 50 CFR Part 648, §648.12.

The Westport Scalloping Corporation has received a Saltonstall/Kennedy (S/K) Grant for the project entitled "Sea Scallop Enhancement and Sustainable Harvesting." The project is designed to test the feasibility of operating an offshore growout facility where Atlantic sea scallops (scallops) can be harvested efficiently upon reaching a marketable size. The Westport Scalloping Corporation will examine the effects of various holding and tagging strategies on juvenile scallops to be used to compliment holding and tagging practices in the offshore growout facility. This vessel may catch, retain, transport, transfer and offload scallops with a shell height less than 3 ½ inches in accordance with and subject to the following conditions and requirements:

1. This certificate must be carried on board this vessel during the period specified below.

2. This certificate must be accompanied by a valid Federal Atlantic sea scallop permit.

3. Scallops with a shell height less than 3 ½ inches may not be sold, and must be offloaded for transport to Ronald Smolowitz, a principle investigator for the project, or Dale Leavitt of the Woods Hole Oceanographic Institute in Woods Hole, Massachusetts.

4. This vessel's activity must be in compliance with all other current Federal fisheries regulations, including, but not limited to gear restrictions, days-at-sea and bycatch possession limits.

5. Failure to comply with all of the above provisions, or the provisions of the Magnuson Act, automatically voids this authorization as of the date of the violation and subjects the violator to fines and/or penalties.

PARTICIPATION PERIOD:

January 10, 1997 - October 31, 1997

AUTHORIZED BY:

I agree to comply with the conditions of this certificate.

Signature of Vessel Owner

This authorization is not valid unless signed by Thomas P. Phanuef.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930-2298

JAN 27 1997

Dear Permit Holder:

Amendment 5 to the Atlantic Sea Scallop Management Plan has been approved. This amendment authorizes an 18 month closure period to allow scientists and technical experts, in cooperation with fishers, to conduct an experiment and demonstration project involving sea scallop research, enhancement and aquaculture. The action closes a nine square mile site (see attached chart) to mobile fishing gear and partially closes the site to non-mobile gear, and temporarily exempts vessels participating in the experiment from certain fishing regulations. The new area will be closed between February 13, 1997 through July 15, 1998. The area is:

Sea Scallop Experimental Fishing Area

Point	Latitude	Longitude
1	41°11.8' N.	70°50' W.
2	41°11.8' N.	70°46' W.
3	41°08.8' N.	70°46' W.
4	41°08.8' N.	70°50' W.

The amendment does not allow fishing activities within the Scallop Experimental Fishing Area, except handgear fishing. Fishing with lobster pot and longline gear is also permitted provided you apply for and obtain an allowed gear permit (AGP), issued by the Regional Administrator.

If your vessel will be participating in project activities within or outside of the area, you will need to apply for an experimental fishing permit (EFP) from the Regional Administrator. You may use the attached form to apply for an AGP or EFP. Applications must be received at least 30 days before the desired effective date of the AGP or EFP. Vessels receiving AGPs may be required to move their gear within, or remove their gear from, the area upon notification by the Regional

Administrator. All vessels receiving AGPs or EFPs must comply with any additional restrictions specified in the permit.

For more information, please call (508)281-9273.

Sincerely,

Dr. Andrew A. Rosenberg
Regional Administrator

SEA SCALLOP FISHING AREA
ALLOWED GEAR/EXPERIMENTAL FISHING
PERMIT APPLICATION

Date of Application (30 days prior to start of fishing trip) _____

Type of Permit (Check One):

Allowed Gear Permit _____ Experimental Gear Permit _____

Applicant's Name _____

Applicant's Address _____

_____

Applicant's Telephone _____

Applicant's FAX Number _____

Vessel Name _____

Owner's Name _____

Owner's Address _____

_____

Owner's Telephone _____

NMFS Permit Number _____

Coast Guard Documentation Number _____

Species Expected to Harvest:

Target _____

Incidental _____

Fill-in All That Apply:

Gear Type _____ Size _____ Buoy Colors _____

Trap Identification Markings _____

Amount of Gear That Will Be Used _____

Exact Time(s) Fishing Will Take Place in the Scallop Experimental Fishing Area

_____

_____

_____

_____

_____

_____

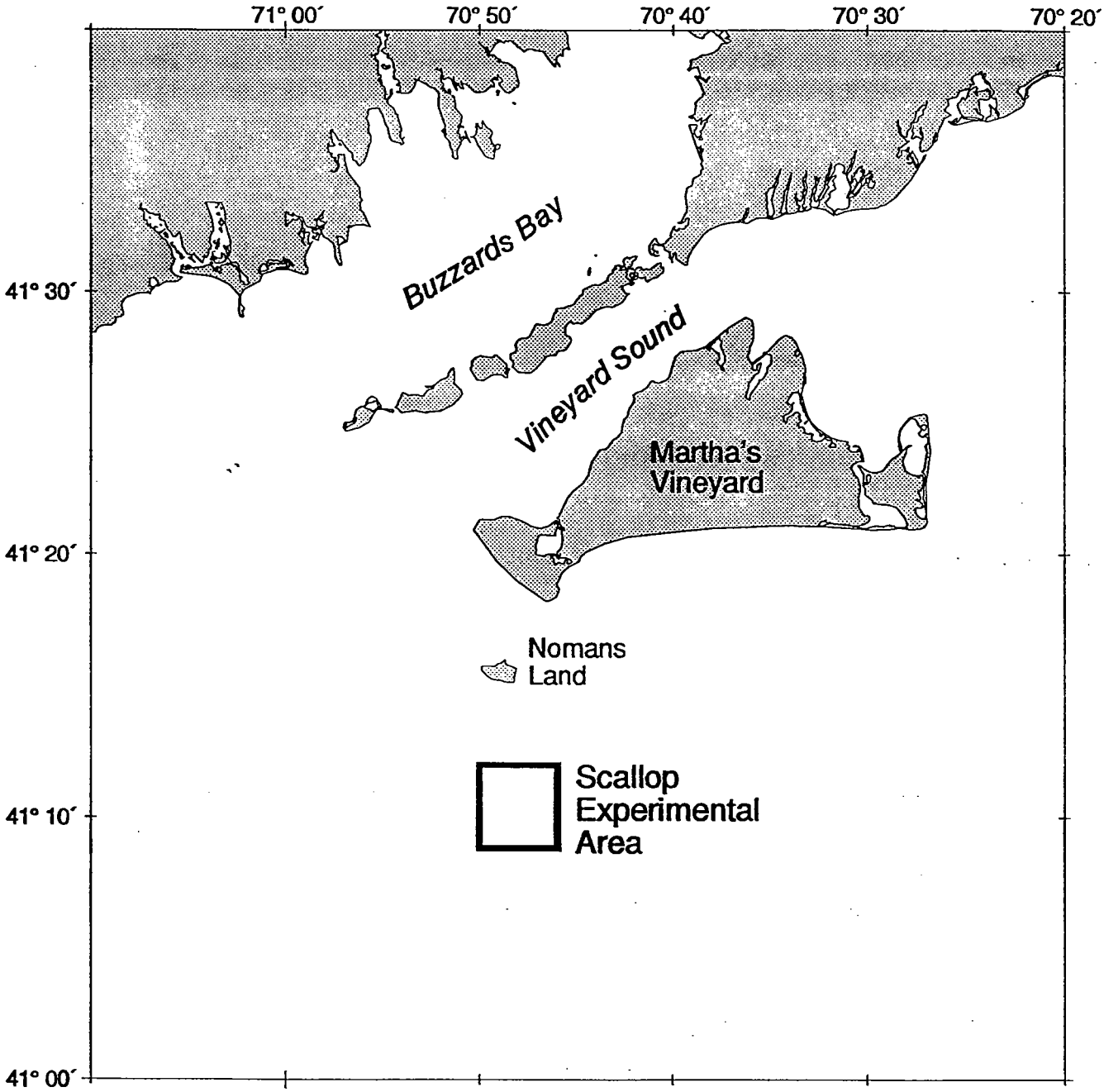
_____

Permit Holder's Name (printed)

_____

Permit Holder's Signature

Return this form 30 days prior to fishing trip to: NMFS, Attn.: Scallop Experimental Area Permit, 1 Blackburn Drive, Gloucester, MA 01930


71° 00´
70° 50´
70° 40´
70° 30´
70° 20´
41° 30´
41° 20´
41° 10´
41° 00´
Buzzards Bay
Vineyard Sound
Martha's Vineyard
Nomans Land
Scallop Experimental Area

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930

SEA SCALLOP
EXPERIMENTAL FISHING PERMIT

ISSUED TO: F/V WESTPORT
DOCUMENTATION NUMBER: 619338
FEDERAL PERMIT NUMBER: 410249

This permit is issued in accordance with the Magnuson-Stevens Act Provisions, 50 CFR Part 600, §600.745, and Fisheries of the Northeastern United States regulations, 50 CFR Part 648, §648.12, and grants your request for an exemption from the transfer at sea restriction specified under 50 CFR 648, §648.13(c), and the minimum ring size restriction specified under 50 CFR part 648, §648.51(b)(3) while engaging exclusively in project activity as specified under 50 CFR Part 648, §648.56(a)(4)(ii) for the purpose of fishing within and outside the Scallop Experimental Fishing Area (SEFA) specified under 50 CFR Part 648, §648.56(a)(1). Please note, however, that vessels participating in the experiment continue to be subject to the DAS requirements specified under 50 CFR part 648, §648.10, §648.53 and all other requirements in §648.

In addition, this experimental fishing permit is granted subject to the following conditions:

1. This permit must be carried on board the vessel.

2. At least one week prior to sailing, vessels engaged exclusively in the project activity using non-regulated gear outside the SEFA, bottom surveying, or biological sampling, must notify NMFS at 508-281-9273 of the documentation and permit number of the authorized vessel and the approximate date of departure the vessel will be engaged exclusively in the project activity within the SEFA or using non-regulated gear outside the SEFA.

3. At least 24 hours prior to the vessel's departure from and return to port, vessels engaged exclusively in the project activity using non-regulated gear outside the SEFA, bottom surveying, or biological sampling, must notify NMFS enforcement at 508-992-7711 that the vessel will be engaged exclusively in the project activity within the SEFA, using non-regulated gear outside the SEFA, bottom surveying, or biological sampling. Prior to the vessel's return, NMFS enforcement must be informed of the port and approximate time of landing.

4. For vessels engaged exclusively in the project activity using non-regulated gear outside the SEFA, bottom surveying, or biological sampling, the DAS exemption is limited to a total of ten (10) DAS, beginning when the vessel notifies NMFS enforcement as required in (3) above.

5. This vessel must be issued, and must carry on board, a valid Federal sea scallop permit.

6. The experimental fishing program and this permit authorizing experimental fishing activity in conjunction with the project may be terminated by the Regional Administrator at any time at his discretion.

7. Failure to comply with all of the above provisions, or the provisions of the Magnuson-Stevens Act, automatically and immediately voids this authorization and subjects the violator to fines and/or permit sanctions.

Participation Period

February 13, 1997 - July 15, 1998

Authorized by

Andrew A. Rosenberg, Ph.D.
Regional Administrator

I agree to comply with the conditions of this permit.

Signature of Vessel Owner
This authorization is not valid unless signed by Vessel Owner

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930-2298

JAN - 8 1997

EXPERIMENTAL FISHING PERMIT

ISSUED TO THOMAS P. PHANUEF FOR F/V MATTIA-C
DOCUMENTATION #250069, FEDERAL PERMIT # 230108

Vessel Owner: Thomas P. Phanuef
P.O Box 2443 Watcha Path
Edgartown, MA 02539

Project Coordinator: Ronald Smolowitz
277 Hatchville Road
East Falmouth, MA 02536

This permit is issued in accordance with the Magnuson-Stevens Act Provisions, 50 CFR Part 600, §600.745, and the Fisheries of the Northeastern United States regulations, 50 CFR Part 648, §648.12.

The Westport Scalloping Corporation has received a Saltonstall/Kennedy (S/K) Grant for the project entitled "Sea Scallop Enhancement and Sustainable Harvesting." The project is designed to test the feasibility of operating an offshore growout facility where Atlantic sea scallops (scallops) can be harvested efficiently upon reaching a marketable size. The Westport Scalloping Corporation will examine the effects of various holding and tagging strategies on juvenile scallops to be used to compliment holding and tagging practices in the offshore growout facility. This vessel may catch, retain, transport, transfer and offload scallops with a shell height less than 3 ½ inches in accordance with and subject to the following conditions and requirements:

1. This certificate must be carried on board this vessel during the period specified below.

2. This certificate must be accompanied by a valid Federal Atlantic sea scallop permit.

3. Scallops with a shell height less than 3 ½ inches may not be sold, and must be offloaded for transport to Ronald Smolowitz, a principle investigator for the project, or Dale Leavitt of the Woods Hole Oceanographic Institute in Woods Hole, Massachusetts.

4. This vessel's activity must be in compliance with all other current Federal fisheries regulations, including, but not limited to gear restrictions, days-at-sea and bycatch possession limits.

5. Failure to comply with all of the above provisions, or the provisions of the Magnuson Act, automatically voids this authorization as of the date of the violation and subjects the violator to fines and/or penalties.

PARTICIPATION PERIOD:

January 10, 1997 - October 31, 1997

AUTHORIZED BY:

I agree to comply with the conditions of this certificate.

Signature of Vessel Owner

This authorization is not valid unless signed by Thomas P. Phanuef.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930-2298

FEB 26 1997

Dear Fishery Constituent:

This letter is to inform you of the procedure to apply for an experimental fishing permit (EFP) to conduct experiments in the area of authority of the New England and the Mid-Atlantic Fishery Management Councils. Regulations requiring this review and approval of EFP's became effective on June 27, 1996.

An EFP is required by Federal regulations for limited testing, public display, data collection, exploration, health and safety, environmental cleanup, and/or hazard removal, if targeting or incidentally harvesting species managed under a fishery management plan or fishery regulations, or if an exemption to an activity that would otherwise be prohibited is required.

To apply for an EFP, applicants must submit an application 60 days before the desired effective date of the EFP. Submission of an EFP application less than 60 days before the desired effective date of the EFP may result in a delayed effective date.

An application for an EFP must contain the following information:

1) The date of the application.
2) The applicant's name, mailing address, and telephone number.
3) A statement of the purposes and goals of the experimental fishery for which an EFP is needed, including justification for the issuance of the EFP.
4) For each vessel to be covered by the EFP (as soon as the information is available - and before operations begin under the EFP):
   A) <u>If federally permitted</u>, the name and U.S. Coast Guard documentation or state registration number of the vessel.
   B) <u>If not federally permitted</u>, 1) a copy of the U.S. Coast Guard documentation, state license, or registration of each vessel, or the information contained on the appropriate document, and 2) the current name, address, and telephone number of the owner and master, if not included on the document provided for the vessel.
5) The species (target and incidental) expected to be harvested under the EFP, the amount(s) of such harvest necessary to conduct the experimental fishing, the arrangements for disposition of all regulated species harvested under the EFP, and any anticipated impacts on marine mammals or endangered species.
6) For each vessel covered by the EFP, the approximate time(s) and place(s) fishing will take place, and the type, size, and amount of gear to be used.
7) The signature of the applicant.

8) The Regional Administrator may request from the applicant additional information necessary to make the determinations required to approve an EFP. An incomplete application will not be considered until completed in writing.

After a review of the information is completed, the applicant will be informed of the preliminary evaluation which will determine whether or not the application warrants further consideration. If the application warrants further consideration, notification will be published in the Federal Register and an opportunity for the public to comment on the proposal will be afforded. Once comments have been evaluated, the applicant will be notified in writing of the decision to deny or grant the EFP. If approved, the applicant will be issued a permit to conduct operations described in the application.

Please send applications to: Andrew A. Rosenberg, Ph. D., Regional Administrator, National Marine Fisheries Service, 1 Blackburn Drive, Gloucester, MA 01930. If you have any questions regarding the experimental fishing permit program, please call Peter Christopher of my staff at (508)281-9288.

The Office of Management and Budget (OMB) requires potential respondents for an experimental fishing permit to be notified of certain information regarding their rights and the burden associated with applying for an EFP. This information is provided in the following attachment.

Sincerely,

Andrew A. Rosenberg, Ph. D.
Regional Administrator

Attachment

Experimental fishing permits are required for any vessel conducting fishing activity that would be prohibited under existing fishery regulations. Experimental fishing permits and programs serve several purposes. They offer flexibility to the fishing industry, reduce effort on depressed stocks by allowing vessels to concentrate on the less depleted stocks, and encourage innovation and efficiency in the fisheries.

The information collected as part of this application will allow NMFS to review the information and issue experimental fishing permits with consistency. It also insures that activities conducted within a fishery under protective management are not detrimental to that fishery and that activities are consistent with the goals, objectives and requirements of a fishery management plan. Appropriate comment on possible experimental fishing activities is provided by notifying the public and related agencies of the possible activities. In addition, reports submitted at the completion of approved experimental fishing activities will allow NMFS and related agencies to consider possible management schemes in existing fisheries and prosecution of alternative fisheries.

PRIVACY ACT STATEMENT: Under the provisions of the Privacy Act of 1974 (Public Law 93-579), no agency shall disclose any record which is contained in a system of records by any means of communication to any person, or to another agency, except pursuant to a written request by, or with the prior written consent of, the individual to whom the record pertains.

BURDEN STATEMENT: The information requested for experimental fishing permits is approved under OMB Control #0648-0309, and is approved for use through 4/30/99. Public reporting burden for this collection of information is estimated: (1) To average 1 hour per response to complete an application for an experimental fishing permit; and (2) to average 1 hour per response to collect information and provide a report at the conclusion of experimental fishing. Send comments regarding this burden estimate or suggestions for reducing the burden to: Gary Matlock, Director, Office of Sustainable Fisheries, NMFS, 1315 East-West Highway, Silver Spring, MD 20910.

Notwithstanding any other provision of law, no person is required to respond to nor shall a person be subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a current valid OMB Control Number.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930-2298

SEA SCALLOP
EXPERIMENTAL FISHING PERMIT

ISSUED TO: F/V DRAGON
DOCUMENTATION NUMBER: 507619
FEDERAL PERMIT NUMBER: 221761

This permit is issued in accordance with the Magnuson-Stevens Act Provisions, 50 CFR Part 600, §600.745, and Fisheries of the Northeastern United States regulations, 50 CFR Part 648, §648.12, and grants your request for an exemption from the transfer at sea restriction specified under 50 CFR 648, §648.13(c) while engaging exclusively in project activity as specified under 50 CFR Part 648, §648.56(a)(4)(ii) for the purpose of fishing within the Scallop Experimental Fishing Area (SEFA) specified under 50 CFR Part 648, §648.56(a)(1). For vessels engaged in activity collecting and transporting undersize scallops to the experimental area, two (2) DAS, per year, will be restored to their DAS allocation. Please note, however, that vessels participating in the experiment continue to be subject to the DAS requirements specified under 50 CFR part 648, §648.10, §648.53, the gear restrictions specified under 50 CFR part 648, §648.51 and all other requirements in §648.

In addition, this experimental fishing permit is granted subject to the following conditions:

1. This permit must be carried on board the vessel.

2. This vessel must be issued, and must carry on board, a valid Federal permit.

3. The experimental fishing program and this permit authorizing experimental fishing activity in conjunction with the project may be terminated by the Regional Administrator at any time at his discretion.

4. Failure to comply with all of the above provisions, or the provisions of the Magnuson-Stevens Act, automatically and immediately voids this authorization and subjects the violator to fines and/or permit sanctions.

Participation Period

October 20, 1997 - July 15, 1998

Authorized by

Dr. Andrew A. Rosenberg
Regional Administrator

I agree to comply with the conditions of this permit.

Signature of Vessel Owner

This authorization is not valid unless signed by Vessel Owner

WESTPORT SCALLOPING CORPORATION

113 MacArthur Drive
New Bedford, MA 02740
(508) 996-0525 * FAX 991-3227

November 19, 1997

Dr. Andrew Rosenberg
NMFS Regional Director
National Marine Fisheries Service
One Blackburn Drive
Gloucester, MA 01930

Re: S-K Grant NA66FD0027 Sea Scallop Enhancement and Sustainable Harvesting Project Experimental Fishery Request.

Dear Dr. Rosenberg,

I would like to take this opportunity to advise you of the status of our project and to request permission to collect scallops for seeding from within the Southern New England closed area.

In May, we located a scallop seed bed north of Cape Cod. We harvested the scallops with a lined dredge and transported them to our test site where we seeded about 35,000 scallops on the bottom. This summer we established three strings of bottom cages (48 cages). We located a bed of seed scallops on the northeast part of Georges and requested permission to line our dredge for the last tow of a commercial fishing trip to collect seed for the cages (we had a NMFS observer onboard at that time). This permission was denied by your staff. We then proceeded to harvest the seed during long commercial tows which caused much damage/stress. Short tows with legal rings will not retain small scallops. By the time we arrived at our test site, nearly a 20 hour trip, the seed was in bad shape. Warmer than usual water temperatures through the summer and fall did not help. The initial cage stock has suffered high mortality. Dedicated seed harvesting trips to this distant area would be very costly to the project.

We now have lantern net arrays ready for seeding in the water and also wish to restock the cages and bottom areas. The latest NMFS scallop survey indicates the presence of mixed scallop beds containing seed relatively close to our test site (five hour steam). Station # 246 (41 01, 69 11) would seem to be an ideal collection site however it is very rocky and the scallops come up in the dredge damaged. We propose to fish in the vicinity of NMFS Station #'s 238-241 (40-34 to 44-52; 69-08 to 69-18). These areas also contain rocks and cobbles but there are also areas of productive clean bottom. We would need about two days to harvest and transport the scallops we need, about 1500 bushels, with a lined dredge.

We would welcome NMFS observers onboard as this would be an excellent opportunity to compare the catches of a commercial dredge to the survey dredge. As you know, the industry is questioning the ability of the NMFS scallop survey to predict abundance and catch rates of commercial sized scallops in the groundfish closed areas. This comparison could provide some insight into this problem. More importantly, I firmly believe that the future of the scallop industry lies in pro-active management of scallop beds. By this I mean redistribution and seeding of scallops to maximize growth and control predation (man included).

In summary, I am requesting two days of fishing with a lined scallop dredge in the groundfish closed area in the vicinity of 1997 scallop survey stations #238-241 to be added to our existing experimental fishing permit. All scallops caught, not to exceed 1500 bushels, will be transported to the special scallop management area south of Marthas Vineyard and placed in cages, nets, or on the bottom. I look forward to a favorable reply to this request.

Sincerely,

Soren Hendriksen
President
Westport Scalloping Corporation

cc: NEFMC
Cong. B. Frank

COONAMESSETT FARM
277 Hatchville Road
East Falmouth, Massachusetts, USA 02536
508-564-5516 FAX 508-564-5073
cfarm@capecod.net

December 1, 1997

Mr. Jim O'Malley
Chairman, Sea Scallop Committee
New England Fishery Management Council
5 Broadway
Saugus, MA 01960

Re: **Proposed Sea Scallop FMP Research Program**

Dear Jim,

As you are well aware there are a number of short- and long-term research questions that need to be addressed for examining options related to sea scallop management. Some of these questions are:

1. What are the important scallop spawning areas for restocking the best scallop grow-out areas on Georges Bank and in Southern New England?

2. What is the size and species selectivity of commercial scallop dredges on different grounds compared to that of the NMFS sea scallop survey dredge?

3. What is the effectiveness of different measures to reduce fish by-catch by commercial scallop dredges?

4. Are there areas that routinely get good scallop sets but show poor survival? Can scallops be economically transferred from these areas to potentially good grow-out areas?

5. What would be the economic impact on a vessel fishing one eight foot dredge (with an 8-inch square mesh twine top) with a four man crew?

6. What are the habitat impacts of scallop dredging in different areas? What is the impact of otter trawling on scallop spawning and seed beds?

The above research list is far from being all inclusive but serves to show the range of critical questions that need to be addressed. The list covers subjects that need to be researched for EFH considerations, bycatch reduction, improving scallop production, access to groundfish closed areas, and alternative management approaches. More importantly, with a quick review of the list it becomes highly evident that the research will require extensive involvement by industry vessels. In addition, NMFS has indicated on numerous occasions that it does not have the manpower or financial resources to conduct this type of research program.

In light of the above situation I have proposed on a number of occasions incorporating a research program framework in the Sea Scallop FMP. The existing experimental fishery program has not allowed the above research needs to be addressed in any sort of reasonable and timely fashion. Existing grant programs can not be relied upon for funding and are piecemeal. In my opinion, a research program needs to be incorporated in the FMP with a framework process for updating. The cost of the program should be borne by the resource off the top. A logical way to accomplish this may be setting aside a number of DAS to compensate vessels participating in research activities. The exact means of choosing vessels and determining compensatory DAS should be a part of the FMP. This system should replace the existing experimental fishing protocol established by NMFS as it would entail a more logical and much greater public process. The experimental fishing permit should be a standardized document just requiring signatures. I have been involved with this process enough to know that this is possible.

I hope you consider this proposal and place it on the Scallop Committee's agenda as soon as possible. I do not think we can make any progress on key issues until the above program is in place. Thank you.

Sincerely,

Ronald Smolowitz

COONAMESSETT FARM
277 Hatchville Road
East Falmouth, MA 02536
508-564-5516
FAX 508-564-5073

January 13, 1998

Mr. Joseph Brancaleone, Chairman
New England Fisheries Management Council
5 Broadway Suntaug Office Park
Saugus, MA 01906-1097

Re: Sea Scallop Experimental Area

Dear Joe,

We would like to formally request that the Council extend the closure time period of the Sea Scallop Experimental Area (Seastead Site) south of Marthas Vineyard for at least three more years. We have verbally requested, through Paul Howard, that time be made available at a full Council meeting to present the results of our efforts in the Seastead Site to date as a means of starting the discussion process. We would also propose that the Seastead Site use be extended to allow research into habitat impact of fishing and aquaculture in general.

This request will hopefully serve to also kick-start the long-range planning process for sea scallop management, aquaculture, and essential fish habitat. Sea scallop harvesting is in our opinion one of these most important factors influencing New England fisheries. It impacts not only scallop production but the production and management of all species in these waters. The impacts are direct, through habitat alteration, and indirect, through redirection of scallop fishermen into alternative fisheries.

Attached are two letters that are germane to this discussion. The first is a letter that I sent Jim O'Malley regarding a sea scallop research program. Any program of this nature would benefit significantly from a dedicated long-term research area such as we are proposing for the Seastead Site. The second letter is from Westport Scalloping Corporation to NMFS requesting permission to harvest scallops for stocking the Seastead Site. It would be beneficial to monitor what happens to these scallops over the long-term, beyond the limited duration of our current NMFS-sponsored project. Such studies would include the ecological relationships between scallops, crabs, starfish, sand dollars, and other organisms.

The substrate and environmental parameters at this site are very typical of many areas on Georges and off southern New England. This is a good location for researchers to start understanding ecosystem relationships on a fine scale. We propose that the technical team currently supporting the Westport Project would act as a body to coordinate the extended use by the Project and cooperative use by other researchers.

If there is anything else we need to do to get this process moving please let me know.

Sincerely,

Ronald Smolowitz
PI, Westport Project

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930-2298

Experimental Fishing Permit

Issued to the Westport Scalloping Corporation for the F/V Westport Documentation #619338, Federal Permit #410249

Project Coordinator: Soren Henriksen, President
Westport Scalloping Corporation
113 MacArthur Drive
New Bedford, MA 02740

This permit is issued in accordance with the Magnuson-Stevens Act Provisions, 50 CFR Part 600, §600.745, and the Fisheries of the Northeastern United States regulations, 50 CFR Part 648, §648.12.

Westport Scalloping Corporation has been approved to conduct experimental fishing activity in conjunction with a NMFS sponsored project (Saltonstall-Kennedy grant program-NOAA Award NA 66FD0027) designed to allow for the conduct of a sea scallop mariculture research project. A small mesh-lined sea scallop dredge will be installed to allow the catch of small scallops. This vessel may catch, retain, and land scallops with a sea scallop dredge within the Nantucket Lightship Closed Area (NLCA) without accruing in a days-at-sea (DAS) program in accordance with and subject to the following conditions and requirements:

1. This experimental fishing permit must be carried on board this vessel during the period specified below.

2. This experimental fishing permit must be accompanied by a valid Federal Atlantic sea scallop permit.

3. This vessel may conduct a maximum of two days of fishing under this permit and restricted to the area of the 1997 NMFS Survey Station #'s 238-241 (40°34'N. to 44°52'N. and 69°08'W. to 69°19'W.)(see attached chart).

4. This vessel may retain a maximum of 1500 bushels of small seed scallops when fishing under this permit and off-load the small seed scallops into the Scallop Experimental Fishing Area (SEFA) specified under 50 CFR Part 648, §648.56(a)(1).

5. This vessel is restricted from the landing or possession of any species other than scallops mentioned under condition #4.

6. Soren Henriksen, Ronald Smolowitz or their designee must be on board this vessel when fishing under this permit.

7. The Office of Law Enforcement must be notified at (508)992-7711 before this vessel leaves port to engage in fishing activities authorized by this permit and when the vessel returns to port after engaging in such fishing activities.

8. Failure to comply with any of the above provisions, or the provisions of the Magnuson-Stevens Act, automatically renders this authorization null and void as of the date of the violation and may subject the violator to fines and/or permit sanctions.

Participation Period:

April 17, 1998 - July 15, 1998

Authorized By:

Andrew A. Rosenberg, Ph.D.
Regional Administrator

I agree to comply with the conditions of this experimental fishing permit.

Signature of Vessel Owner

This experimental fishing permit is not valid unless signed by Vessel Owner.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930-2298

AUG 27 1998

Dear Permit Holder:

Framework 10 to the Atlantic Sea Scallop Management Plan (FMP) has been approved. This framework extends the measures approved under Amendment 5 to the FMP and authorizes an 18 month closure period to allow scientists and technical experts, in cooperation with fishers, to conduct an experiment and demonstration project involving sea scallop research, enhancement and aquaculture. The action closes a nine square mile site to mobile fishing gear, partially closes the site to non-mobile gear, and temporarily exempts vessels participating in the experiment from fishing regulations. The area will be closed between August 28, 1998, through February 28, 2000. The area is:

Sea Scallop Experimental Fishing Area

Point	Latitude	Longitude
1	41°11.8' N.	70°50' W.
2	41°11.8' N.	70°46' W.
3	41°08.8' N.	70°46' W.
4	41°08.8' N.	70°50' W.

The action prohibits fishing activities within the Scallop Experimental Fishing Area, except handgear fishing. Fishing with lobster pots, traps, and longline gear is also permitted provided you apply for and obtain an allowed gear permit (AGP) issued by the Regional Administrator. If your vessel will be participating in project activities within or outside of the area, you will need to apply for an experimental fishing permit (EFP) from the Regional Administrator.

You may use the attached form to apply for an AGP or EFP. Applications must be received at least 30 days before the desired effective date of the AGP or EFP. Vessels receiving AGPs may be required to move their gear within, or remove their gear from, the area upon notification by the Regional Administrator. All vessels receiving AGPs or EFPs must comply with any additional restrictions specified in the permit.

For more information, please call (978)281-9273.

Sincerely,

Jon C. Rittgers
Acting Regional Administrator

SEA SCALLOP FISHING AREA
ALLOWED GEAR/EXPERIMENTAL FISHING
PERMIT APPLICATION

Date of Application (30 days prior to start of fishing trip) _____

Type of Permit (Check One):

Allowed Gear Permit _____ Experimental Gear Permit _____

Applicant's Name _____

Applicant's Address _____

_____

Applicant's Telephone _____

Applicant's FAX Number _____

Vessel Name _____

Owner's Name _____

Owner's Address _____

_____

Owner's Telephone _____

NMFS Permit Number _____

Coast Guard Documentation Number _____

Species Expected to Harvest:

Target _____

Incidental _____

Fill-in All That Apply:

Gear Type _____ Size _____ Buoy Colors _____

Trap Identification Markings _____

Amount of Gear That Will Be Used _____

Exact Time(s) Fishing Will Take Place in the Scallop Experimental Fishing Area

_____

_____

_____

_____

_____

_____

Permit Holder's Name (printed)

_____

Permit Holder's Signature

Return this form 30 days prior to fishing trip to: NMFS, Attn.: Scallop Experimental Area Permit, 1 Blackburn Drive, Gloucester, MA 01930

Issued in Fort Worth, TX, on August 21, 1998.

JoEllen Casilio,

Assistant Manager, Air Traffic Division, Southwest Region.

[FR Dos. 98–23139 Filed 8–27–98; 8:45 am]

BILLING CODE 4910–13–M

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 71

[Airspace Docket No. 98–ASW–29]

Revision of Class E Airspace; Grand Isle, LA

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Direct final rule; confirmation of effective date.

SUMMARY: This notice confirms the effective date of a direct final rule which revises Class E airspace at Grand Isle, LA.

EFFECTIVE DATE: The direct final rule published at 63 FR 31355 is effective 0901 UTC, October 8, 1998.

FOR FURTHER INFORMATION CONTACT: Donald J. Day, Airspace Branch, Air Traffic Division, Southwest Region, Federal Aviation Administration, Fort Worth, TX 76193–0520, telephone: 817–222–5593.

SUPPLEMENTARY INFORMATION: The FAA published this direct final rule with a request for comments in the Federal Register on June 9, 1998 (63 FR 31355). The FAA uses the direct final rulemaking procedure for a non-controversial rule where the FAA believes that there will be no adverse public comment. This direct final rule advised the public that no adverse comments were anticipated, and that unless a written adverse comment, or a written notice of intent to submit such an adverse comment, were received within the comment period, the regulation would become effective on October 8, 1998. No adverse comments were received, and thus this action confirms that this direct final rule will be effective on that date.

Issued in Fort Worth, TX, on August 21, 1998.

JoEllen Casilio,

Assistant Manager, Air Traffic Division, Southwest Region.

[FR Doc. 98–23138 Filed 8–27–98; 8:45 am]

BILLING CODE 4910–13–M

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

15 CFR Part 902

50 CFR Part 648

[Docket No. 980817220–8220–01; I.D. 081098A]

RIN 0648–AL17

Fisheries of the Northeastern United States; Framework 10 to the Atlantic Sea Scallop Fishery Management Plan

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Final rule.

SUMMARY: NMFS issues this final rule to implement measures contained in Framework Adjustment 10 to the Atlantic Sea Scallop Fishery Management Plan (FMP). These regulations extend the closure of a 9 mi^2 (23.31 km^2) site to transiting and fishing with other than hand gear for an 18-month period to allow for the conduct of a NMFS-sponsored sea scallop aquaculture research project. This rule provides for exemptions from the closure for vessels using certain gear types and for vessels participating in the project. Finally, this rule provides for the temporary exemption for vessels participating in the project from certain fishing regulations that might inhibit or prevent their participation. This action is intended to support an aquaculture research project and prevent conflicts between fishing gear and project equipment for the limited duration of the research project.

DATES: Effective August 28, 1998 through February 28, 2000.

ADDRESSES: Copies of Amendment 5 to the FMP (Amendment 5), its regulatory impact review and the final regulatory flexibility analysis, its final supplemental environmental impact statement, and the supporting documents for Framework Adjustment 10 are available from Paul J. Howard, Executive Director, New England Fishery Management Council, 5 Broadway (Route 1), Saugus, MA 01906–1097.

Comments regarding burden-hour estimates for collection-of-information requirements contained in this final rule should be sent to Jon Rittgers, Acting Regional Administrator, 1 Blackburn Drive, Gloucester, MA 01930, and the Office of Information and Regulatory Affairs, Office of Management and Budget (OMB), Washington, D.C. 20502 (ATTN: NOAA Desk Officer).

FOR FURTHER INFORMATION CONTACT: Paul H. Jones, Fishery Policy Analyst, 978–281–9273.

SUPPLEMENTARY INFORMATION:

Background

Regulations implementing Amendment 5 to the FMP (62 FR 1829) were published on January 14, 1997. Details of that action are described in the preamble to the final rule and will not be repeated here. The final rule closed a 9 mi^2 (23.31 km^2) area closure approximately 12 mi (22.22 km) southwest of the island of Martha's Vineyard, MA, to transiting and fishing with other than handgear for an 18-month period to allow for the conduct of a NMFS-sponsored sea scallop aquaculture research project. The final rule provided for exemptions from the closure for vessels using certain gear types and for vessels participating in the project. The final rule provided temporary exemptions for vessels participating in the project from certain fishing regulations, which may have inhibited or prevented their participation.

Current scallop regulations allow for the adjustment of management measures, as necessary to meet or achieve consistency with the FMP's goals and objectives. The regulations authorize the New England Fishery Management Council (Council) to recommend adjustments to any of the measures currently in the FMP.

Framework Adjustment 10 continues the experimental closure established under Amendment 5 to the FMP. The success of the experiment is dependent on retaining the restrictions established by Amendment 5. The objective of the project is to obtain a comprehensive understanding of issues associated with scallop seeding and grow-out. These activities and required environmental monitoring require the continuation of restricted activities within the experimental area. Without controls on fishing, expensive grow-out and monitoring equipment could be inadvertently destroyed by towed gear.

The Council requests publication of the management measures as a final rule after considering the required factors stipulated in the regulations governing the Atlantic sea scallop fishery and providing supporting analysis for each factor considered. The Administrator, Northeast Region, NMFS (Regional Administrator) concurs with the Council's recommendation and has determined that Framework Adjustment 10 should be published as a final rule.

cc: AQ ADV.
CBSC LIC PLIF (8/31)

NMFS is adjusting the scallop regulations following the procedure for framework adjustments established by Amendment 4 and codified in 50 CFR part 648. The Council followed this procedure when making adjustments to the FMP by developing and analyzing the actions over the span of a minimum of two Council meetings held on April 15–16, 1998, and May 20–21, 1998.

Comments and Responses

The April 1998 Council meeting was the first of two meetings that provided an opportunity for public comment on Framework Adjustment 10. A draft document containing the proposed management measures and their rationale was available to the public during the third week in May 1998. Notification of the initial and final Council meetings were mailed to approximately 1,900 people and were published in the **Federal Register**. Individuals and associations representing user groups who initially objected to the original location of the Sea Scallop Experimental Area were also contacted by mail. The final public hearing was held on May 20–21, 1998. Testimony provided by industry members at the public meetings favored the framework adjustment. There were no negative comments.

Under NOAA Administrative Order 205–11, 7.01, dated December 17, 1990, the Under Secretary for Oceans and Atmosphere has delegated to the Assistant Administrator for Fisheries, NOAA (AA), the authority to sign material for publication in the **Federal Register**.

Classification

The Regional Administrator determined that this final rule is necessary for the conservation and management of the Atlantic sea scallop fishery and that it is consistent with the Magnuson-Stevens Fishery Conservation and Management Act and other applicable law.

This final rule has been determined to be not significant for the purposes of E.O. 12866.

The AA finds that there is good cause to waive prior notice and opportunity for comment under 5 U.S.C. 553(b)(B) because such procedures would be unnecessary. Public meetings held by the Council to discuss the management measures implemented by this rule provided adequate prior notice and an opportunity for public comment to be heard and considered; therefore, further notice and opportunity to comment before this rule is effective is unnecessary. Similarly, the need to implement these measures in a timely manner to prevent possible damage to expensive grow-out and monitoring equipment inadvertently destroyed by towed gear constitutes good cause under 5 U.S.C. 553(d)(3) to waive the 30-day delay in effectiveness.

Because prior notice and opportunity for public comment are not required for this rule by 5 U.S.C. 553 or by any other law, the analytical requirements of the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*, are inapplicable.

Notwithstanding any other provision of law, no person is required to respond to nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act (PRA) unless that collection of information displays a currently valid OMB control number.

This rule contains one collection-of-information requirement subject to the PRA. This collection-of-information requirement has been approved by OMB, and the OMB control number and public reporting burden are listed as follows: Sea Scallop Experimental Area authorization request, (0.5 hours/response) under OMB control number 0648–0321.

The estimated response time includes the time needed for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection-of-information. Public comment is sought regarding: whether this collection of information is necessary for the proper performance of the functions of the agency, including whether the information has practical utility; the accuracy of the burden estimate; ways to enhance the quality, utility, and clarity of the information to be collected; and ways to minimize the burden of the collection of information, including through the use of automated collection techniques or other forms of information technology. Send comments regarding this burden estimate, or any other aspect of this data collection to NMFS and OMB (see **ADDRESSES**).

List of Subjects

15 CFR Part 902

Reporting and recordkeeping requirements.

50 CFR Part 648

Fisheries, Fishing, Reporting and recordkeeping requirements.

Dated: August 24, 1998.

Rolland A. Schmitten,

Assistant Administrator for Fisheries, National Marine Fisheries Service.

For the reasons set out in the preamble, 15 CFR Chapter IX and 50 CFR Chapter VI are amended as follows:

15 CFR CHAPTER IX

PART 902—NOAA INFORMATION COLLECTION REQUIREMENTS UNDER THE PAPERWORK REDUCTION ACT; OMB CONTROL NUMBERS

1. The authority citation for part 902 continues to read as follows:

Authority: 44 U.S.C. 3501 *et seq.*

2. In § 902.1, paragraph (b), the table is amended by adding in the left column under 50 CFR, the entry "648.56", and in the right column, in the corresponding position, the control number "–0321" to read as follows:

§ 902.1 OMB control numbers assigned pursuant to the Paperwork Reduction Act.

* * * * *

(b) * * *

CFR part or section where the information collection requirement is located	Current OMB control number (all numbers begin with 0648–)
* * * * *	
50 CFR	
* * * * *	
§ 648.56	0321
* * * * *	

50 CFR CHAPTER VI

PART 648—FISHERIES OF THE NORTHEASTERN UNITED STATES

3. The authority citation for part 648 continues to read as follows:

Authority: 16 U.S.C. 1801 *et seq.*

4. In § 648.14, paragraph (a)(97) is added to read as follows:

§ 648.14 Prohibitions.

(a) * * *

(97) Fish in or transit the Scallop Experimental Area defined in § 648.56(a)(1), except as provided for in § 648.56 (a)(2) and (a)(3).

* * * * *

5. Section 648.56 is added to subpart D to read as follows:

§ 648.56 Scallop research project.

(a)(1) *Scallop experimental area.* From August 28, 1998 through February 28, 2000, no fishing vessel or person on

a fishing vessel may transit or fish with other than handgear in the area known as the Sea Scallop Experimental Area, as defined by straight lines connecting the following points in the order stated, except as described in paragraphs (a)(2) and (a)(3) of this section:

Point	Latitude	Longitude
1	41°11.8′ N.	70°50′ W.
2	41°11.8′ N.	70°46′ W.
3	41°08.8′ N.	70°46′ W.
4	41°08.8′ N.	70°50′ W.

(2) *Exemptions.* A fishing vessel and persons on a fishing vessel may transit or fish in the Sea Scallop Experimental Area under the following conditions only:

(i) The vessel has been issued an allowed gear permit (AGP) under paragraph (a)(4)(i) of this section and is fishing with pot gear, traps, longline gear, or any other gear determined by the Regional Administrator as unlikely to interfere with the sea scallop aquaculture research project in the Sea Scallop Experimental Area; or

(ii) The vessel has been issued an experimental fishing permit (EFP) under paragraph (a)(4)(i) of this section to participate in the sea scallop aquaculture research project in the Sea Scallop Experimental Area.

(3) *Transiting.* Vessels that are not exempted from the prohibition against transiting and fishing in the Sea Scallop Experimental Area under paragraph (a)(2) of this section may transit such area provided that their gear is stowed in accordance with the provisions of § 648.81(e).

(4) *Allowed gear and experimental fishing permits*—(i) *Allowed gear permits.* The Regional Administrator may issue an AGP to any vessel to fish within the Sea Scallop Experimental Area with the gear specified in paragraph (a)(2)(i) of this section. Vessels receiving AGPs may be required to move their gear within, or remove their gear from, the area upon notification by the Regional Administrator and must comply with any additional restrictions specified in the permit.

(ii) *Experimental fishing permits.* The Regional Administrator may issue an EFP under the provisions of § 648.12, and consistent with paragraph (a)(4)(iv) of this section, to any vessel participating in the sea scallop aquaculture research project to engage in any of the following activities; fish in the Sea Scallop Experimental Area; use fishing gear that does not conform to the regulations; possess scallops when not fishing under a DAS allocation; use up to an additional 2 DAS per year when collecting and transporting undersized scallops to the Sea Scallop Experimental Area; and do any other activity necessary to project operations for which an exemption from regulatory provision is required. Vessels issued an EFP must comply with all conditions and restrictions specified in the permit.

(iii) A vessel with an AGP or EFP must carry the permit on board the vessel while fishing in the Sea Scallop Experimental Area or participating in the scallop aquaculture project.

(iv) The Regional Administrator may not issue an AGP or EFP unless he determines that issuance is consistent with the objectives of the FMP, the provisions of the Magnuson-Stevens Act, and other applicable law and will not:

(A) Have a detrimental effect on the sea scallop resource and fishery;

(B) Create significant enforcement problems; or

(C) Have a detrimental effect on the scallop project.

(5) *Application.* An application for an AGP or EFP must be in writing to the Regional Administrator and be submitted at least 30 days before the desired effective date of the permit. The application must include, but is not limited to, the following information:

(i) The date of application.

(ii) The applicant's name, current address, telephone number and fax number, if applicable.

(iii) The current vessel name, owner address, and telephone number.

(iv) The vessel's Federal permit number.

(v) The USCG documentation number.

(vi) The species (target and incidental) expected to be harvested.

(vii) The gear type, size, buoy colors, trap identification markings and amount of gear that will be used; and exact time(s) fishing will take place in the Sea Scallop Experimental Area.

(viii) The signature of the applicant.

(b) [Reserved]

[FR Doc. 98–23181 Filed 8–27–98; 8:45 am]

BILLING CODE 3510–22–P

FEDERAL TRADE COMMISSION

16 CFR Part 305

Rule Concerning Disclosures Regarding Energy Consumption and Water Use of Certain Home Appliances and Other Products Required Under the Energy Policy and Conservation Act ("Appliance Labeling Rule")

AGENCY: Federal Trade Commission.

ACTION: Final rule.

SUMMARY: The Federal Trade Commission ("Commission") amends its Appliance Labeling Rule by publishing new ranges of comparability to be used on required labels for instantaneous water heaters. The Commission also announces that the current ranges of comparability for room air conditioners, storage-type water heaters, heat pump water heaters, pool heaters, furnaces, boilers, and dishwashers will remain in effect until further notice.

EFFECTIVE DATE: November 27, 1998.

FOR FURTHER INFORMATION CONTACT: James Mills, Attorney, Division of Enforcement, Federal Trade Commission, Washington, DC 20580 (202–326–3035).

SUPPLEMENTARY INFORMATION: The Appliance Labeling Rule ("Rule") was issued by the Commission in 1979 (44 FR 66466 (Nov. 19, 1979)) in response to a directive in the Energy Policy and Conservation Act of 1975.[1] The Rule covers eight categories of major household appliances: refrigerators and refrigerator-freezers, freezers, dishwashers, clothes washers, water heaters (this category includes storage-type water heaters, instantaneous water heaters, and heat pump water heaters), room air conditioners, furnaces (this category includes boilers), and central air conditioners (this category includes heat pumps). The Rule also covers pool heaters (59 FR 49556 (Sept. 28, 1994)), and contains requirements that pertain to fluorescent lamp ballasts (54 FR 28031 (July 5, 1989)), certain plumbing products (58 FR 54955 (Oct. 25, 1993)), and certain lighting products (59 FR 25176 (May 13, 1994)).

The Rule requires manufacturers of all covered appliances and pool heaters to disclose specific energy consumption or efficiency information (derived from the DOE test procedures) at the point of sale in the form of an "EnergyGuide" label and in catalogs. It also requires manufacturers of furnaces, central air conditioners, and heat pumps either to provide fact sheets showing additional cost information, or to be listed in an industry directory showing the cost information for their products. The Rule requires that manufacturers include, on labels and fact sheets, an energy consumption or efficiency figure and a "range of comparability." This range shows the highest and lowest energy consumption or efficiencies for all comparable appliance models so

[1] 42 U.S.C. 6294. The statute also requires DOE to develop test procedures that measure how much energy the appliances use, and to determine the representative average cost a consumer pays for the different types of energy available.

APPENDIX F

FMP Amendment Development

SeaStead Project

Coonamessett Farm

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Sea Grant College Program

August 25, 1994

Mr. Douglas Marshall, Executive Director
New England Fisheries Management Council
Suntaug Office Park
Saugus, MA 01906

Dear Doug,

I am writing on behalf of Westport Scalloping Corporation to request the New England Council's assistance and support in a scallop resource enhancement project. Enclosed you will find a copy of a proposal, submitted for NFIG funding, to conduct sea scallop enhancement south of Martha's Vineyard. The applicant, Westport Scalloping Corporation, will be supported in the project by seven other commercial fishing operations, MIT Center for Fisheries Engineering Research, NET Systems (USA's largest fishing gear company), Martha's Vineyard Shellfish Group, Conservation Law Foundation, Coonamessett Farm, and others. The proposal outlines most of the details.

We are proceeding with several actions independent of the proposal's funding. We are requesting a permit from the Army Corps of Engineers to place moorings at our proposed 3-mile by 3-mile test site. The moorings will serve to hold scallops, mark the proposed test site, and monitor conditions.

We would like to explain our project to the full Council and request the Council to close the site to commercial fishing operations, other than those involved in the project, for a period of eighteen months to allow for the completion of the research project and review by the Council of our results. At that time the Council may decide to continue the closure for additional purposes. There may be some further management/regulatory issues that we will ask the Council to address.

There is no doubt in our minds that New England can be the center of a billion dollar sustainable shellfish industry if we all work towards that goal together. Please let us know when would be the earliest occasion that we could be placed on the Council meeting agenda. Thank you.

Sincerely,

Clifford A. Goudey
project director, Center for Fisheries Engineering Research

Encl.

Room E38-300 292 Main Street Cambridge, Massachusetts 02139 617/253-7041 FAX 617/258-5730

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Sea Grant College Program

August 25, 1994

Grant Kelly
US Army Corps of Engineers, Regulatory Division
New England Division
425 Trapelo Road
Waltham, MA 02254-9149

Dear Mr. Kelly:

On behalf of Westport Scalloping Corporation I am submitting an application for the placement of buoys and other structures associated with a proposed sea scallop enhancement and grow-out project. A copy of a proposal, submitted to NMFS for NFIG funding, is included and should explain out intentions fully.

We have carefully chosen the proposed site for the following reasons:

1. Vicinity to New Bedford, home port of the Westport Scalloping Corp.
2. Present low level of commercial fishing activity.
3. Sandy bottom, moderate currents, and protection from the north.
4. Good productivity potential though historically few scallops set there.

We are discussing with the New England Fisheries Management Council our need to have the proposed site closed to normal commercial fishing activity. We have requested an opportunity to present our proposal at a Council meeting. Similarly, we are anxious to see that our plans meet the requirements of the Corps and look forward to sitting with you in a pre-application meeting to discuss our approach.

Thank you for your consideration. I look forward to hearing from you. My phone at MIT is 617-253-7079.

Sincerely,

Clifford. A. Goudey
project director, Center for Fisheries Engineering Research

Encl.

Room E38-300 292 Main Street Cambridge, Massachusetts 02139 617/253-7041 FAX 617/258-5730

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT
(33 CFR 325)

OMB APPROVAL NO. 0710-0003
Expires 30 September 1992

Public reporting burden for this collection of information is estimated to average 5 hours per response for the majority of cases, including the time for reviewing instruction searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Applications for larger or more co[illegible]ex projects, or those in ecologically sensitive areas, could take up to 500 hours. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Service, Directorate for Information Operations and Projects, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302; and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003), Washington, DC 20503. **Please DO NOT RETURN your completed form to either of these addresses. Completed application must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.**

The Department of the Army permit program is authorized by Section 10 of the Rivers and Harbors Act of 1899, Section 404 of the Clean Water Act and Section 103 of the Marine Protection, Research and Sanctuaries Act. These laws require permits authorizing activities in or affecting navigable waters of the United States, the discharge of dredged or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters. Information provided on this form will be used in evaluating the application for a permit. Information in this application is made a matter of public record through issuance of a public notice. Disclosure of the information requested is voluntary; however, the data requested are necessary in order to communicate with the applicant and to evaluate the permit application. If necessary information is not provided, the permit application cannot be processed nor can a permit be issued.

One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

1. APPLICATION NUMBER (To be assigned by Corps)

2. NAME AND ADDRESS OF APPLICANT

Westport Scalloping Corporation
113 MacArthur Drive
New Bedford, MA 02740

Telephone no. during business hours

A/C ( ) _____ (Residence)
A/C (508) 996-0525 (Office)

3. NAME, ADDRESS, AND TITLE OF AUTHORIZED AGENT

Clifford A. Goudey
project director
Center for Fisheries Engeering Research

Telephone no. during business hours

A/C (617 241-8714 (Residence)
A/C (617 253-7079 (Office)

Statement of Authorization: I hereby designate and authorize Clifford A. Goudey of MIT to act in my behalf as my agent in the processing of this permit application and to furnish, upon request, supplemental information in support of the application.

SIGNATURE OF APPLICANT

DATE 8-25-94

4. DETAILED DESCRIPTION OF PROPOSED ACTIVITY

4a. ACTIVITY

- The installation and operation of an experimental scallop enhancement and grow-out site as described in the attached drawings and proposal. We propose the use of four corner buoys (as shown in "site plan"), 27 lane marker buoys (as shown in "site plan") and the placement of a moored grow-out array (as shown in "array plan" and "array elevation").

4b. PURPOSE

- The development and demonstration of a sustainable method of scallop production. We will transfer small scallop to the site for grow-out under controlled conditions. Some scallop seed will be placed in suspended grow-out units to evaluate the advantages of off-bottom culture. Other scallop seed will be scattered in grow-out lanes where growth will be monitored and ultimate harvesting timed for optimum yield. Work will begin in December 1994 with installation complete by June 1995.

4c. DISCHARGE OF DREDGED OR FILL MATERIAL

None

5. NAMES AND ADDRESSES OF ADJOINING PROPERTY OWNERS, LESSEES, ETC., WHOSE PROPERTY ALSO ADJOINS THE WATERWAY

None

6. WATERBODY AND LOCATION ON WATERBODY WHERE ACTIVITY EXISTS OR IS PROPOSED

Atlantic Ocean. eight miles south of Martha's Vineyard. The northwest corner of the three-mile square site is at 41° 13' N / 70° 40' W and is in approximately 96 feet of water.

7. LOCATION ON LAND WHERE ACTIVITY EXISTS OR IS PROPOSED

ADDRESS:

STREET, ROAD, ROUTE OR OTHER DESCRIPTIVE LOCATION

COUNTY STATE ZIP CODE

LOCAL GOVERNING BODY WITH JURISDICTION OVERSITE

8. Is any portion of the activity for which authorization is sought now complete? ☐ YES ☒ NO
If answer is "yes" give reasons, month and year the activity was completed. Indicate the existing work on the drawings.

9. List all approvals or certifications and denials received from other federal, interstate, state or local agencies for any structures, construction, discharges or other activities described in this application.

ISSUING AGENCY	TYPE APPROVAL	IDENTIFICATION NO.	DATE OF APPLICATION	DATE OF APPROVAL	DATE OF DENIAL
None					

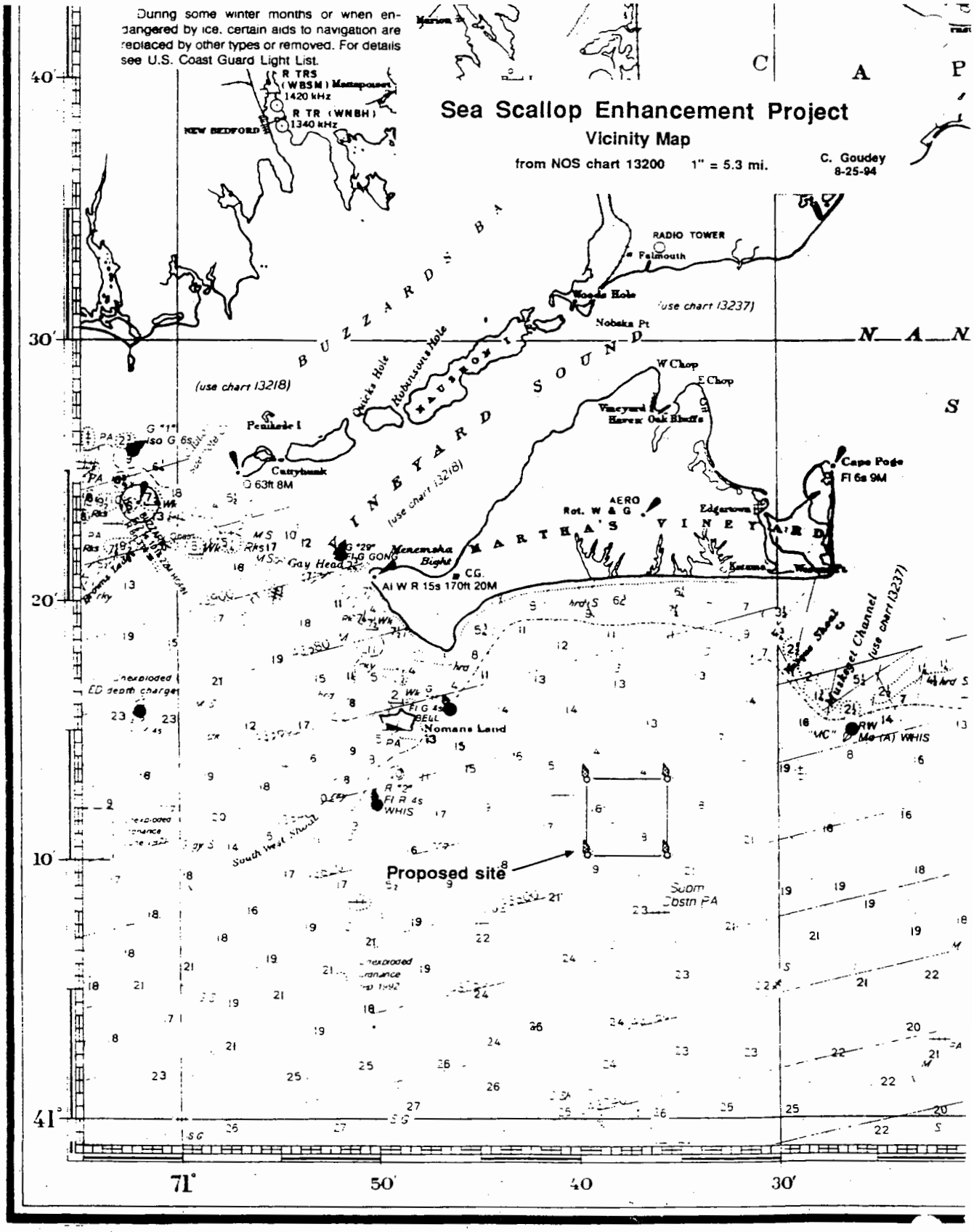
10. Application is hereby made for a permit or permits to authorize the activities described herein. I certify that I am familiar with the information contained in the application, and that to the best of my knowledge and belief such information is true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities or I am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT DATE SIGNATURE OF AGENT DATE

The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 3 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of The United States knowingly and willfully falsifies, conceals, or covers up by any trick, scheme, or device a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false fictitious or fraudulent statement or entry, shall be fined not more than $10,000 or imprisoned not more than five years, or both.

U.S. Government Printing Office: 1991 — 52



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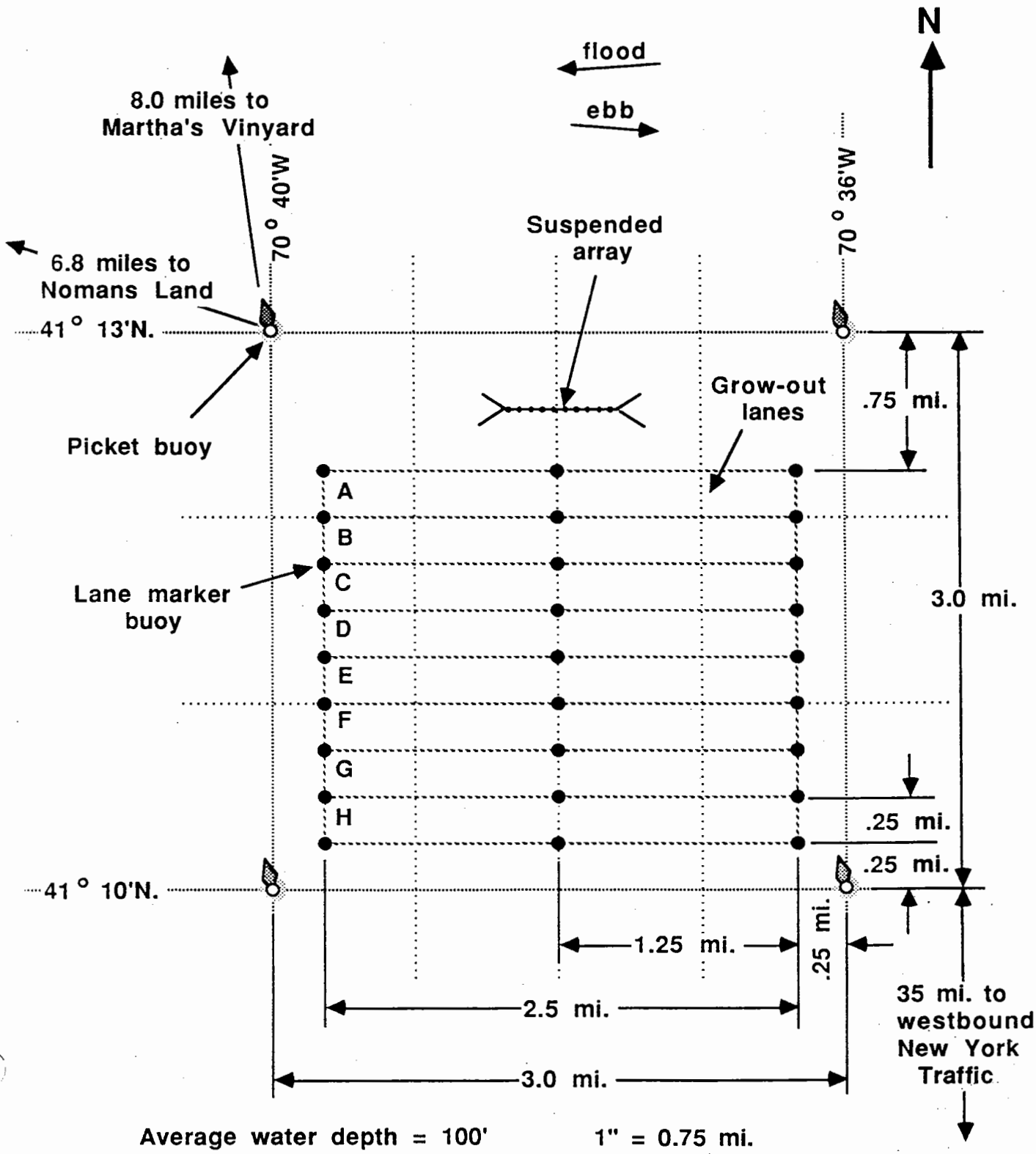
Notice to Mariners published ... Hydrographic Topographic ... the Local Notice to ... Coast Guard ... to the

C. Goudey
8-25-94

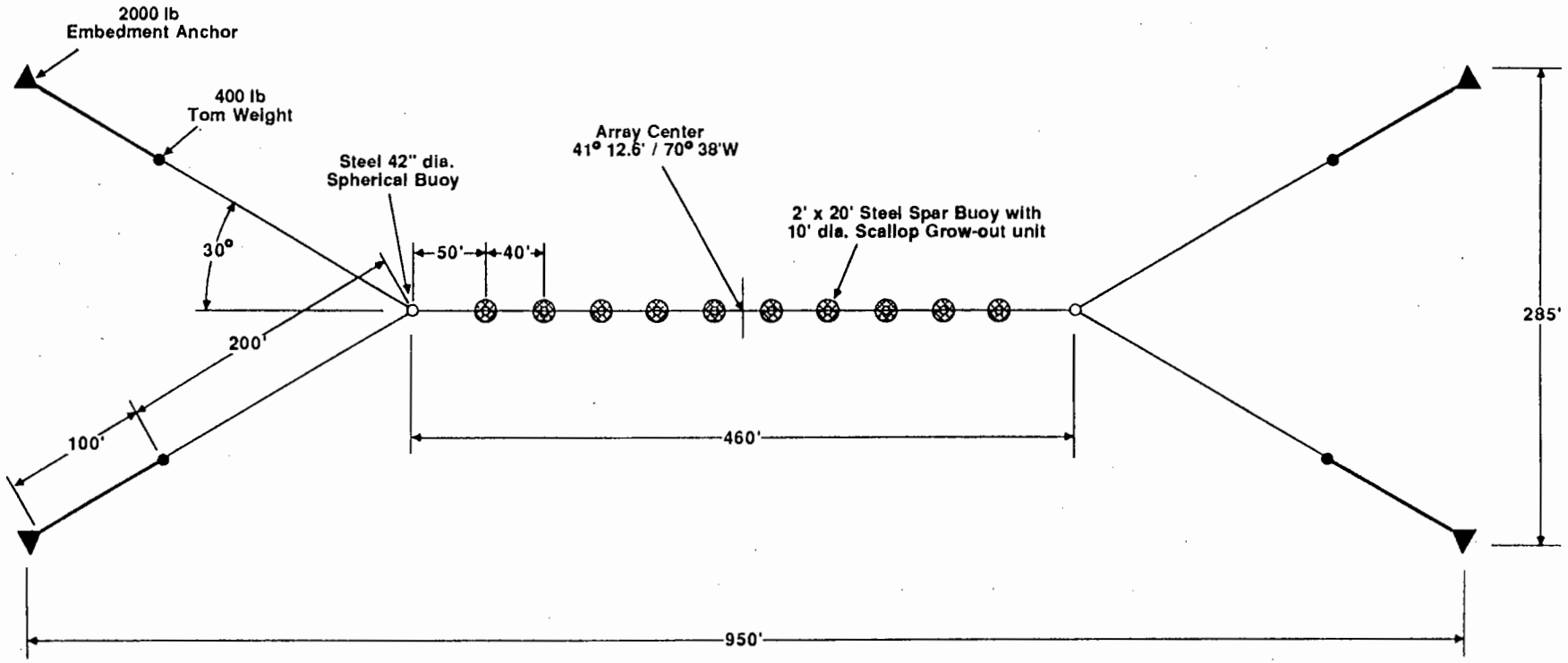
Sea Scallop Enhancement Project

Site Plan



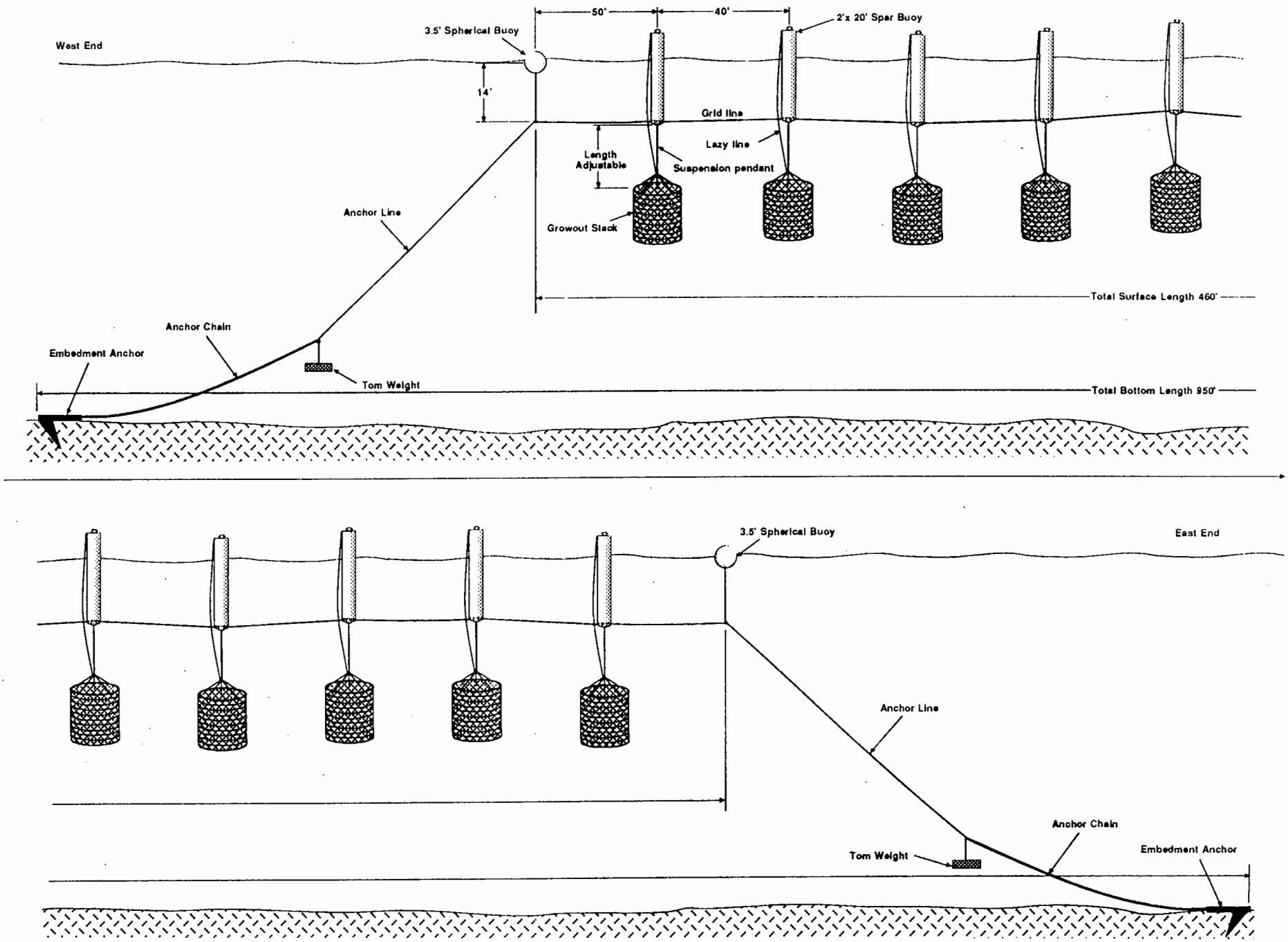
Sea Scallop Grow-out System - Array Plan

C . Goudey
8-25-94



Sea Scallop Grow-out System - Array Elevation

C. Goudey
8-25-94



Scallop Enhancement Project

Schedule of Buoys

C. Goudey
8/25/94

No.	Name	Description	Lat. N.	Long. W.	Depth ft	Anchor lbs	Anchor line
1	NW Picket	4' dia. x 10' lighted	41°13'	70°40'	96	1500	200' chain
2	NE Picket	4' dia. x 10' lighted	41°13'	70°36'	100	1500	200' chain
3	SW Picket	4' dia. x 10' lighted	41°10'	70°40'	100	1500	200' chain
4	SE Picket	4' dia. x 10' lighted	41°10'	70°36'	104	1500	200' chain
5	W Sphere	3.5' dia.	41°12.6'	70°38.11'	98	2 x 2000	300' Syn. & chain
6	E Sphere	3.5' dia.	41°12.6'	70°37.89'	98	2 x 2000	300' Syn. & chain
7	Spar 1	2' dia. x 20'	41°12.6'	70°38.09'	98		
8	Spar 2	2' dia. x 20'	41°12.6'	70°38.07'	98		
9	Spar 3	2' dia. x 20'	41°12.6'	70°38.05'	98		
10	Spar 4	2' dia. x 20'	41°12.6'	70°38.03'	98		
11	Spar 5	2' dia. x 20'	41°12.6'	70°38.01'	98		
12	Spar 6	2' dia. x 20'	41°12.6'	70°37.99'	98		
13	Spar 7	2' dia. x 20'	41°12.6'	70°37.97'	98		
14	Spar 8	2' dia. x 20'	41°12.6'	70°37.95'	98		
15	Spar 9	2' dia. x 20'	41°12.6'	70°37.93'	98		
16	Spar 10	2' dia. x 20'	41°12.6'	70°37.91'	98		
17	Buoy AW	30" inflatable	41°12.25'	70°39.67'	98	250	175' Synthetic
18	Buoy AM	30" inflatable	41°12.25'	70°38'	99	250	175' Synthetic
19	Buoy AE	30" inflatable	41°12.25'	70°36.33'	100	250	175' Synthetic
20	Buoy BW	30" inflatable	41°12'	70°39.67'	98	250	175' Synthetic
21	Buoy BM	30" inflatable	41°12'	70°38'	99	250	175' Synthetic
22	Buoy BE	30" inflatable	41°12'	70°36.33'	100	250	175' Synthetic
23	Buoy CW	30" inflatable	41°11.75'	70°39.67'	98	250	175' Synthetic
24	Buoy CM	30" inflatable	41°11.75'	70°38'	99	250	175' Synthetic
25	Buoy CE	30" inflatable	41°11.75'	70°36.33'	101	250	175' Synthetic
26	Buoy DW	30" inflatable	41°11.50'	70°39.67'	98	250	175' Synthetic
27	Buoy DM	30" inflatable	41°11.50'	70°38'	99	250	175' Synthetic
28	Buoy DE	30" inflatable	41°11.50'	70°36.33'	101	250	175' Synthetic
29	Buoy EW	30" inflatable	41°11.25'	70°39.67'	98	250	175' Synthetic
30	Buoy EM	30" inflatable	41°11.25'	70°38'	100	250	175' Synthetic
31	Buoy EE	30" inflatable	41°11.25'	70°36.33'	102	250	175' Synthetic
32	Buoy FW	30" inflatable	41°11'	70°39.67'	99	250	175' Synthetic
33	Buoy FM	30" inflatable	41°11'	70°38'	101	250	175' Synthetic
34	Buoy FE	30" inflatable	41°11'	70°36.33'	102	250	175' Synthetic
35	Buoy GW	30" inflatable	41°10.75'	70°39.67'	99	250	175' Synthetic
36	Buoy GM	30" inflatable	41°10.75'	70°38'	101	250	175' Synthetic
37	Buoy GE	30" inflatable	41°10.75'	70°36.33'	103	250	175' Synthetic
38	Buoy HW	30" inflatable	41°10.50'	70°39.67'	99	250	175' Synthetic
39	Buoy HM	30" inflatable	41°10.50'	70°38'	101	250	175' Synthetic
40	Buoy HE	30" inflatable	41°10.50'	70°36.33'	103	250	175' Synthetic
41	Buoy IW	30" inflatable	41°10.25'	70°39.67'	100	250	175' Synthetic
42	Buoy IM	30" inflatable	41°10.25'	70°38'	102	250	175' Synthetic
43	Buoy IE	30" inflatable	41°10.25'	70°36.33'	104	250	175' Synthetic

COONAMESSETT FARM
277 Hatchville Road
East Falmouth, MA 02536
508-564-5516
FAX 508-564-5073

September 12, 1995

Mr. Doug Marshall
New England Fishery Management Council
5 Broadway
Saugus, MA 01906

Dear Doug,

I am writing this letter to urge the Council to move forward with the Westport Scallop Enhancement Project. We should not lose site of the fact that this is a research project, of short duration, not a long-term request for an aquaculture lease. Moving forward with this project will provide many answers to questions regarding policy problems that at this stage are speculative. Time is extremely critical as the project has been tentatively funded by NMFS (S-K program) with a project start date for November 1995. All other permits are in place.

I request that the Council vote to have the Council staff and project proponents complete preparation of the public hearing document and plan amendment and present these to the Council for approval. Cliff Goudey (MIT Sea Grant) and Peter Shelley (Conservation Law Foundation) have submitted the draft amendment to the Council staff several months ago.

Once the Council approves the amendment and public hearing document we can move forward to the public hearing phase to determine from public review if there are real problems associated with the choice of the proposed site. Just proceeding with this process will help the Council decide what framework measures would be appropriate to allow research projects of this nature to take place.

I would like to also point out that the project proposal, per the Council's request, contains funding to include some of the existing site users into the project. Only a public hearing can provide information to finalize the site location.

Respectfully submitted,

Ronald Smolowitz
Fisheries Engineer/Farmer

New England Fishery Management Council
5 Broadway · Saugus, Massachusetts 01906-1097
TEL (617) 231-0422 · FTS 565-8457
FAX (617) 565-8937 · FTS 565-8937

Chairman
Joseph M. Brancaleone

Executive Director
Douglas G. Marshall

MEMORANDUM

DATE: September 26, 1994

TO: Sea Scallop O/S Committee & Advisors

FROM: Douglas G. Marshall, Executive Director

SUBJECT: October 12 and 13, 1994 meetings

Scallop meetings:

Wednesday, October 12, 1994 - Industry Advisory Committee meeting

Thursday, October 13, 1994 - Scallop Oversight Committee meeting

Both meetings will have the same agenda and begin at 9:30 AM at the E. Boston Ramada Inn (225 McClellan Highway, off Route 1A, (617) 569-5250).

Agenda

9:30 am	Extension of 7-man crew rule (what information is needed to make this decision?)
10:30	Area closures to protect small scallops (a staff report will be available at the meeting)
12:00	Experimental closure (presentation by Cliff Goudy; material handed out at September 21 Council meeting)
12:30 pm	Lunch
1:30	Economic viability of the scallop fleet: options already mentioned by the Committee include buy-backs (private and federal), selling DAS, banking DAS, and ITQ's
3:30	Comparative effects of ring size: a preliminary report on the sea trials being conducted by Kirkley/DePaul may be available with respect to the increase from 3-1/4 to 3-1/2 inches
4:30	Other business
5:00	Adjourn

cc: Interested Parties
Other Council Members
PDT Members

COONAMESSETT FARM
277 Hatchville Road
East Falmouth, MA 02536
508-564-5516
FAX 508-564-5073

September 29, 1994

Ms. Joan Palmer
Chief,
National Marine Fisheries Service
Woods Hole, MA 02543

Dear Joan,

Thank you for your offer to provide the fisheries data that my client, Westport Scalloping Corporation, needs to provide back to NMFS and the Corps of Engineers. Westport Scalloping Corporation has requested an exclusive zone to experiment with scallop growing approximately 6 miles south of Martha's Vineyard (see attached chart). We need to know what fisheries take place at this site and have taken place there in the last ten years. I realize your data base is not that site specific, but will greatly appreciate the best data available on catch from that area. We will be making a presentation to the Council scallop committee on October 13, 1994 and I am sure they will want to know this information. Thank you in advance for your help.

Sincerely,

Ronald Smolowitz
Fisheries Engineer

BARNEY FRANK
4TH DISTRICT, MASSACHUSETTS

2404 RAYBURN BUILDING
WASHINGTON, DC 20515-2104
(202) 225-5931

29 CRAFTS STREET
NEWTON, MA 02158
(617) 332-3920

Congress of the United States
House of Representatives
Washington, DC

558 PLEASANT STREET
ROOM 309
NEW BEDFORD, MA 02740
(508) 999-6462

222 MILLIKEN PLACE
THIRD FLOOR
FALL RIVER, MA 027[illegible]
(508) 674-355[illegible]

89 MAIN STREET
BRIDGEWATER, MA 02324
(508) 697-9403

October 3, 1994

Rolland Schmitten, Administrator
National Marine Fisheries Service
Room 14555, SSMC-3
Silver Spring, MD 20910

Dear Mr. Schmitten:

I am writing in support of the Westport Fishing Corporation of New Bedford, MA's application to the Northeast Fishing Industry Grant program to develop a sea scallop aquaculture process. The Westport proposal aims to create a restoration and sustainable harvesting plan for sea scallops that will benefit the industry as a whole and the resource in particular.

With the NMFS support, the Westport Fishing Corporation will refer to scallop processes developed in Japan, Peru and Canada to implement an aquaculture program best suited to the region and species for cultivation. The Westport program will utilize the existing scallop infrastructure to research the technology needed to culture scallops away from hazards along the coastal zone. Samples will be taken from bycatch, and studies will be conducted to compare preferred site selections for the grow-out process; off-bottom culture (arrays) versus bottom culture (lanes).

The primary objective of the Westport proposal is to introduce scallop husbandry to fishing fleets in urgent need of innovative methods of production. As you know, the scallop industry and population facing challenging times. By developing an efficient scallop grow-out process, the industry will gain a viable alternative to wild harvesting and the resource will benefit from a reprieve from conventional methods thus revitalizing the stock.

I urge your support for the Westport Fishing Corporation application for an NFIG grant.

Sincerely,

Barney Frank

BARNEY FRANK
Member of Congress

BF/sr

New England Fishery Management Council
5 Broadway, Saugus, Massachusetts 01906-1097
Telephone 617/231-0422 • Fax 617/565-8937

New England Fishery Management Council Meeting Agenda

October 26 and 27, 1994
King's Grant Inn, Route 128 and Trask Lane
Danvers, Massachusetts 01923 508/774-6800

Wednesday, October 26

10:00 a.m. **Introductions and Announcements**

10:10 **Sea Scallop Committee Report** (Thomas Hill) - *request to conduct a sea scallop enhancement project in the EEZ; review of consolidation alternatives; whether to maintain the 7-person crew limit rule; discussion of area closures to protect small scallops; results of the most recent Kirkley/DuPaul ring-selectivity study

11:30 p.m. **Groundfish Committee Update** (Philip Coates) - biological targets and timetables to address declines of key groundfish stocks; discussion of potential interim actions to address resource conditions

noon **Lunch**

1:30 **Groundfish** - continued

4:00 **Monkfish Committee Report** (James McCauley) - progress on the development of a fishery management plan

4:30 **Reports on Recent Activities** - Council Chairman, Executive Director, National Marine Fisheries Service Regional Director, Northeast Fisheries Science Center, U.S. Coast Guard and Mid-Atlantic Council Liaison

Thursday, October 27

8:30 a.m. **Reports - continued**

9:30 **U.S. State Department** (Stetson Tinkham) - policies affecting high seas fishing activities

10:30 **Lobster Update** (Eric Smith) - **final action on Framework #1 - addition of criteria to qualify for a limited access permit (applicants holding federally-endorsed state lobster permits must show proof of vessel ownership and associated lobster landings as of March 25, 1991); ** initial action on Framework #2 - preliminary discussion of other qualifications for limited access permits

noon **Lunch**

1:30 p.m. **Lobster** - continued

2:30 **Interspecies Committee Report** (Barry Gibson) - **final action on framework adjustments to the Groundfish, Scallop and Lobster Plans to allow permit renewals based on fishing histories if the applicant does not own a boat at the time of application; **initial action on a framework adjustment to exempt vessels from a permit splitting prohibition if boats were acquired prior to the implementation of Amendment #5 to the Groundfish Plan.

4:30 **Other Business** (Joseph Brancaleone)

The above agenda items are subject to change as necessary • This meeting is physically accessible to people with disabilities.

Sea Scallop Enhancement Project

*The Westport Scalloping Corporation requests that the New England Fishery Management Council close a nine by nine square mile site south of Martha's Vineyard to commercial fishing operations for eighteen months. The applicant proposes to conduct a sea scallop enhancement project and will address the Council on Wednesday, October 26, 1994. The NEFMC intends to make a final decision at this meeting. The public is encouraged to comment. Written copies of the proposal are available through the Council office prior to the meeting.

Framework Adjustments to Fishery Management Plans

**The Council will consider public comments at a minimum of two Council meetings before making recommendations to the NMFS Regional Director on any framework adjustments to fishery management plans. If the Regional Director concurs with the measures proposed by the Council, he has the discretion to publish them as a final rule.

New England Fishery Management Council
5 Broadway
Saugus, Massachusetts 01906-1097

New England Fishery Management Council
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FAX (617) 565-8937 · FTS 565-8937

Chairman
Joseph M. Brancaleone

Executive Director
Douglas G. Marshall

MEMORANDUM

DATE: November 15, 1994

TO: Interspecies Committee Members

FROM: Douglas G. Marshall, Executive Director

SUBJECT: November 30, 1994 Committee Meeting

Chairman Gibson has scheduled an Interspecies Committee meeting on November 30, 1994 at 9:30 a.m. The meeting will be held at the Holiday Inn, Peabody MA. The committee will discuss the following items:

- The practicability, application and Council involvement in using special management areas to deal with proposals such as the sea scallop enhancement project south of Martha's Vineyard and salmon aquaculture in the Gulf of Maine. The committee may make specific recommendations with respect to these proposals.

- The ability of various fisheries to absorb effort that would be re-directed as a result of the decline in groundfish stocks and possible management actions.

The Travel Authorization number is 95-36. An agenda will be distributed at a later time. Other discussion items may be added. Directions are on the reverse side.

This meeting is physically accessible to people with disabilities.

cc: Council members
Interested parties

Location

The hotel is located at the junction of Routes 1 & 128 on Rt. 1 North. From Rt. 128 North, use Exit 44 A. From Rt. 128 South, use Exit 44. Follow Food & Lodging signs. Approximately 20 minutes from downtown Boston and Logan Airport. Amtrak and Trailways stations are 16 miles. Greyhound Station, 4 miles.

New England Fishery Management Council
5 Broadway • Saugus, Massachusetts 01906-1097
TEL (617) 231-0422 • FTS 8-617-565-8457
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Chairman
Joseph M. Brancaleone

Executive Director
Douglas G. Marshall

*** Public Hearing Notice ***

New England Fishery Management Council Public Hearing

on a proposal to establish a 9 square-mile site located 10 miles south of Martha's Vineyard for the purpose of conducting an 18-month experiment and demonstration project involving sea scallop research and aquaculture

January 19, 1996 at 1:30 p.m.
Redfield Building and Auditorium
Woods Hole Oceanographic Institution
45 Water Street
Woods Hole, Massachusetts
(for information about public parking, please call the Council office)

Fishermen and any other interested members of the public are encouraged to attend and discuss a proposal to establish a temporary experimental use area in federal waters approximately ten miles south of Martha's Vineyard. Otter trawling, mid-water trawling and the use of other mobile gear, shellfish dredging and gillnetting would be prohibited. Other fishing activities such as lobster trapping, pot fishing, pole fishing, jigging and longlining would be restricted but allowed within the nine-square mile site.

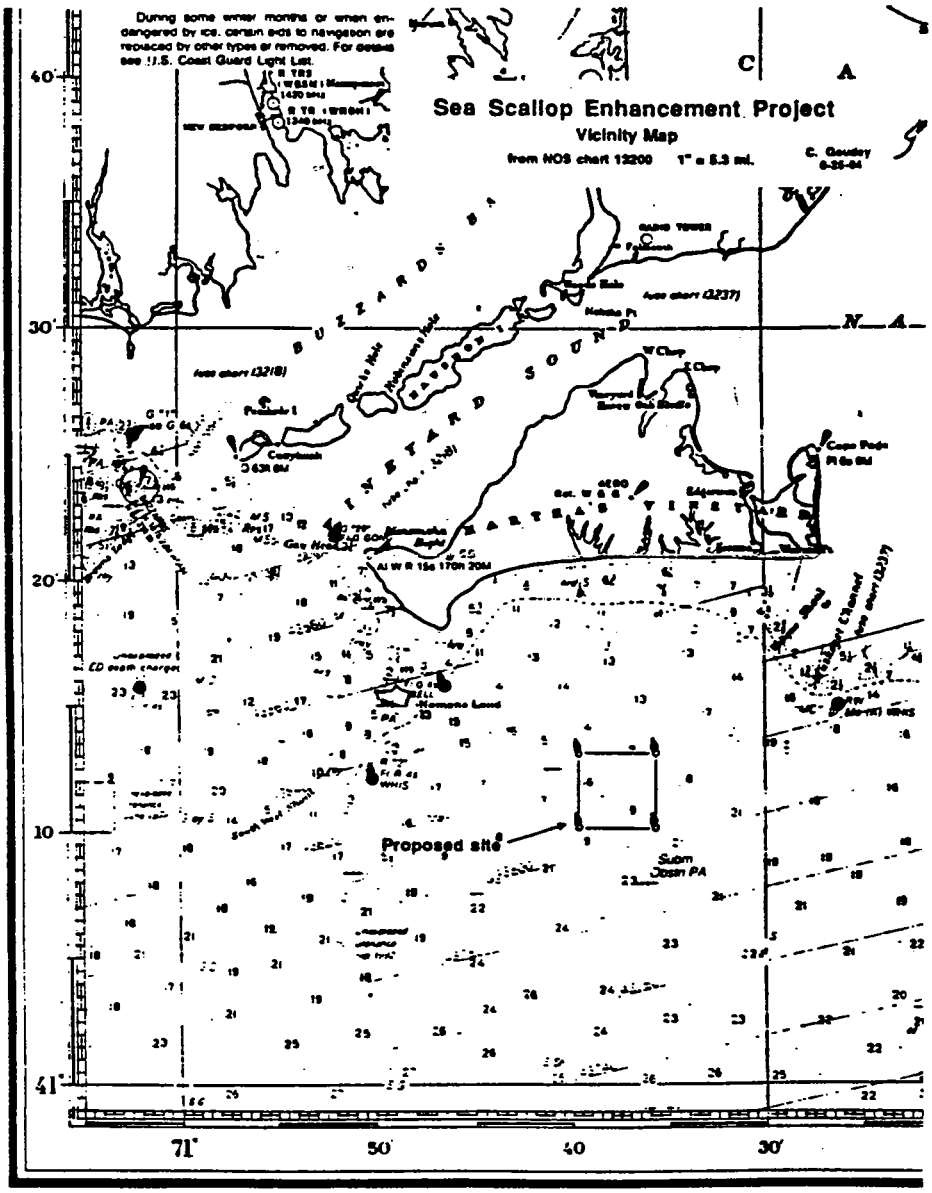
During the 18-month long project the area would be used to determine the feasibility of the enhancement of wild stocks through bottom seeding, the study of harvest gear/scallop/habitat interactions, open ocean pen engineering and the growth rates of transferred juvenile brood stock in both pen culture and open bottom culture.

This issue will be on the agenda at the New England Fishery Management Council's January 24 and 25, 1996 meeting at the King's Grant Inn in Danvers, Massachusetts. There will be additional opportunities for public comment at that time. The Council also will accept written comments until January 30, 1996.

If the project is approved by the Council, an amendment to the Council's Sea Scallop Fishery Management Plan will be submitted to the Secretary of Commerce. If accepted, notice of the amendment will be published in the *Federal Register* as a proposed rule with an accompanying comment period.

Copies of the proposal will be available at the hearing, but may be obtained in advance by calling or writing the Council office. Please send written comments to Mr. Douglas G. Marshall, Executive Director, New England Fishery Management Council, 5 Broadway, Saugus, MA 01906. Telephone 617/231-0422.

This meeting is physically accessible to people with disabilities. Requests for sign language interpretation or other auxiliary aids should be directed to the Council office at least 5 days prior to the hearing.



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5 Broadway
Saugus, MA 01906

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RON SMOLOWITZ
COONAMESSETT FARM
277 HATCHVILLE RD
EAST FALMOUTH MA 02536 4009

ATLANTIC SEA SCALLOP FISHERY MANAGEMENT PLAN

NEW ENGLAND FISHERY MANAGEMENT COUNCIL

AMENDMENT #6 DRAFT

WESTPORT SCALLOP ENHANCEMENT PROPOSAL

SUMMARY MINUTES

Phil Coates: Welcomes everyone to the public hearing and asks them to sign in and pick up a copy of the document.

The proposal would establish a nine-square mile experimental operation to enhance the productivity or culture of Atlantic sea scallops, in federal waters 10 miles south of Martha's Vineyard.

Public comments are excepted until next week. The Scallop Committee is on the agenda of the Council meeting, January 25, and we ususally approach these things with a spirit of approval. Your comments today are germane to that decision.

We chose this site for the public hearing because it's closest to the fishermen potentially impacted by the closed area, from Martha's Vineyard and New Bedford.

Introduces Cliff Goudey and Ron Smolowitz.

Cliff Goudey: There has been a lack of information from people using the proposed area. This is a very controversial subject and we want to respect everyone's interest. The (enhancement) concept applies to the entire fishing industry.

We have presented an aquaculture proposal, in general, to the Council several times. Today we want to elicit comment on why we picked this particular site and what the plans are.

Cliff reiterates the factors in the selection of the experimental area location (page 4 of the attached document). This is a nine-square mile site, and a good cross-section of the oceanographic processes out there. We have examined the NMFS fishery data and this is not a hot-spot for scallops, which would be unsuitable for this experiment. This has not been a

normally productive area for sea scallops, but it is suitable for grow-out. We attempted to be complete in talking to mobile gear fishermen, and this does not appear to be a very productive fish area either.

Cliff describes the general array/lane set-up (see Figure 2), the suspended array (Figures 3&4), and the bottom grow-out cage (Figure 5). We expect a great number of the seeded scallops to be harvested.

The activities restricted in the project area include Allowed, Controlled, and Prohibited Activities (page 9). There are two vessels definitely participating, and several other large scallop vessels in the works. The accounting plan for DAS is designed to prevent double-counting of the days (page 10), and includes two extra DAS each year for participating vessels. Collection of juvenile and small scallops and at-sea transfer of scallops will also occur. There will be a free dissemination of the results of the project.

Cliff mentions all of the people involved in the project. He asks for comments.

Phil Coates: The Council has the jurisdiction over the handling and processes of culturing sea scallops. References 50 CFR 650.29. A full plan amendment takes as long as ten months to several years.

Jonathan Mayhew: Over a year ago, the Town of Chilmark was opposed, not to the concept, but to the location of the project (refers to the "factors for selection", page 4 of the document). You've never come to Menemsha to explain why this location is better than any other location. I will speak for the mobile gear fishermen, as well as the lobstermen. I take exception to most of these points. The fishery data are highly inaccurate. With respect to number 6; it is productive for fish and lobsters, for mobile gear, gillnets, tub trawls and jiggers. It is the closest area for small draggers (from New Bedford) to fish, especially in the winter.

Number 7, surface traffic; it is in a direct line from the green buoy at Noman's to the corner buoy at the south end of Nantucket shoals. The surface traffic in this area is heavy, particularly at night in the summer. You'll see 15 to 20, sometimes 30 to 40, boats pouring through there. Number 8, water temperature; no problem with water temperature.

Number 9, non-commercial quantities; it is a non-productive area as

you say. You're spreading an industry to an area where it is non-traditional. Lobstermen have had problems with mobile scallop dredgers who are in there for mostly lobsters and some scallops, and wreak havoc. Therefore, has an Environmental Impact Statement on the effects of dredgers in this specific area been done? There are sponges, or monkey dung, that provides a habitat for lobsters in that area.

Cliff Goudey; No, there have been enough tows in there to suggest that the impact has already been felt. Rodney Avila, the most vocal opponent on the Council, has argued that it is a prime towing area for New Bedford draggers.

Jonathan Mayhew: That's draggers not scallop dredgers. If you move that site, as we suggested in the past, somewhere around the southwest of Cox's (ledge), there's an area that's virtually never dragged because the bottom is hard. You'd still have the lobster issue to argue. You couldn't have picked a more active mobile gear area close to the beach in the winter. There are areas more to the westward that are more traditional sea scallop areas. Why did you not address the Town of Chilmark's opposition? Now you're introducing scallop dredgers into a heavy lobstering area.

Cliff Goudey: The area is capable of supporting scallops.

Jonathan Mayhew: I've tried scallopping in that area and I've never found any scallops there in commercial amounts.

Ron Smolowicz: This project is part of a process to significantly increase the production of scallops in our waters. Sea scallops is an industry that can be framed in terms of billions of dollars in aquaculture. There are many areas off Massachusetts suitable for sea scallops that are not commercially productive. This is a suitable area for scallop growth, but the scallops probably do not live past the first or second year of life in this particular area. That's one of the purposes of the experiment, to document the reasons why. The 10 minute-square data shows south of this area produces an order of magnitude more dollars in findish and scallops.

Jonathan Mayhew: That data is inaccurate; the areas (10 minute-square) are very big.

Jeff Clements, lobsterman from the Oak Bluffs:

I agree with Mr. Mayhew that it's a fragile area. That's more the reason why we should get into the ... program. It's traditionally an area that does grow sea scallops. We can't leave everything alone, lets try something new. It's an industry within an industry.

Phil Coates: The document, on pages 19 through 24, indicates that the Environmental Assesssment is sufficient for the impacts of this project. Reads the questions on page 24.

Mike Pecciandra, Edgartown: I've counted over 40 boats on a given day in this area. The data do not indicate commercial activity and that's wrong.

John Larson, Edgartown: I've fished in that area, and land 60% of my gross income from there, mostly to the west of there. Eighty percent of my income is from lobstering. I've fished in that area for 15 years, and unless the state's giving them my catch reports I don't think they know what I caught. When they ask what we caught in those areas they're pretty vague; it's a big area. There's an inshore area and an offshore area, and landings could be from 20 miles to the west. I got a lot of trouble with scallopers making shack tows in this area, and now you're bringing them into the area. One night I lost 103 pots, which may not seem like a lot to you but I'm a one man boat. Most Vineyard fishermen are one man boats, and we depend greatly on that area. Only trouble is in the fall when the lobsters are thick and the scallopers stop for their shack tows. Jeff fishes on the north shore, it doesn't make any difference to him. How are you going to harvest the stuff with all the monkey dung. As far as controls, what controls are you going to put on me? I'm not going to move my gear out of there. I would've taken Ron out and show him where we fish. Mr. Goudey said a good experiment is a quick clean up; how do you expect a quick clean up when the scallops spread out? You're introducing scallops in a prime lobster area and I'm opposed to it.

Mark Simonitsch: I'd like to add a little to John. Cod fish have tails and they move. If you set your hooks at the right time, cod fish are moving right through that area. If you go privitizing that area, there's no way I'm going to be able to set longlines with your buoys and your cages. You're depriving me, and anyone working with me, from

making a living in this area.

Cliff Goudey: There is a lot of concern with increased scalloping in this area. However, lobstering may continue, longlining may continue, jig boats may continue. We do not want to affect the balance of use in this area. Bureaucratic inertia may prevent us from moving the area anywhere. This is the process (today's meeting) to deal with these kind of concerns. Monitoring will be done by the scientists, including MBL. Is the problem with the timing of harvesting, when the lobsters are thick? These are the types of questions we want to answer. These kinds of fisheries may coexist by control. We have to know who's gear is where so we can conduct the experiment.

Phil Coates: Up in the back. I want to hear a variety of comments.

Norman Vine: I'm a commercial draggerman with 15 years experience in that area. The project is to benefit the scallop industry. Why pick an area without scallops? Why not pick scallop bottom and not dragger bottom.

Debra Colombo: Where is the hard bottom you're talking about. Is there another way, other than all the paperwork, to change the location of it? You'd probably have less crab predation, which is a problem. And then you don't have to deal with small draggers. Draggers anywhere there's lobsters and you're ripping up the bottom and damaging the lobsters. Wait until winter when the lobsters move offshore to drag and harvest the sea scallops. If its that much of a better idea (to move the area) and that much less controversial, then it might be worth it.

Phil Coates: I'd ask you, Jon, is there such an area?

Jonathan Mayhew: Go to an area 15-18 miles west, the southwest edge of Cox's, to solve the mobile gear fishermen's problem. Lobstermen are still worried about any 14-15 foot scallop dredges, because that gear can roll lobster gear up into a ball which a dragger cannot do. This also drives the lobsters away from the area.

Mike Pecciandra: Mr. Goudey has mentioned the process that you have to go through. I, as a commercial fishermen of 20 years, didn't find out about this area until now. You should query the fishermen as to where they fish. Most fishermen who fish that area are not here

because you had a little tiny blurb in the paper. If you sent out notice to every fisherman with a state permit and a federal permit, you'd find out that there's hundreds of fishermen who have and do fish in that area. I'm all for aquaculture, but not where I catch fish.

Phil Coates: I think I've heard that before. Someone else tried to start salmon-farming off Rockport, but failed because of the interminable process for approval. This is the Council's first try at this type of project. I don't know what the implications are of moving the project one 10 minute-square to the east, but it wouldn't be as problematic for the Council as perhaps some other agencies. We're going to see greater interest in increasing the productivity out there.

Cliff Goudey: This is not a commercial project. This has been a long process, and this part of it is asking you. If we asked every fisherman, 80% would say that they fished here. The Council is one part the process and we're here now.

Mike Pecciandra: We cannot move from this area. Why do you insist on using a traditional fishing area?

Other fisherman: Why don't you find a traditional scallop area?

Harlyn Halvorson: We're interested in this project because in contrast to adding feed to the water and deal with waste management, this one deals with .. already in the water column. This project is highly deserving of being looked at for national ..

Bill Adler: Mass. Lobster Association is concerned with this project. First, the controlled aspects on lobstermen may be problematic, because it will restrict their activity. The outside of the area is not a hot-spot now, but it may become one. Also, the interaction of lobster gear and your gear may be a problem, getting tangled up. Another thing, is there any gaurantee that this temporary project may become permanent? What do lobstermen have to do to make you adjust your operation? There is no recourse for lobstermen. It should be that you use the area if you don't interfere with them, not vice versa.

Dave ...: I'm a commercial fisherman and an aquaculturist. No matter where Ron goes with that thing he'll be on somebody's toes. I'm having the same problem in Provincetown. This is just a peeing contest: draggermen are

environmental terrorists, lobstermen smother the bottom. However, we are doing this too and we are creating habitat. The scallop product from this type of project is real good. We need to experiment. It looks like a big area on that chart, but it really is not. We had better get going with aquaculture. We're so far behind the rest of the world that it's insulting.

Scott Stevens: I'm a lobsterman who fishes that area. I'm against the attraction of other sea scallopers. We need a buffer area around that area.

Phil Coates: There is a quarter mile buffer zone. Now, you'd like an additional buffer area?

Jonathan Mayhew: You want this to succeed. If it does there'll be a lot of scallops in that area. The problem is that lobstering and scallopping do not mix. Interactions are now occasional, but devestating. Lobstermen like the project but not the location. The most important thing is the right spot. It should be 10 miles more offshore, and westward. This is the outer limit of where inshore lobstermen go during summer. You're asking lobstermen to give up a hell of a lot. There's much more impact on lobstermen than the mobile gear fishermen.

Mark Simonitsch: These are comments I picked up listening to fishermen (in Chatam). I hope that the Council approves and assists this project. You will gain experience and insight to determine the role the Council will play in the future of aquaculture. Today, I hear fishermen from the Vineyard saying that 40-50, well maybe really 20-30, boats work that area. Have an informal strategy for these groups, the experiment and the lobstermen, to work out for 18 months. This process takes place continuously in the Council, and then the public gets a chance to comment after the fact at this formal presentation. This is a serious short coming of the Council. I like to second Bill Adler and Jon Mayhew.

Ron Smolowicz: I went to the Vineyard and fishermen wanted to move the area to Cox's ledge, or somewhere else. But whenever we mentioned somewhere else, other people fish there. That's why we're using this public hearing process. We have to look at this as the entire fishing industry. National Sea in Canada has set up a scallop hatchery, has 150 acre site offshore, and plans to produce one million pounds of scallop meats from it. Our scallop industry is down to less than 20 million pounds in a 72,000 square mile range with scallop dredges. This project may introduce other ways to

harvest scallops than dredging, and build cooperation between lobstermen and scallopers.

Fisherman next to Jon Mayhew: Most lobstermen where gone, because the weather was good, when you came to the Vineyard.

Mike Pecciandra: I've been trying to get an aquaculture license on the Vineyard. No one knows, nor asks, where the fishermen fish. Shame on us for not taking advantage of bay scallop aquaculture, which we gave to the Chinese. They now import 300 million pounds to the U.S. It's not just the Vineyard fishermen who fish there (in the proposed area), I've seen Gloucester and New Bedford boats there. Very little of the bottom is productive. Have you asked the mahogeny quahog people about your farm? I'm sure you haven't.

Roger Putnam: I'm with the Wellfleet Shellfish Commission. There is a growing demand for licenses offshore. What are the regulations that'll apply to this area. We're interested in this process and how it affects the town.

Phil Coates: This is in the federal zone. Inshore and wetlands regulations shouldn't apply, but the process may be of interest to the towns.

Slater Anderson: The fishery isn't just the fishermen. We need to augment seafood production. There are always conflicts, inshore and offshore. We need to have the project.

Tom Bosworth? (white hat in back) I'm trying to become a shellfish farmer, around New Bedford. Nothing gets done with the 'I was here first' attitude.

Jon Mayhew: There's not a fisherman opposed to the project, it's just the location. Not just the 'Not in my backyard' (NIMBY) attitude. A move offshore will result in less interaction. Inshore lobstermen have a bad taste in there mouth with a few experiences with large offshore scallopers. This (proposed) area happens to be at the edge of hard and smooth bottom. Also, it's a good codfish area for small and large draggermen. There's yellowtail there, in certain years. The problem is your presupposition that any area is bad for fishermen. This area is a bad location. Just find an area that shows it can grow scallops and won't create a lot of hard feelings like this one will. Some fishermen will hope the project fails because of the location.

Norman Vine: This is not a good scallop area. Just by depth alone, what does it average about 10 fathoms? Commercial scallopers will tell you scallops don't come from depths that shallow. Maybe ten miles more offshore is better.

Peter Watson: Cape Cod & Islands Farm Bureau board of directors voted unanimously to support this project and aquaculture (see letter). NIMBY applies ten miles to east or west. Once this operation gets running and proves itself these lobstermen will feel better.

Bill Adler: Council should approve the concept of a series of meetings with the fishermen involved, and another location.

Ron Smolowicz: I agree with Norm that if we moved the area 10 miles south we would have a better chance of success. But a big bulk of the industry is going to disagree with that. This (meeting) is the public process. We have no authority as researchers to go around and have public hearings. We did a lot of looking around for the correct set of parameters (for the site), trying to minimize the impact on fishermen. If we don't go forward with this experiment now just because of the location, we'll end up at another meeting like this with more people telling us that we are in the wrong area. Let's just do it, working together.

Jon Mayhew: Where? I'm the one who fishes there. I'm the expert on who fishes in that area. Move it ten miles to the south, then there's no inshore lobstermen, tub trawlers, or gillnetters. Just a New Bedford draggermen who can work around it. The proposed area is on a major edge of a major tow. I promise you you're not moving into someone's backyard, it's our backyard.

Norman Vine: I'll second that. Moving ten miles south will result in ten percent of the opposition you're getting now.

Cliff Goudey: One consideration we neglected to list (on page 4) is the ability to scuba dive into the area. That requires about a 120 foot depth limit. A process needs to be established to come to the best situation we can. This is public land. The best we can do is to place it in most peoples' interests. I'd hate to see this project become a sore spot on what aquaculture can be. Maybe you guys should be the ones involved in running this project (in terms of fishery interactions). The end of the experiment is the critical time, when we don't have control over the area.

John Larson: If you could slide it to the southward ten miles,that would be in our interest and there would not be any problem.

Mark Simonitsch: I've been trying to get grants to Nantucket Sound for years. My problem was that there was nothing there, but there was potential for something to be there. That resulted in a 'No' answer. The success of every proposal will depend on the willingness of the people who use, or will use, the area to work together. You've done this yourselves informally, with the (Vineyard) draggers and the lobstermen.

Jo-Ann Taylor: Martha's Vineyard Commission feels that aquaculture is important to our future. We also support traditional fisheries, and the culture of our fishing communities. Aquaculture should be on sites where no fishing activity takes place. Codfish catch on page 15 (table 1), for both the 3 minute-square and New England, has steadily increased since 1985. That's not true for New England and especially for the Cape. That data must be wrong. Fishermen should not be shut out.

Debra Colombo: There is an area of traditional lobster ground, highly productive for 100 years (in Maine). The university and the lobstermen community got together using under-water cameras. They got all the lobstermen to pull their traps. The lobsters took off and left. Those lobster pots were working as a nursery. The lobsters followed the pots around! Lets work together, the lobstermen and the project, in a similar fashion.

Phil Coates: How many lobstermen and pots in this area?

Mark Simonitsch: Five men and 1500 pots.

Mike Pecciandra: It's not just lobstermen in there, too, it's good cod fishing grounds. Must be a mechanism in this process to query other user groups. The user groups should be able to work together. For instance, yatchtsmen's ability to tack off of Woods Hole prevented another aquaculture project. There's only four of us here, but I know there are more fishermen of this area. Some of the fishermen I've seen in that area may be from Gloucester or Westport. The (fish) farmer doesn't know where to go, because the fishermen haven't been asked where they go. Fishermen don't want to tell where they catch fish. State and federal license information should show location of tows or pots on a chart.

Judy Dutra: I'm part of the Truro aquaculture project. I understand the opposition to taking traditional lobster or fish area. The basis of agreement is compromise. In Truro, we had to compromise and consider the whale issue. We had to move the area. The experiment is only for 18 months; they should just be allowed to do it.

Andy Baler: This is a different gear conflict issue. I don't understand the problem with lobster gear which can be set within the area. During the project, lobster gear can co-exist with aquaculture. Lobstermen may be worried about the end of the project when more scallopers will come into the area. Mobile trawl gear will be the ones shut out. This is a fantastic project and should go through. We must take advantage of this precedent.

Phil Coates: The concentration of scallops may spill out into adjacent areas and attract other scallopers. Other issues may be the disruption of activities during sampling, and the post-experiment harvesting. But I think that these can be accomodated. I don't know if there are any other concerns.

Mark Simonitsch: We've had trouble in the past with scallopers dredging through occasionally. And what happens when the scallops spread out, we're not there at night to protect our gear.

Jon Mayhew: As a mobile gear fishermen, I have no problem with the project other than the location. It is Chilmark's closest fishing area (six miles). If you move the area ten miles south, I will go back to the selectmen and ask for their endorsement of the site. The area will still be in our backyard, but not the inshore lobster fishery. I feel that this new fishery is incompatible with inshore lobstering. That will show that you did listen to the locals. To say that moving the area at all will blow out the whole process is baloney.

Mike Simonitsch: There used to be an awful lot of tub trawls and hook boats (15 to 20) out there, in January, February, March and April. I have fished in that area, but not ten miles south. I won't be able to set hooks in the project area. I can't set hooks on top of lobster gear. February through April is the traditional cod season in this area. Ten years ago there were many boats there, but not this year.

Phil Coates: The Council is scheduled to review this project next week. I think they'll look hard at these comments. The Council wants to move this project along. Bill Adler's concept may be useful to get some compromise. Everyone's in agreement with the concept of the project. The question is, is this a NIMBY situation or a real gear conflict? You have until January

30 to make written comments, but to be on the safe side you may want to get them to the Council by next Wednesday.

Closes the meeting.

University of Massachusetts
Dartmouth

North Dartmouth
Massachusetts 02747-2300

508
999-8000

UMass Dartmouth

Mr. Douglas Marshall
Executive Director
New England Fishery Management Council
5 Broadway
Sangus, MA 01906

January 19, 1996

Dear Mr. Marshall;

The Policy Center for Marine Biosciences and Technology (PCMBT) and the Sea Scallop Working Group in Massachusetts strongly urge the New England Fishery Management Council to approve the amendment for the sea scallop research project south of Marthas Vineyard. Offshore underwater production of sea scallops provides one of the best hopes for supporting aquaculture in Massachusetts. This approach avoids (1) "not in my back yard" issues that have limited this industry in our State and (2) concerns over waste management as these animals draw their feed from what is in the water column. We have extensively investigated offshore sea scallop aquaculture this past year with potential sea scallop farmers working with professional scientists, government managers, regulators, lawyers, environmentalists and economic development specialists. What is now need is a research project to demonstrate the feasibility of this industry in our waters.

PCMBT was formed as a national 'center without walls' in 1992 to address a broad range of problems and opportunities raised by recent developments in marine biosciences. Since its beginning PCMBT has been focusing on aquaculture and the marine environment. The Sea Scallop Working Group represents some 80 individuals from diverse organizations who have been meeting since December 1994 to explore critical issues, define possible options for action and to develop an industry-driven, bottom-up approach to sea scallop aquaculture. A Blueprint for Sea Scallop Aquaculture in Massachusetts was developed this fall which endorses the above project.

Sincerely,

Harlyn O. Halvorson

Harlyn O. Halvorson
Director PCMBT and Member Sea Scallop Working Group

CAPE COD AND ISLANDS FARM BUREAU

THE VOICE OF THE GREEN INDUSTRY

January 17, 1996

Mr. Douglas Marshall
Executive Director
New England Fishery Management Council
5 Broadway
Saugus, MA 01906

Re: Sea scallop research project south of Marthas Vineyard

Dear Mr. Marshall,

The Cape Cod and Islands Farm Bureau strongly urges the New England Fishery Management Council to approve the sea scallop research project amendment and take whatever other action is needed to support this project. The Farm Bureau has over 500 members on Cape Cod and the Islands of Marthas Vineyard, Nantucket, and Cuttyhunk. Many of our members are actively involved or are interested in the potential of aquaculture. Many of our small scale fishermen are also interested in the possibility of aquaculture offering an alternative or an enhancement opportunity to wild capture fisheries. It is about time that we start moving in this direction in southeastern New England. We have over 100 aquaculture operations on the Cape and Islands at present providing much needed jobs and revenue. However, this industry is constrained by other users and severe regulation in the crowded coastal zone. There is a need to look at the possibilities offshore. While there are many questions about private leasing and impact on other users, this experiment will serve to provide some much needed answers. Again, even with these concerns, the Board of Directors of the Cape Cod and Islands Farm Bureau unanimously endorse this project.

Sincerely,

Rob Crimmins
President
Cape Cod and Islands FB

New England Fishery Management Council
5 Broadway • Saugus, Massachusetts 01906-1097
TEL (617) 231-0422 • FTS 8-617-565-8457
FAX (617) 565-8937 • FTS 8-617-565-8937

Chairman
Joseph M. Brancaleone

Executive Director
Douglas G. Marshall

*** New England Fishery Management Council ***
Public Hearing Notice

May 17, 1996 at 1:00 p.m.
UMass Cranberry Experiment Station
Glen Charlie Road
Wareham, Massachusetts
Telephone 508/295-2212
(directions are available through the Council office or by calling the telephone number above)

The Council proposes to change the location of the sea scallop demonstration research and aquaculture project initially considered at a public hearing in January, 1996. After discussions with fishermen who use this site to harvest finfish, lobsters and scallops, project representatives have suggested a new location several miles south of Nomans Land to conduct the 18-month long experiment.

Fishermen and any other interested members of the public are encouraged to attend and discuss a proposal to establish a temporary experimental use area for sea scallops in federal waters approximately twelve miles southwest of Martha's Vineyard. Otter trawling, mid-water trawling and the use of other mobile gear, shellfish dredging and gillnetting would be prohibited in the designated area. Other gear types such as lobster traps, pots and longlines would be restricted but allowed within the nine-square mile site. Fishermen using handgear would not be restricted.

During the 18-month long project, the area would be used to determine the feasibility of enhancing wild stocks of scallops through bottom seeding, the study of gear type/scallop/habitat interactions, open ocean pen engineering and the growth rates of transferred juvenile brood stock in both pen culture and open bottom culture.

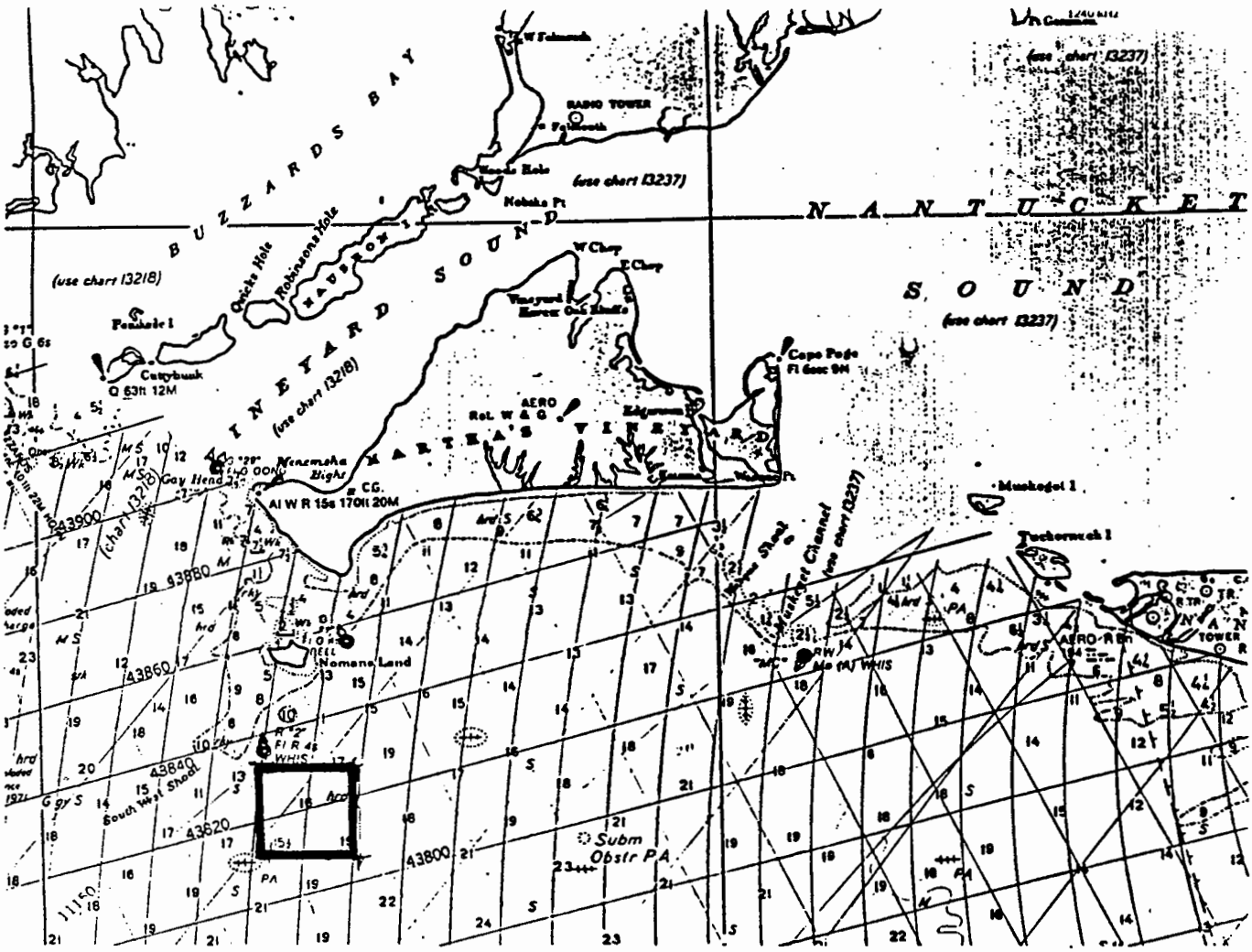
This issue will be on the agenda at the New England Fishery Management Council's June 5-6, 1996 meeting at the King's Grant Inn in Danvers, Massachusetts. There will be additional opportunities for public comment at that time. The Council also will accept written comments until June 4, 1996.

If the new location is approved by the Council, an amendment to the Sea Scallop Fishery Management Plan will be submitted to the Secretary of Commerce. If accepted, notice of the amendment will be published in the *Federal Register* as a proposed rule with an accompanying comment period.

Copies of the proposal will be available at the hearing, but may be obtained in advance by calling or writing the Council office. Please send written comments to Mr. Douglas G. Marshall, Executive Director, New England Fishery Management Council, 5 Broadway, Saugus, MA 01906. Telephone 617/231-0422.

This meeting is physically accessible to people with disabilities. Requests for sign language interpretation or other auxiliary aids should be directed to the Council office at least 5 days prior to the hearing.

Charge June



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Saugus, MA 01906

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TEL (617) 231-0422 • FTS 8-617-565-8457
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Chairman
Joseph M. Brancaleone

Executive Director
Douglas G. Marshall

MEMORANDUM

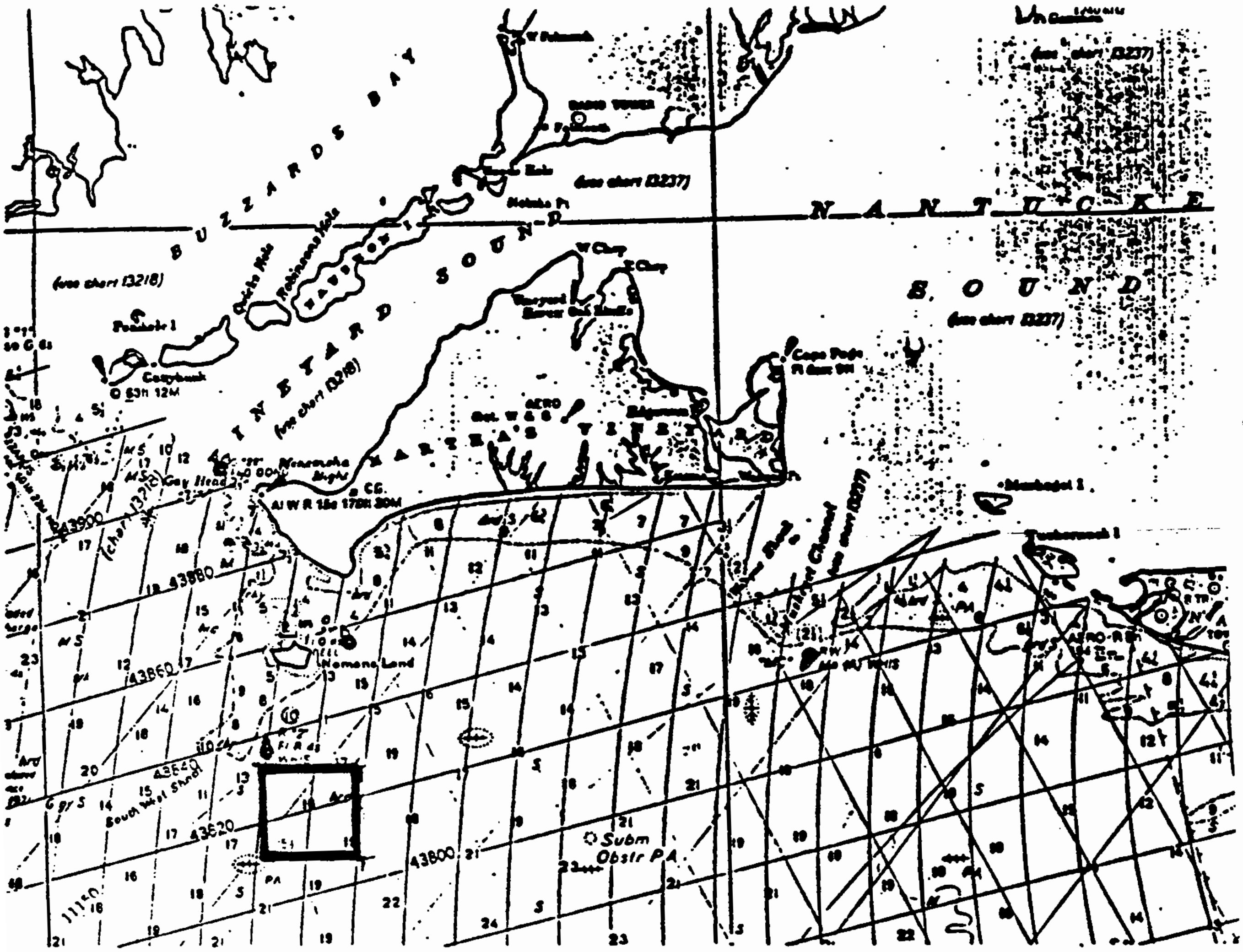
May 23, 1996

TO: Sea Scallop Committee
FROM: Council Staff
SUBJECT: Public Hearing Summary, Sea Scallop Experiment, Enhancement and Aquaculture Project, May 17, 1996

Shortly before the April Council meeting the proponents of the sea scallop project proposed for federal waters south of Martha's Vineyard notified the staff that members of the fishing community, including lobstermen, scallopers and trawl vessel operators had reached consensus on a new site for the project. All parties agreed that the alternative location, approximately 3 miles southwest of the original location, was preferable to the site initially proposed and included in Amendment 5 to the Sea Scallop Plan.

To accommodate this agreement the Council withdrew the amendment, which already had been submitted to the National Marine Fisheries Service (NMFS), and agreed to hold an additional hearing on May 17 to ensure that all interested parties had an opportunity to comment on the new site.

No opposition was voiced at the hearing and support was expressed by the William Adler, Executive Director of the Massachusetts Lobstermen's Association and Jon Larsen, a Martha's Vineyard lobsterman. A NMFS employee inquired about the proponent's intent to monitor possible habitat alterations by various gears used to harvest scallops. Project managers replied that they had agreed to this cover this topic as part of a final report. Mr. Larsen and the project managers agreed they would work out any concerns about the placement of lantern nets in areas where lobster fishing took place. Project managers also expressed a need to further discuss their request to NMFS for an experimental fishery in order collect small scallops for seeding purposes.



Mew locatai sndh
of Nomans Land

MIT Sea Grant College Program
Center for Fisheries Engineering Research

FAX Message

Page one of two

Date: 11 April 1996

To: Ron Smolowitz
Coonamesset Farm
227 Hatchville Road
East Falmouth, MA 02536

FAX: 508-564-5073
Phone: 564-5516

From: Cliff Goudey
MIT Bldg. E38-272
292 Main Street
Cambridge, MA 02139

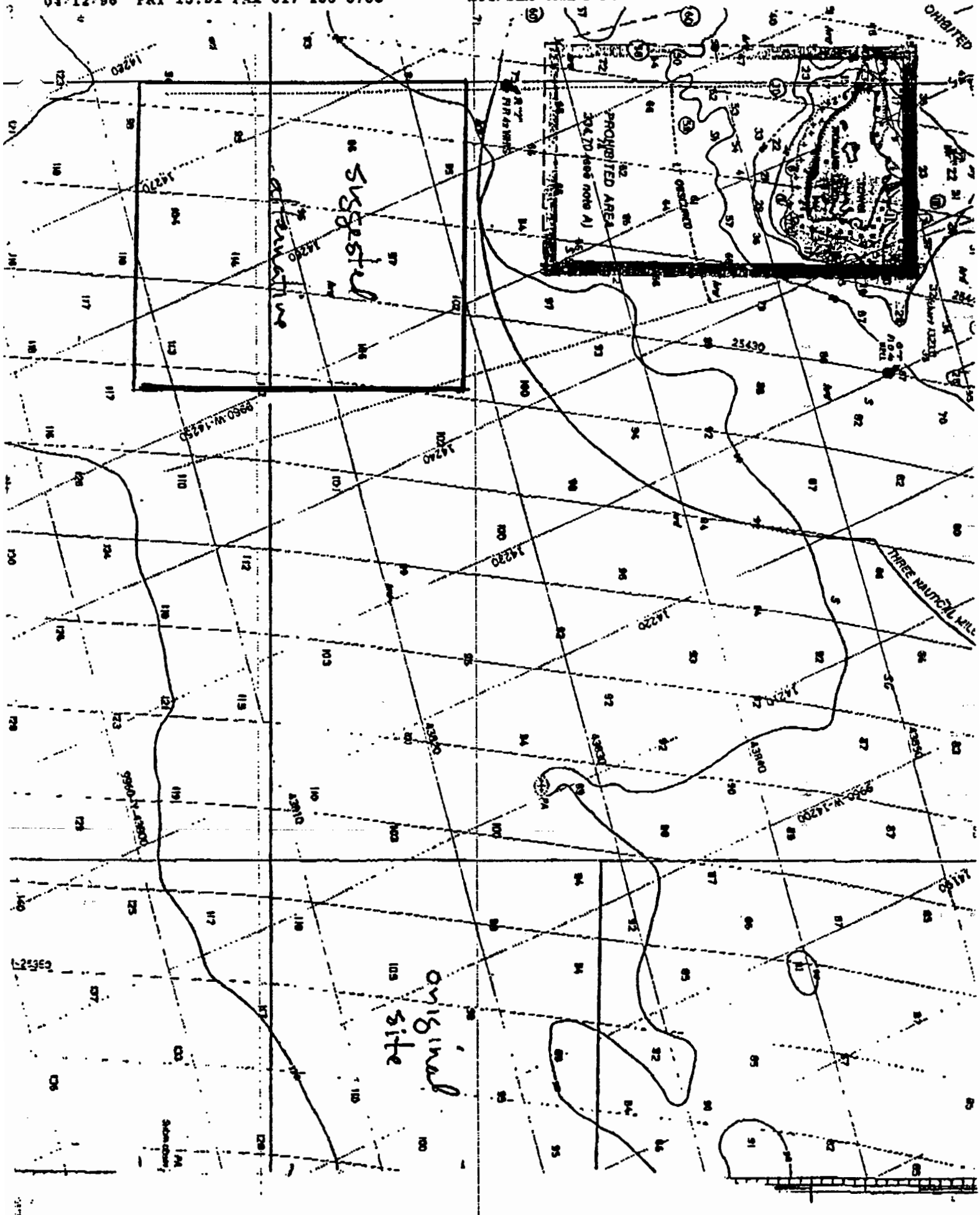
Fax: 617-258-5730
Phone: 253-7079
email: cgoudey@mit.edu

Subj. Alternative site coordinates

I have plotted a new location that meets the concensus of today's meeting. The coordinates are

Corner	Lat. N	Long. W	Loran-W	Loran-Y
NW	41° 11.8'	70° 50'	14267	43834
NE	41° 11.8'	70° 46'	14244	43828
SE	41° 08.8'	70° 46'	14255	43807
SW	41° 08.8'	70° 50'	14278	43813

In the attached copy of the 13218 chart, I have included the original and the suggested alternative. I plan to call Johnathan to see if he would like this information.


PROHIBITED AREA
THREE NAUTICAL MILE
suggested boundaries
original site

NEW ENGLAND FISHERY MANAGEMENT COUNCIL
Suntaug Office Park - 5 Broadway - Saugus, Massachusetts 01906
617/231-0422 FTS: 617/565-8457

PUBLIC ATTENDANCE SHEET

ATTENDANCE AT: Scallop Amendment #5 Public Hearing (Westport Project)
DATE: May 17, 1996 LOCATION: Cranberry Experiment Station, Wareham, MA
CERTIFIED BY: _____

PLEASE PRINT

Name	Mailing Address	Telephone
Phil Coates	NEFMC	
Cliff Goudey	MIT Sea Grant	617 253-7079
Dale Leavitt	WHOI-	508 289-2997
John T. Caskey	NMFS	508-281-9118
MARGARET TONER	NMFS	401-847-3115
John A Larsen	Box 121 Edgartown	508-627-3938
Ronald Smolowitz	277 Hatchville Rd	508-564-5516
RICHARD TAYLOR	BOX 7002 GLOUCESTER	508-281-3146
Pat Fiorelli	NEFMC Staff	

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930-2298

NOV 22 1996

Joseph M. Brancaleone, Chairman
New England Fishery Management Council
Suntaug Office park
5 Broadway (Route 1)

Dear Joe:

This letter is to notify you that Amendment 5 to the Atlantic Sea Scallop Fishery Management Plan has been approved. This amendment authorizes an 18 month closure period to allow scientists and technical experts, in cooperation with fishers, to conduct an experiment and demonstration project involving sea scallop research, enhancement and aquaculture. The action closes a nine square mile site to mobile fishing gear and partially closes the site to non-mobile gear, and temporarily exempts vessels participating in the experiment from fishing regulations.

Sincerely,

Harold C Mears

for

Dr. Andrew A. Rosenberg
Regional Administrator

cc: Council (11/25)
LJG
faxed to Gousey (11/25)
Smolowitz

appropriate aeronautical charts thereby enabling pilots to either circumnavigate the area, continue to operate under VFR to and from the airport, or otherwise comply with IFR procedures. Class E airspace areas extending from 700 feet or more above the surface of the earth are published in paragraph 6005 of FAA Order 7400.9D, dated September 4, 1996, and effective September 16, 1996, which is incorporated by reference in 14 CFR 71.1. The Class E airspace designation listed in this document will be published subsequently in the Order.

The Direct Final Rule Procedure

The FAA anticipates that this regulation will not result in adverse or negative comment and, therefore, is issuing it as a direct final rule. Previous actions of this nature have not been controversial and have not resulted in adverse comments or objections. The amendment will enhance safety for all flight operations by designating an area where VFR pilots may anticipate the presence of IFR aircraft at lower altitudes, especially during inclement weather conditions. A greater degree of safety is achieved by depicting the area on aeronautical charts. Unless a written adverse or negative comment, or a written notice of intent to submit an adverse or negative comment is received within the comment period, the regulation will become effective on the date specified above. After the close of the comment period, the FAA will publish a document in the Federal Register indicating that no adverse or negative comments were received and confirming the date on which the final rule will become effective. If the FAA does receive, within the comment period, an adverse or negative comment, or written notice of intent to submit such a comment, a document withdrawing the direct final rule will be published in the Federal Register, and a notice of proposed rulemaking may be published with a new comment period.

Comments Invited

Although this action is in the form of a final rule and was not preceded by a notice of proposed rulemaking, comments are invited on this rule. Interested persons are invited to comment on this rule by submitting such written data, views, or arguments as they may desire. Communications should identify the Rules Docket number and be submitted in triplicate to the address specified under the caption ADDRESSES. All communications received on or before the closing date for comments will be considered, and this rule may be amended or withdrawn in light of the comments received. Factual information that supports the commenter's ideas and suggestions is extremely helpful in evaluating the effectiveness of this action and determining whether additional rulemaking action would be needed.

Comments are specifically invited on the overall regulatory, economic, environmental, and energy aspects of the rule that might suggest a need to modify the rule. All comments submitted will be available, both before and after the closing date for comments in the Rules Docket for examination by interested persons. A report that summarizes each FAA-public contact concerned with the substance of this action will be filed in the Rules Docket.

Commenters wishing the FAA to acknowledge receipt of their comments submitted in response to this rule must submit a self-addressed, stamped postcard on which the following statement is made: "Comments to Docket No. 96–ACE–22." The postcard will be date stamped and returned to the commenter.

Agency Findings

The regulations adopted herein will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that this final rule does not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

The FAA has determined that this regulation is noncontroversial and unlikely to result in adverse or negative comments. For the reasons discussed in the preamble, I certify that this regulation (1) is not a "significant regulatory action" under Executive Order 12866; (2) is not a "significant rule" under Department of Transportation (DOT) Regulatory Policies and Procedures (44 FR 11034, February 26, 1979); and (3) if promulgated, will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act. A copy of it may be obtained by contacting the Rules Docket at the location provided under the caption ADDRESSES.

List of Subjects in 14 CFR Part 71

Airspace, Incorporation by reference, Navigation (air).

Adoption of the Amendment

Accordingly, the Federal Aviation Administration amends part 71 of the Federal Aviation Regulations (14 CFR part 71) as follows:

PART 71—AMENDED

1. The authority citation for part 71 continues to read as follows:

Authority: 49 U.S.C. 106(g); 40103, 40113, 40120; E.O. 10854, 24 FR 9565, 3 CFR, 1959–1963 Comp., p. 389; 14 CFR 11.69.

§71.1 [Amended]

2. The incorporation by reference in 14 CFR 71.1 of Federal Aviation Administration Order 7400.9D, Airspace Designations and Reporting Points, dated September 4, 1996, and effective September 16, 1996, is amended as follows:

Paragraph 6005 Class E airspace areas extending upward from 700 feet or more above the surface of the earth.

* * * * *

ACE NE E5 Alliance, NE [Revised]

Alliance Municipal Airport, NE
(lat. 42°03'12" N., long. 102°48'13" W.)
Alliance VOR/DME
(lat. 42°03'20" N., long. 102°48'16" W.)

That airspace extending upward from 700 feet above the surface within a 6.8-mile radius of the Alliance Municipal Airport and within 3 miles each side of the 145° radial of the Alliance VOR/DME extending from the 6.8-mile radius to 10.5 miles southeast of the VOR/DME and within 3 miles each side of the 302° radial of the Alliance VOR/DME extending from the 6.8-mile radius to 8.7 miles northwest of the VOR/DME.

* * * * *

Issued in Kansas City, MO, on December 17, 1996.

Herman J. Lyons, Jr.,

Manager, Air Traffic Division, Central Region.

[FR Doc. 97–847 Filed 1–13–97; 8:45 am]

BILLING CODE 4910–13–M

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

15 CFR Part 902

50 CFR Part 648

[Docket No. 960910252–6329–02; I.D. 082296B]

RIN 0648–AI77

Fisheries of the Northeastern United States; Atlantic Sea Scallop Fishery; Amendment 5

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Final rule.

SUMMARY: NMFS issues this final rule to implement Amendment 5 to the Fishery Management Plan for the Atlantic Sea Scallop Fishery (FMP). The final rule closes a 9 mi² (23.31 km²) site to transiting and fishing with other than hand gear for an 18-month period to allow for the conduct of a NMFS-sponsored sea scallop aquaculture research project, provides for exemptions from the closure for vessels using certain gear types and for vessels participating in the project, and provides for temporary exemptions for vessels participating in the project from certain fishing regulations that might inhibit or prevent their performing any activity necessary for project operations. The intended effect of this action is to support the aquaculture research project and prevent conflicts between fishing gear and project equipment for the limited duration of the project.

EFFECTIVE DATE: February 13, 1997 through July 15, 1998.

ADDRESSES: Copies of Amendment 5, its regulatory impact review (RIR), the initial regulatory flexibility analysis contained within the RIR, and the environmental assessment are available from Christopher Kellogg, Acting Executive Director, New England Fishery Management Council, Suntaug Office Park, 5 Broadway, Saugus, MA 01906–1097.

Comments regarding burden-hour estimates for collection-of-information requirements contained in this final rule should be sent to Dr. Andrew A. Rosenberg, Regional Administrator, 1 Blackburn Drive, Gloucester, MA 01930, and the Office of Information and Regulatory Affairs, Office of Management and Budget (OMB), Washington, D.C. 20502 (Attention: NOAA Desk Officer).

FOR FURTHER INFORMATION CONTACT: Paul H. Jones, Fishery Policy Analyst, 508–281–9273.

SUPPLEMENTARY INFORMATION: Amendment 5 to the FMP was prepared by the New England Fishery Management Council (Council). A notice of availability for the amendment when it was proposed, was published on August 29, 1996 (61 FR 45395), and a proposed rule to implement it was published on September 20, 1996 (61 FR 49428). Details of this action were described in the preamble to the proposed rule and are not repeated here.

Approved Management Measures

This final rule establishes a 9 mi² (23.31 km²) area closure approximately 12 mi (22.22 km) southwest of the island of Martha's Vineyard, MA (hereinafter called the Sea Scallop Experimental Area), to transiting and fishing with other than handgear for an 18-month period to allow for the conduct of a NMFS-sponsored (Saltonstall-Kennedy (NOAA Award NA 66FD0027)) sea scallop aquaculture research project and provides for exemptions from the closure for vessels using certain gear types and for vessels participating in the project.

Additionally, this final rule provides the Regional Administrator (RA) with authority to temporarily exempt a vessel participating in the project from any specific Federal fishing regulation which inhibits or prevents the vessel from performing any activity necessary for project operations, such as regulations prohibiting the use of nonconforming fishing gear or the possession of scallops when not fishing under a DAS allocation.

This action prohibits fishing other than with handgear within the Sea Scallop Experimental Area for 18 months. However, fishing with gear other than gillnet and mobile, i.e., trawls and dredges such as lobster pots, longline, and any other gear determined by the RA as not likely to interfere with the research project, will be allowed in the area pursuant to an Allowable Gear Permit (AGP) issued by the RA. This permit requirement will enable the RA to inform vessel operators of the location of the research equipment and avoid potential conflicts between fishery and project activities. Fishers authorized to fish in the Sea Scallop Experimental Area under an AGP may also be required periodically to remove their gear or may be required to set their gear a certain minimum distance from research project activities. At least 2 weeks notice will be provided to vessel operators of any requirement to relocate fishing gear.

All vessels will be allowed to transit the area at any time, provided their fishing gear is properly stowed.

Vessels participating in the project will be allowed to fish within and transit the Sea Scallop Experimental Area pursuant to an EFP issued by the RA. Such EFP may exempt such vessel from specific Federal fishing regulations which may inhibit or prevent that vessel from performing any activity necessary for project operations such as regulations prohibiting the use of non-conforming fishing gear or the possession of scallops when not fishing under a DAS allocation. Vessels issued an EFP are exempt from DAS requirements for any trip transiting to and from, and conducted exclusively within, the Sea Scallop Experimental Area, and for the portion of any trip used to transport sea scallops from the fishing grounds to the area. The EFP also may allocate and authorize the use of up to 2 additional DAS for the collection of sea scallops from the fishing grounds for transportation to the Sea Scallop Experimental Area. Vessels issued an EFP must comply with all conditions and restrictions specified in the permit.

Comments and Responses

Written comments were received from one individual.

Comment: The commenter expressed concern about lobster gear that is typically fished in a portion of the Sea Scallop Experimental Area for about 6 months per year, and whether the project managers will be able to work around lobster gear during the research project period.

Response: The Regional Administrator will issue AGPs to lobster pot vessels interested in fishing within the Sea Scallop Experimental Area. Lobster fishers may be required to remove their gear periodically or may be required to set fishing gear a certain minimum distance from research project activities. The AGP program provides a means by which to communicate the dates and specific locations of project equipment and activities to those who are fishing in the area. At least 2 weeks notice will be provided prior to activities that would require removal of fishing gear. A minimum of 4 weeks notice will be provided in the event that more than 25 percent of the closed area is involved. NMFS will continue to stress to the principal NOAA grant investigators for the project that communication between fishers and project managers be maintained for the duration of the project to prevent conflicts.

Changes From the Proposed Rule

Changes were made to § 648.56(a) to clarify which permits are required for vessels participating in the sea scallop aquaculture research project or fishing within the Sea Scallop Experimental Area, but not participating in the project. Editorial simplifications and clarifications were made throughout the rule.

Classification

The Regional Administrator determined that this final rule is necessary for the conservation and management of the Atlantic sea scallop fishery and that it is consistent with the Magnuson-Stevens Act Fishery Conservation and Management Act (Magnuson-Stevens Act) and other applicable law.

This final rule has been determined to be significant for the purposes of E.O. 12866. The action raises a novel legal or policy issue arising out of a legal mandate under the Magnuson-Stevens Act, in that it may be viewed as setting a precedent for establishing other aquaculture efforts in the exclusive economic zone.

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce certified to the Chief Counsel for Advocacy of the Small Business Administration when this rule was proposed that it would not have a significant economic impact on a substantial number of small entities. The comment received and the changes made to the rule do not change the basis for that certification. Accordingly, a regulatory flexibility analysis was not prepared.

Notwithstanding any other provision of law, no person is required to respond to nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act (PRA) unless that collection of information displays a currently valid OMB control number.

This rule contains one new collection-of-information requirement subject to the PRA. This collection-of-information requirement has been approved by OMB, and the OMB control number and public reporting burden are listed as follows: Sea Scallop Experimental Area authorization request, (0.5 hours/response) under OMB Control Number 0648–0321.

The estimated response time includes the time needed for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection-of-information. Send comments regarding this burden estimate, or any other aspect of the collection-of-information to NMFS and OMB (see ADDRESSES).

NMFS reinitiated consultation on the Atlantic Sea Scallop FMP on October 7, 1996. This consultation will consider new information concerning the status of the northern right whale. The Regional Administrator has determined that the implementation of Amendment 5, pending completion of that consultation, will not result in any irreversible or irretrievable commitment of resources that would have the effect of foreclosing the formulation or implementation of any reasonable and prudent alternative measures.

List of Subjects

15 CFR Part 909

Reporting and recordkeeping requirements.

50 CFR Part 648

Fisheries, Fishing, Reporting and recordkeeping requirements.

Dated: January 8, 1997.

Charles Karnella,

Acting Deputy Assistant Administrator for Fisheries, National Marine Fisheries Service.

For the reasons set out in the preamble, 15 CFR chapter IX and 50 CFR chapter VI are amended as follows:

15 CFR CHAPTER IX

PART 902—NOAA INFORMATION COLLECTION REQUIREMENTS UNDER THE PAPERWORK REDUCTION ACT; OMB CONTROL NUMBERS

1. The authority citation for part 902 continues to read as follows:

Authority: 44 U.S.C. 3501 *et seq.*

2. In §902.1, in paragraph (b), the table is amended by adding, in numerical order, the following entry to read as follows:

§902.1 OMB control numbers assigned pursuant to the Paperwork Reduction Act.

* * * * *

(b) * * *

CFR part or section where the information collection requirement is located	Current OMB control number (all numbers begin with 0648–)
* * * * *	
50 CFR	
* * * * *	
648.56	–0321
* * * * *	

50 CFR CHAPTER VI

PART 648—FISHERIES OF THE NORTHEASTERN UNITED STATES

3. The authority citation for part 648 continues to read as follows:

Authority: 16 U.S.C. 1801 *et seq.*

4. In §648.14, paragraph (a)(96) is added to read as follows:

§648.14 Prohibitions.

(a) * * *

(96) Fish within or transit, with other than handgear, the Scallop Experimental Area defined in §648.56(a)(1), except as provided for in §648.56 (a)(2) and (a)(3).

* * * * *

5. Section 648.56 is added to subpart D to read as follows:

§648.56 Scallop research project.

(a)(1) *Scallop experimental area.* From February 13, 1997 through July 15, 1998, no fishing vessel or person on a fishing vessel may fish within or transit, with other than handgear, the area known as the Sea Scallop Experimental Area, as defined by straight lines connecting the following points in the order stated, except as provided for in paragraphs (a)(2) and (a)(3) of this section:

Point	Latitude	Longitude
1	41°11.8′ N.	70°50′ W.
2	41°11.8′ N.	70°46′ W.
3	41°08.8′ N.	70°46′ W.
4	41°08.8′ N.	70°50′ W.

(2) *Exemptions.* A fishing vessel and persons on a fishing vessel may fish within or transit the Sea Scallop Experimental Area:

(i) With pot gear and traps, longline gear, or any other gear, provided such pot gear and traps, longline gear, or other gear is determined by the Regional Director as not likely to interfere with the sea scallop aquaculture research project in the Sea Scallop Experimental Area, and provided such vessel has been issued an allowed gear permit (AGP) under paragraph (a)(4)(i) of this section; or

(ii) If such vessel has been issued an experimental fishing permit (EFP) under paragraph (a)(4)(i) of this section to participate in the sea scallop aquaculture research project in the Sea Scallop Experimental Area.

(3) *Transiting.* Vessels that are not exempted from the prohibition against fishing within or transiting the Sea Scallop Experimental Area under paragraph (a)(2) of this section may transit such area provided their gear is stowed in accordance with the provisions of §648.81(e).

(4) *Allowed gear and experimental fishing permits*—(i) *Allowed gear permits.* The Regional Director may issue an AGP to any vessel to fish within and transit the Sea Scallop Experimental Area with the gear specified in paragraphs (a)(2)(i) of this section. Vessels issued an AGP may be required to move their gear within, or remove their gear from, the area upon notification by the Regional Director and must comply with any additional conditions and restrictions specified in the permit.

(ii) *Experimental fishing permits.* The Regional Director may issue an EFP under the provisions of § 648.12, if consistent with the provisions of paragraph (a)(4)(iv) of this section, to any vessel participating in the sea scallop aquaculture research project to fish within and transit the Sea Scallop Experimental Area. Such an EFP may exempt such vessel from specific Federal fishing regulations which may inhibit or prevent that vessel from performing any activity necessary for project operations such as regulations prohibiting the use of non-conforming fishing gear or the possession of scallops when not fishing under a DAS allocation. Vessels issued an EFP shall be exempted from DAS requirements as specified in the FMP for any trip in which the vessel engages exclusively in project activities such as bottom surveying, biological sampling, or use of non-regulated hand gear outside the Sea Scallop Experimental Area. The EFP also may allocate and authorize the use of up to 2 additional DAS for project activities relating to scallop seeding. Vessels issued an EFP must comply with all conditions and restrictions specified in the permit.

(iii) A vessel with an AGP or EFP must carry the permit on board the vessel while fishing in the Sea Scallop Experimental Area or participating in the scallop aquaculture project.

(iv) The Regional Director may not issue an AGP or EFP unless he determines that issuance is consistent with the objectives of the FMP, the provisions of the Magnuson-Stevens Act, and other applicable law and will not:

(A) Have a detrimental effect on the sea scallop resource and fishery;

(B) Create significant enforcement problems; or

(C) Have a detrimental effect on the scallop project.

(5) *Application.* An application for an AGP or EFP must be in writing to the Regional Director and be submitted at least 30 days before the desired effective date of the permit. The application must include, but is not limited to, the following information:

(i) The date of application.

(ii) The applicant's name, current address, telephone number and fax number if applicable.

(iii) The current vessel name, owner address, and telephone number.

(iv) The vessel's Federal permit number.

(v) The USCG documentation number.

(vi) The species (target and incidental) expected to be harvested.

(vii) The gear type, size, buoy colors, trap identification markings and amount of gear that will be used; and exact time(s) fishing will take place in the Sea Scallop Experimental Area.

(viii) The signature of the applicant.

(b) [Reserved]

[FR Doc. 97–872 Filed 1–13–97; 8:45 am]
BILLING CODE 3510–22–P

DEPARTMENT OF THE TREASURY

Office of Foreign Assets Control

31 CFR Part 560

Iranian Transactions Regulations

AGENCY: Office of Foreign Assets Control, Treasury.

ACTION: Notice; extension of time to report.

SUMMARY: The Office of Foreign Assets Control of the U.S. Department of the Treasury is extending to May 30, 1997, the deadline for submission of quarterly reports pursuant to § 560.603 of the Iranian Transactions Regulations for the quarters ending December 31, 1996, and March 31, 1997.

EFFECTIVE DATE: January 10, 1997.

FOR FURTHER INFORMATION CONTACT: Loren L. Dohm, Chief, Blocked Assets Divison (tel.: 202/622–2440), or William B. Hoffman, Chief Counsel (tel.: 202/622–2410), Office of Foreign Assets Control, Department of the Treasury, Washington, DC 20220.

SUPPLEMENTARY INFORMATION:

Electronic and Facsimile Availability

This document is available as an electronic file on *The Federal Bulletin Board* the day of publication in the Federal Register. By modem, dial 202/515–1387 and type "/GO FAC," or call 202/512–1530 for disk or paper copies. This file is available for downloading without charge in WordPerfect 5.1, ASCII, and Adobe Acrobat™ readable (*.PDF) formats. For Internet access, the address for use with the World Wide Web (Home Page), Telnet, or FTP protocol is: fedbbs.access.gpo.gov. The document is also accessible for downloading in ASCII format without charge from Treasury's Electronic Library ("TEL") in the "Business, Trade and Labor Mall" of the FedWorld bulletin board. By modem, dial 703/321–3339, and select the appropriate self–expanding file in TEL. For Internet access, use one of the following protocols: Telnet = fedworld.gov (192.239.93.3); World Wide Web (Home Page) = http://www.fedworld.gov; FTP = ftp.fedworld.gov (192.239.92.205). Additional information concerning the programs of the Office of Foreign Assets Control is available for downloading from the Office's Internet Home Page: http://www.ustreas.gov/treasury services/fac/fac.html, or in fax form through the Office's 24–hour fax–on–demand service: call 202/622–0077 using a fax machine, fax modem, or (within the United States) a touch–tone telephone.

Notice

On November 15, 1996, the Office of Foreign Assets Control ("OFAC") published an amendment to § 560.603 of the Iranian Transactions Regulations, 31 CFR Part 560 (the "Regulations"), which imposes reporting requirements on United States persons with foreign affiliates (See 61 FR 58480). Any report required to be submitted to OFAC pursuant to § 560.603 of the Iranian Transactions Regulations for the quarter ending December 31, 1996, or for the quarter ending March 31, 1997, may be filed up to but no later than May 30, 1997.

Issued: January 7, 1997.

R. Richard Newcomb,

Director, Office of Foreign Assets Control.

Approved: January 7, 1997.

James E. Johnson,

Assistant Secretary (Enforcement)

[FR Doc. 97–974 Filed 1–10–97; 12:08 pm]
BILLING CODE 4810–25–F

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 1, 2, 21, 22, 60, 61, 62, 147, 262, 272, 707, 763

[FRL–5674–2]

Technical Amendments to Revise Addresses

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule; technical amendment.

SUMMARY: The EPA is revising the address for its Region 5 office, and those of the environmental agencies of the States of Illinois, Michigan and Ohio in 40 CFR Parts, 1, 2, 21, 60, 61, 62, 147, 272, 707, and the appendices to 40 CFR Parts 22, 262, and 763 because of changes in office locations. This document does not change the substantive requirements of the standards.

EFFECTIVE DATE: This action becomes effective January 14, 1997.

FOR FURTHER INFORMATION CONTACT: John Gaitskill, United States Environmental Protection Agency, Region 5, Chicago, Illinois 60604–3590, (312) 886–6795.

APPENDIX G

FMP Amendment

SeaStead Project

Coonamessett Farm

Amendment #5
to the
Atlantic Sea Scallop Fishery Management Plan

Final

Prepared by

New England Fishery Management Council
in consultation with

MIT Sea Grant College Program
and the
Conservation Law Foundation

Submitted by NEFMC: July 11, 1996
Action by NMFS:

TABLE OF CONTENTS

1.0 Introduction

The New England Fishery Management Council (Council, NEFMC), through the implementation of Amendment #5 to the Sea Scallop Fishery Management Plan (FMP), proposes to establish a temporary experimental use area located approximately twelve miles southwest of the island of Martha's Vineyard. The Council intends to close the area to all fishing activities during the term of this experiment with the exception of those specifically discussed in this document. During the eighteen-month closure period scientists and technical experts, in cooperation with fishermen, will conduct an experiment and demonstration project involving sea scallop research, enhancement and aquaculture.

The experimental use proposal was submitted to the Council by consortium of sea scallop operation owners in consultation with the staff of the MIT Sea Grant Program and the Conservation Law Foundation, Inc. (proponents). The original proposal has been refined and improved to minimize the impact of the temporary closure on existing fishing activities.

2.0 Purpose and Need

2.1 Background

The New England fishing industry is struggling with reduced stocks levels in many commercially valuable species including shellfish resources. All fishermen will be operating at lower levels of production causing a ripple effect on the economy, as well as processors and suppliers.

The value of the sea scallop industry to Southeastern Massachusetts exceeds half a billion dollars annually in good years. The economic impact analysis included with Amendment #4 to the Scallop FMP predicted that economic hardships will be experienced both short-term and three and four years into the plan.

The decline of the scallop resource has been blamed on overfishing, usually thought of in terms of excessive harvest removals. There are, however, other fishing impacts that play significant roles. Frequent towing over the bottom may impact the productivity of the scallops and other species in ways that are not clearly understood. There is also a non-catch mortality to scallops caused by the dredge while on the bottom (i.e., physical damage, sediment suspension effects, etc.). Finally, there is the uncertainty associated with the potential loss of value and spawning potential of juvenile scallop bycatch, depending on the mortality rate of that bycatch.

Existing management options can only address these problems by decreasing fishing effort and harvesting efficiencies, both of which reduce employment opportunities and fleet productivity. Better information on sea scallop enhancement, harvest gear/scallop/habitat interactions, open ocean cage engineering and growth rates of transferred juvenile brood stock in both cage culture and open bottom culture would provide the Council and area fishermen with the potential tools to expand the resource base.

Sea scallop (*Placopecten magellanicus*) aquaculture is one of the most promising commercial opportunities for the Northwest Atlantic, with many of the prerequisites for success already in place. Small scallops are plentiful; the harvesting and processing infrastructure is in place; the unit value for market-sized sea scallops is high; and the sea scallop market is well established. Most importantly, the scallops can be reared on naturally occurring feed without the costs or environmental considerations associated with finfish aquaculture.

2.2 Sea Scallop Culture Outside the U.S.

Scallop culture, as practiced today, was pioneered in the Mutsu Bay region of Japan (Aoyama, 1989). The scallop fishery in that area was subject to significant fluctuations in abundance, a factor common to most scallop fisheries. In 1935, Japanese researchers initiated a program to overcome the fluctuations in scallop abundance. The early scientific efforts concentrated on ways to collect scallop spat (the stage in the scallop's life after the planktonic phase, when it settles to the bottom).

By 1953, local fisheries cooperatives were collecting spat to re-seed fishing grounds. In 1955, they started to hold the spat for short periods of time before re-seeding in order to increase scallop survival. In 1964, a breakthrough occurred in spat collector design that significantly increased the number of spat collected. The increase in availability led to improved ways to hold large numbers of scallops in captivity until fully grown (Ito and Byakuno, 1989). Today seventy percent of Japan's scallop harvest is cultured. The harvest is stable from year to year and is an order of magnitude larger than the previous wild harvest fishery. There are over 1,900 scallop harvesting firms in the Mutsu Bay region alone and many other regions also produce cultured scallops.

Since the 1970's, countries in all parts of the world have begun scallop culture operations based on the Japanese model (Kirk, 1979; Paul et al., 1981; Reyes, 1986; Naidu and Cahill, 1986). Some depend on collecting spat, others use hatcheries to produce the spat. Canada has been working on culturing the sea scallop and is on the verge of establishing a successful culture-based industry. The Canadian Ocean Production Enhancement Network (OPEN) may soon be funded by the federal Networks of Centers of Excellence program in the amount of $23 million to conduct a three-part program, one of which is scallop enhancement.

2.3 Need for Amendment

While the commercial potential for sea scallop pen culture and natural enhancement is vast, significant applied research and development activity, coupled with fleet education and training, is essential to make sea scallop aquaculture a commercial success in New England. This amendment serves to facilitate essential research aimed at developing techniques and practices that could allow the scallop fishery to evolve from one based exclusively wild-capture to an industry that also incorporates modern husbandry, enhancement and open-ocean cage culture.

This project represents a collaboration among a broad range of experts and organizations and was made possible only through government support. The project proposal was selected for Saltonstall-Kennedy Grant Program funding, in

part, because it addressed an area identified as a 1994 priority. As funded, the activities proposed can occur only if some measure of exclusivity is granted to the participants within the project site.

Although some elements of the planned approach have been proven commercially in other countries, the project is experimental in nature. The objective is to obtain a comprehensive understanding of the issues associated with scallop seeding and grow-out. The proposed activities and required environmental monitoring would require limits on activities within the experimental area. Therefore, most fishing activities would not be allowed. Without restrictions or controls on fishing, expensive grow-out or monitoring equipment could be inadvertently destroyed by towed gear.

This amendment would establish an experimental area pursuant to 50 CFR § 650.29 that would restrict certain fishing and transit activities during the term of the proponents' Sea Scallop Enhancement Project. Although this project is only temporary and does not create any permanent rights or interests at the experimental site, the success of the experiment is dependent on additional restrictions for the region's licensed fishermen. As a result, NOAA General Counsel has advised the NEFMC and the proponents that a full plan amendment is necessary.

3.0 Proposed Action and Rationale

3.1 Preferred Alternative/Sea Scallop Experimental Area

For the purposes of conducting controlled research in sea scallop culture and enhancement, a nine (9) square mile site approximately twelve (12) miles southwest of Martha's Vineyard has been identified as a suitable experimental area by the research team assembled by the proponents. A description of the experimental area and the activities that are planned is presented below. All of these activities are essential parts of the planned research/demonstration project. In addition, these activities are specifically included as tasks in the Saltonstall-Kennedy proposal that has been selected for federal funding by the National Marine Fisheries Service (NMFS).

3.2 Description of Area and Project Buoyage

The experimental area is square, three miles on each side, and is located approximately twelve (12) statutory miles southwest of Martha's Vineyard. The northwest corner of the site is at 41°11.8' N, 70°50' W; the northern boundary runs east to 41°11.8' N, 70°46' W; the eastern boundary runs south to 41°08.8' N, 70°46' W; the southern boundary runs west to 41°10' N, 70°40' W; the western boundary then runs north to 41°08.8' N, 70°50' W, the starting point. The site is indicated on a chart of the area in Figure 1.

An enlarged picture of the site is presented in Figure 2, along with the specified buoyage planned for the duration of the experiment. Each corner of the site will be marked by a picket buoy. They will be lighted and painted yellow to meet Coast Guard requirements and held in place by chain and anchors.

Several factors were weighed in the site selection analysis that ultimately led to the proposed experimental area. Those factors included:

1) proximity to hatchery and laboratory facilities;
2) ability to monitor and maintain experimental control of the site;
3) proximity to shore-side services for participating vessels;
4) representative of exposed ocean conditions and commercial bottom;
5) availability of NMFS fish landing data;
6) locally based fishermen's identification of areas of low mobile gear activity;
7) surface traffic;
8) water temperature; and
9) natural sets of *Placopecten magellanicus* in non-commercial quantities.

Most of the experimental area will be used for bottom seeding and scallop grow-out. The grow-out area will be arranged in eight lanes which run east/west and are 2.5 miles long by 0.25 miles wide. The lanes will be marked by inflatable buoys at each corner and on each edge of their mid-length.

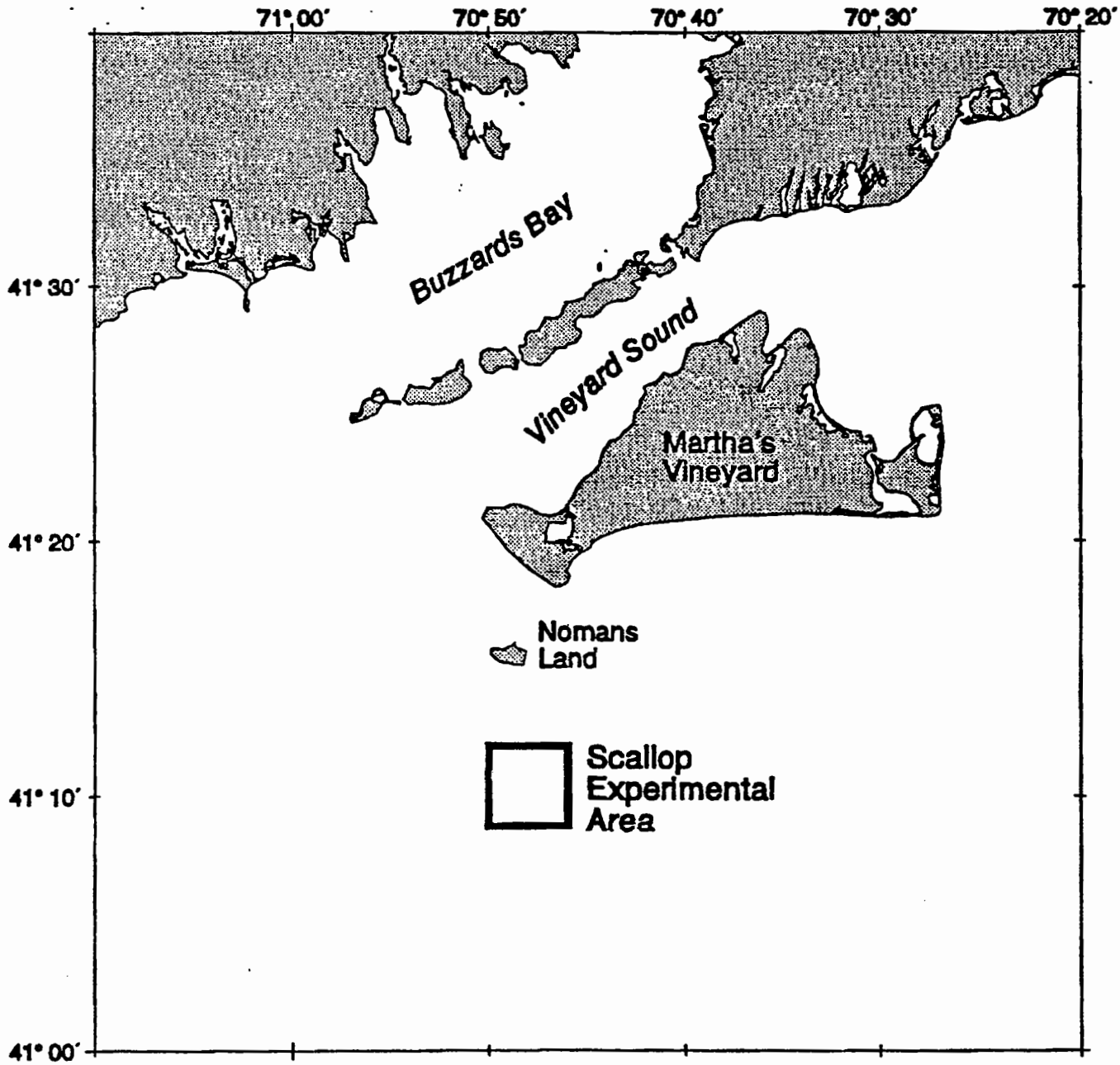


Figure 1. Location of the Sea Scallop Experimental Area

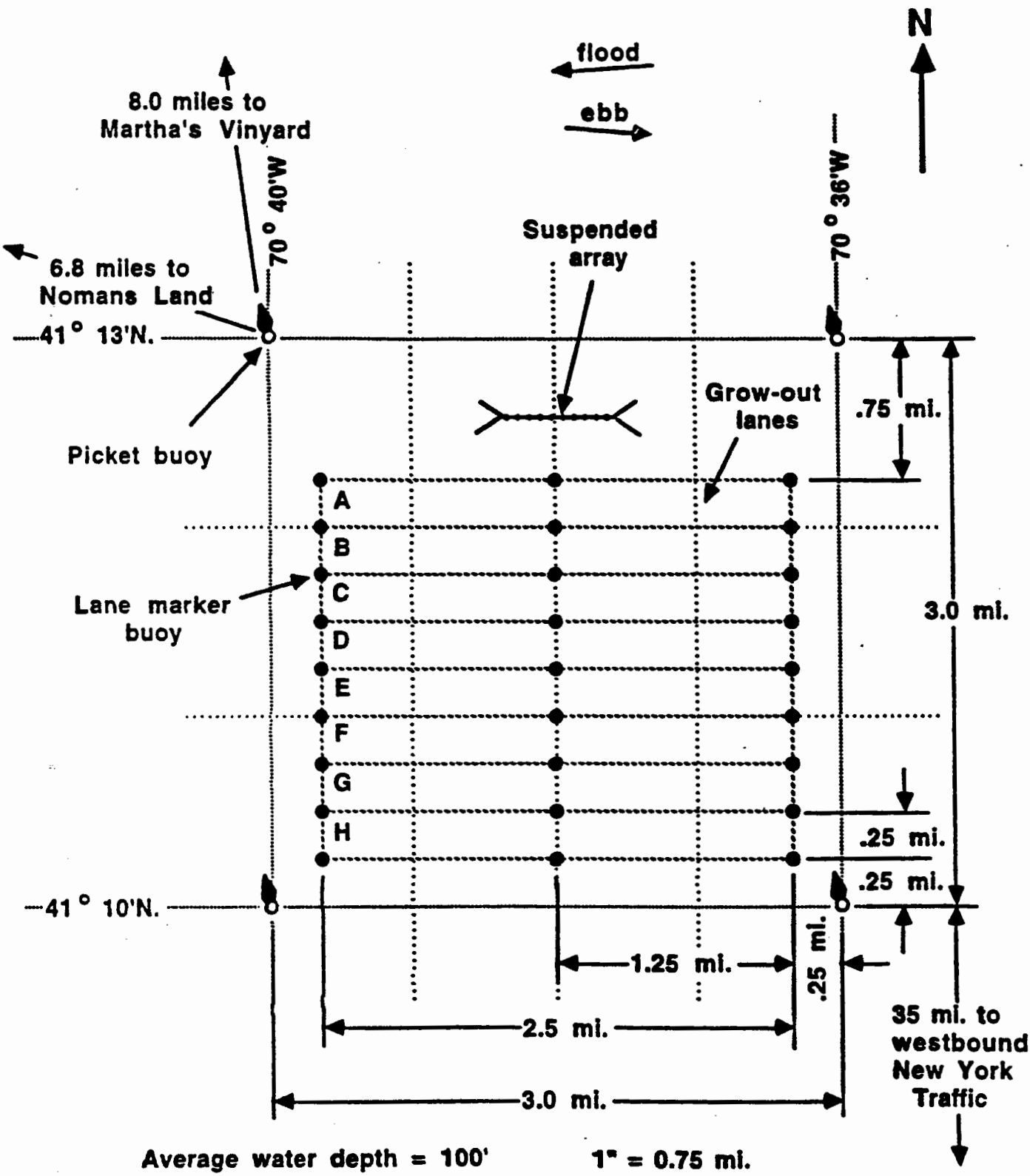


Figure 2. Sea Scallop Experimental Area site plan

The northern portion of the experimental area is set aside for experiments on other methods of scallop culture and grow-out. Two specific methods are planned and anticipated cooperation with other scallop researchers may allow experimentation with additional methods. The first method is aimed at determining the growth rates of sea scallops suspended off-bottom. Large grow-out units, patterned after traditional lantern nets, will be utilized. The severe ocean environment at the site requires measures that will ensure the survival of the suspended grow-out system and minimize the effects of wave motions on the culture process.

Figures 3 and 4 show the plan and side views of the grow-out array. Multiple five-foot-diameter net and hoop grow-out stacks are each suspended below a spar buoy. These buoyed units are connected in a linear array which is anchored at each end. The anchor system is redundant and offers tautness, but with sufficient resiliency to insure survivability. This approach has been designed with the gear handling capability of the region's larger fishing vessels in mind.

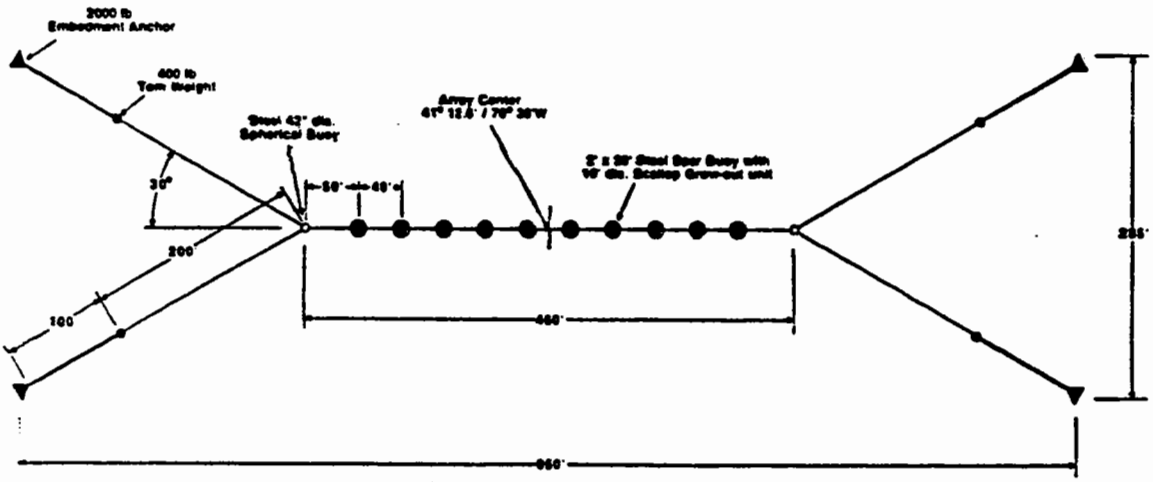


Figure 3. Plan view of suspended sea scallop grow-out array

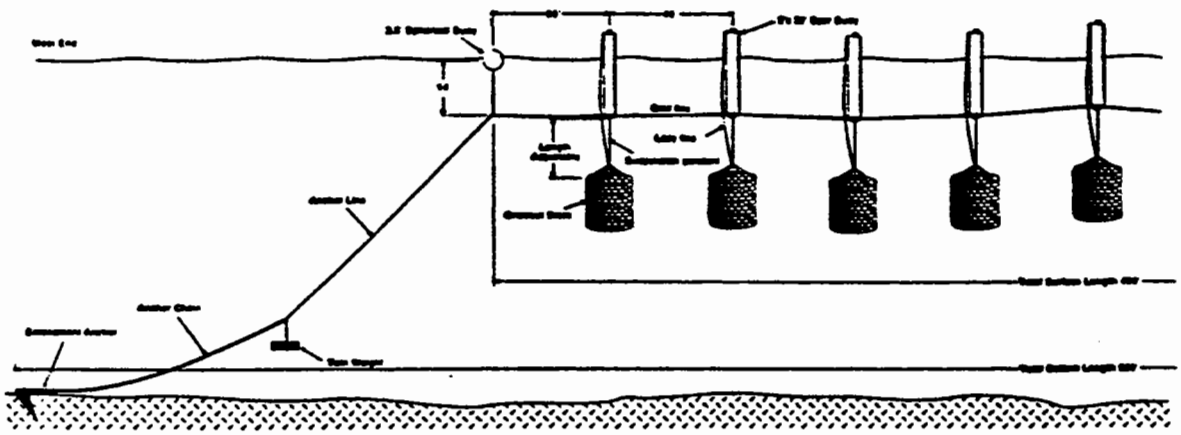


Figure 4. Plan view of suspended sea scallop grow-out array

The second method of culture to be evaluated during the experiment will involve small bottom cages that are similar to lobster traps in shape and method of handling. Figure 5 illustrates one of the planned, three-layer grow-out cages. Each will be buoyed individually with a pot marker. Most of these cages will be located in the vicinity of the suspended array, however some will be located throughout the experimental area. This aspect of the experiment is designed to gather data on a technology that could be adapted to the gear handling capabilities of the region's small lobster or day boat fleet.

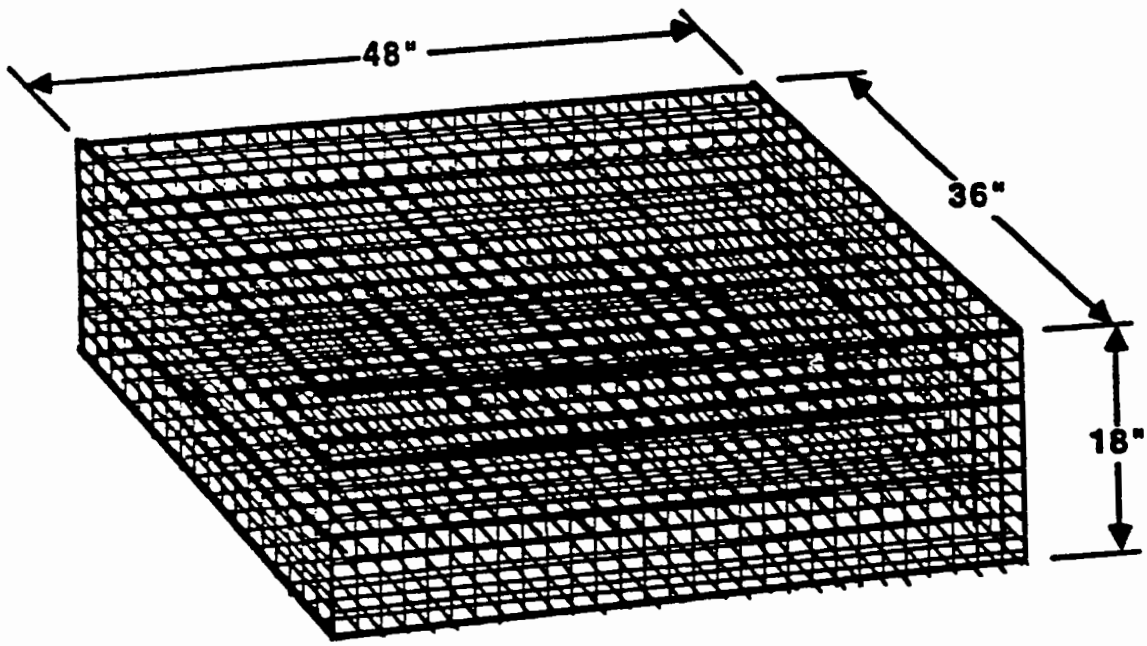


Figure 5. Bottom grow-out cage

3.3 Activity Restrictions in Project Area

Due to the type of experimentation planned at the above site, restrictions are required on the types of activities that can be allowed within the project boundaries. In general, those activities that would not interfere with the conduct of the research or the results of the experiment would be allowed.

- Allowed Activities:
  1) sea scallop culture, growth, research, and monitoring activities as described in this section by project participants;
  2) scallop seeding, sampling, and harvesting by project participants; and
  3) vessel transit.
- Controlled Activities:
  1) lobster trapping;
  2) pot fishing;
  3) pole fishing and jigging and
  4) longlining.
- Prohibited Activities:
  1) otter trawling, mid-water trawling and other related mobile gear fishing;
  2) shellfish dredging;
  3) gillnetting;
  4) anchoring, except in emergencies; and
  5) discharging not in accordance with MARPOL regulations.

3.4 Notification of Controlled Activities

Lobster pot fishing, fishing with handgear and longlining will be allowed within the boundaries of the project area to minimize potential economic impacts on those fisheries. In order to facilitate some project activities, however, restrictions will be necessary. Periodic monitoring, harvesting and predator control activities will require the removal of all fixed gear from portions of the experimental site. Additionally, experimental gear placed within the site could be damaged if fishing gear is placed on top of it. Fishermen, therefore, wishing to operate gear allowed within the project site must apply to the Regional Director for permission.

The Regional Director will issue a letter to authorizing applicants with valid federal permits to deploy gear within the experimental area. The Regional Director will supply the project with a list of all such letter recipients indicating operator name, permit number, boat name and description, gear type, buoy colors and markings, mailing address and telephone number.

The project will notify the Regional Director and each individual fisherman when fixed gear will need to be removed from the area. To the extent possible, the dates and specific locations will be announced well in advance. At least two weeks notice will be provided, however, prior to activities that would require the removal of fishing gear. A minimum of four weeks notice will be provided in the event that more than 25 percent of the closed area is involved. To the extent possible, the project managers will coordinate these required gear removals within the context of the normal seasonal movements or patterns of fishing. A similar notification scheme will be used to inform those who are authorized to fish within the site

about the deployment of experimental gear that would be adversely affected by contact with fixed gear. Such notices would include information about the minimum distances.

To notify fishermen operating within the project site that gear must be removed for brief periods to accommodate project activities,

3.5 Vessel Participation

The following vessels will participate in the research to be conducted at the experimental site and are authorized as specified above:

Vessel Name	LOA	Activity
F/V Westport	98 ft	Gear installation, scallop handling, monitoring, and harvesting
F/V Concordia	116 ft	Gear installation, scallop handling, monitoring, and harvesting
Scallop Vessel #3		Scallop seeding and harvesting
Scallop Vessel #4		Scallop seeding and harvesting
Scallop Vessel #5		Scallop seeding and harvesting
Scallop Vessel #6		Scallop seeding and harvesting
Scallop Vessel #7		Scallop seeding and harvesting
Scallop Vessel #8		Scallop seeding and harvesting
Lobster boat #1		Scallop cage handling and harvesting
Lobster boat #2		Scallop cage handling and harvesting
Lobster boat #3		Scallop cage handling and harvesting
Research vessel #1		Monitoring and sampling
Research vessel #2		Monitoring and scuba work

3.6 Days-at-Sea Accounting Plan

The above vessels hold general category scallop permits and participate in the days-at-sea program established by Amendment #4 to the Sea Scallop Fishery Management Plan. They are currently limited to 180 days of sea scalloping. In order to allow participation in this research project without adversely impacting their ability participate fully in the regular sea scallop fishery, the following procedures will be used to account for days-at-sea during the course of the experiment.

1) Trips in which participating vessels engage exclusively in project activity within the experimental area or project activities such as bottom surveying, biological sampling, or use of non-regulation experiment-related gear will be exempt from the days-at-sea program.

2) Trips in which participating vessels engage in project activity and normal commercial harvesting will not be exempt from the days-at-sea program.

3) Trips in which participating vessels engage in normal commercial harvesting will not be exempt from the days-at-sea program.

4) Participating vessels will be allowed up to two additional days-at-sea each year in partial compensation for time spent engaged in project activities during normal commercial harvesting.

The above days-at-sea accounting plan will apply only to the vessels participating in the project. Items 1 through 3 are intended to provide both a simple and accountable method of implementation. For example, there will be no mixing of exempt and non-exempt activities in the same trip. In addition, participants will not incur "double indemnity" by being charged twice for catching the same scallop.

Item 4 is intended to make up for the time spent by participating vessels in seeding scallops within their experimental lanes or transferring seed to other participating vessels intended for the grow-out array or bottom cages. In the above plan, since those activities occur within normal commercial harvesting trips, the project effort will count against their days-at-sea. This seeding and transfer activity will be recorded and credit will be given accordingly, up to the two-day maximum.

3.7 Collection of Scallops
Juvenile and small sea scallops introduced into the experimental site will be obtained from the bycatch associated with normal commercial harvesting by the eight participating vessels listed above. Regulation New Bedford-style scallop dredges will be used for this purpose.

3.8 At-Sea Transfer of Scallops
The F/V Westport, the F/V Concordia, and Research Vessel #1 are the only participating vessels that will engage in setting up, loading, monitoring, sampling, and harvesting sea scallops in the suspended array. To facilitate this process, transfer of small scallops from other participating scallop vessels to these vessels may occur within the experimental site. In addition, transfer of small scallops from the participating scallop vessels to the participating lobster boats also will occur for the purpose of loading the small bottom cages.

3.9 Transportation of Scallops
Transportation of undersized scallops from the fishing grounds to the experimental site will be aboard the harvesting vessel. Storage systems that allow for water circulation and oxygenation will be used to maximize the survivability of the scallops during transit.

3.10 Seeding of Scallops
Each participating vessel will be assigned a grow-out lane. Each vessel will maintain a record of the amount and location of scallop seed that is placed in their respective lane. Seeding will be done manually. Crew members will cast scallops overboard while the vessel transits a predetermined course in the grow-out lane. Seeding densities will be estimated by assuming the scallops land within a swath width equal to the water depth.

3.11 Non-Regulation Gear

Depending on the size and quantities of small scallops that are landed as bycatch, some directed effort by the F/V Concordia may be necessary using scallop sampling gear or commercial gear modified with a small-mesh liner. This directed effort will be limited to ten days and all scallops, regardless of size will be placed in the experimental area. Trips using this non-regulation gear will not involve normal commercial harvesting or landing activities. The Coast Guard and the Northeast Regional Office of NMFS will be notified by the F/V Concordia of the time and location of this seed harvest effort in advance.

3.12 Experimental Area Monitoring and Sampling

The seeded lanes at the project site will be monitored for growth rate, general health and mortality. Specimens from the bottom sites will be taken periodically by divers. These specimens will be transported in circulating tanks to the Laboratory for Marine Animal Health (LMAH) in Woods Hole, Massachusetts. At the LMAH, scallops collected from each treatment group will be necropsied and evaluated histopathologically. Additionally, moribund scallops from each treatment group will be examined for disease.

Additional samples will be taken for biochemical analysis of the adductor muscle in order to determine how the culture environment may affect the scallop meat. This work will be done by the Department of Aquaculture and Fisheries at the Woods Hole Oceanographic Institution. The samples will be analyzed for total lipids, protein, glycogen and ash content. Scallop samples will be analyzed for biochemical composition at time zero (before deployment onto bottom lanes) and quarterly during the first year of the grow-out process. Fifteen scallops will be selected for analysis from each location at each time interval.

Bottom conditions under and surrounding the suspended arrays will be monitored for any changes caused by project activities. In addition to water column sampling, sediment samples will be tested quarterly for organic matter content. Underwater video recordings will be made of specific survey sites over the course of the project.

3.13 Reporting and the Dissemination of Results

The sea scallop enhancement project described in this amendment has been designed by the project participants and consulting team to provide for the maximum public benefits in return for the temporary restrictions associated with the experimental area. The scientific and engineering information accumulated during the term of the experiment is considered to be in the public domain.

To that end, quarterly reports and a detailed final report will be prepared on all facets of the project. The results will be disseminated to the industry, management authorities, and interested general public. The Project Findings and Conclusions will be offered at a regularly scheduled New England Fishery Management Council meeting by the proponents. The NEFMC Sea Scallop Committee will be kept informed of the progress of the experiment. A column will be written for Commercial Fisheries News once the project has been initiated. A second column will be written on the final results.

4.0 Alternatives to the Proposed Action

4.1 No Action Alternative

The No Action Alternative continues the present Sea Scallop FMP. The existing plan does not regulate activities within the specified area. Activities permitted under the status quo, however, could prevent or significantly impair the experiment and potentially result in damage to expensive gear.

4.2 Exclusive Use Alternative

Under this alternative, the Sea Scallop FMP would be amended to protect the Sea Scallop Enhancement Project from possible interference from all other fishing and maritime activities. The amendment would stipulate that no commercial or recreational fishing activities would be allowed within the experimental area for the 18-month duration of the project. This alternative would prohibit surface traffic in the experimental area under all but exigent weather or emergency circumstances.

4.3 Original Site Alternative

Initially, project managers proposed a 9 square-mile site located ten miles south of Martha's Vineyard. The Council discussed this location, as well as the other aspects of the project with fishermen and other interested members of the public at several subcommittee and Council meetings as well as at a hearing in Woods Hole, Massachusetts on January 19, 1996 (Appendix II). Public comments were then reviewed at the February 27, 1996 Council meeting and the amendment was approved.

In April, 1996 project managers notified the Council that members of the fishing community, including lobstermen, scallopers and trawl vessel operators had met again after the final Council decision and reached consensus on an alternative site. All parties agreed that the new location, approximately 3.5 miles southwest of the original location, was preferable.

To accommodate this agreement the Council withdrew the amendment, which already had been submitted to the National Marine Fisheries Service (NMFS), and held an additional hearing on May 17, 1996 to ensure that all interested parties had an opportunity to comment on the new site (Appendix II). This location was approved by the Council at its meeting on June 6, 1996.

Figure 1. Location of the Sea Scallop Experimental Area

5.0 Environmental Assessment

5.1 Purpose and Need for Proposed Action
See Section 2.0 of this document.

5.2 Description of the Proposed and Alternative Actions
See Section 4.0 of this document.

5.3 Description of the Physical Environment
The sea scallop experimental site has water depths ranging from 14 to 19 fathoms. The site is relatively exposed to ocean waves and swell from all directions except due north. Tidal currents in the area are not expected to exceed one knot. Ocean bottom temperatures at the site have been sampled 14 times since 1981 by NMFS survey cruises and fall within the range of 1.9 (January 1982) to 18.4 (September 1991) degrees Celsius. The substrate is mostly sand bottom with cobbles and boulders present. The western portion of the site may have considerably more rocks present than the southeastern corner.

5.4 Description of the Biological Environment
Eight NMFS survey tows (3 trawl, 3 clam and 2 scallop) indicate the biological environment is typical of sand and rock substrate. Invertebrate species include sea scallops *(Placopecten magellanicus)*, clams *(Arctica islandica, Spisula solidima, Ensis directus, Venus borealis)*, snails *(Lunatia heros)*, sea stars (Asterias sp.), crabs (*Cancer borealis*, Pagurus Sp.) and lobster *(Homarus americanus)*.

Commercial catch data, obtained by NMFS port agent interviews, indicates the presence of the following bottom dwelling finfish species: monkfish *(Lophius americanus)*, cod *(Gadus morhua)*, winter flounder *(Pseudopleuronectes americanus)*, summer flounder *(Paralichthys dentatus)*, yellowtail flounder *(Limanda ferruginea)*, sand-dab *(Scophthalmus aquosus)*, red hake *(Urophycis chuss)*, silver hake *(Merluccius bilinearis)*, sea raven *(Hemitripterus americanus)*, scup *(Stenotomus chrysops)*, black sea bass *(Centropristis striata)*, dogfish *(Squalus acanthias)*, and skates (Raja sp.). Pelagic species present include bluefish *(Pomatomus saltatrix)*, butterfish *(Peprilus triacanthus)*, shad *(Alosa sapidissima)*, and squid *(Loligo pealei)*.

A number of species of endangered and threatened marine mammals under the jurisdiction of the National Marine Fisheries Service may be present at the project site during certain times of the year. These include the northern right whale *(Eubalaena glacialis)*, humpback whale *(Megaptera novaeangliae)*, fin whale *(Balaenoptera physalus)*, leatherback sea turtle *(Dermochelys coriacea)*, green sea turtle *(Chelonia mydas)*, loggerhead sea turtle *(Caretta caretta)*, and Kemp's ridley sea turtle *(Lepidochelys kempi)*. In addition, the harbor porpoise *(Phocoena phocoena)* is proposed for listing as threatened and may also be present at the project site. All of these species may transit the area at certain times during the year on their migrations to or from more northerly feeding and nursery areas. Based on survey data (CeTAP, 1982), however, this area is not known to be a concentration area for any whale or turtle species.

5.5 Description of the Human Environment

Fishermen using this area are primarily from ports in southeastern Massachusetts and Rhode Island. Scallopers from as far south as Virginia and gillnetters from New Hampshire have been known to fish in the general area. The site is primarily fished by lobstermen from Martha's Vineyard. Small draggers from New Bedford fish for winter flounder during the fall/early winter on the southern edge of the site. A seasonal hook fishery for cod has been conducted in the past in this area by vessels from Cape Cod and the Islands. There have been gear conflicts in this area primarily between Martha's Vineyard lobstermen and large offshore scallopers.

For a thorough description of the human environment associated with groundfish fishing activities that may have occurred in the proposed experimental site, see Amendment 5 - section E.6.4 of the Northeast Multispecies FMP. For an equivalent description of the human environment associated with scalloping activities that may have occurred in the proposed experimental site, see Amendment 4 - section 7.G of the Atlantic Sea Scallop FMP.

5.6 Biological Impacts of the Proposed Action

The alternative site approved by the Council on June 6, 1996 is located approximately 3.5 miles southwest of the original area proposed. Because the new site is within the same ten minute square as the original site, and because data are not available on a scale finer scale than ten minute squares, the assessment of impacts is essentially unchanged.

5.6.1 Impacts on Sea Scallops

From the available data we conclude that the proposed project at this site will have no negative impacts on the sea scallop fishery. NMFS survey and port interview data indicates that small amounts of scallops have been present at the enhancement site. As reported, between 1983 and 1993 six pounds of scallop meats were landed from the ten minute square in which the site is located, in 1983. Information collected during interviews with fishermen show that the two ten minute squares just south of the site have accounted for scallop catches of 46,647 and 18,825 pounds of meats during the same time period. Annual landings of interviewed trips from these two neighboring squares has fluctuated from zero to 12,059 pounds of meats.

Sea scallops will be harvested from off-site locations and released within the project area, either directly onto the bottom or into cages/nets. These scallops will range in size from 35-65 mm, a size range normally discarded in the fishery. We do not expect the mortality in these scallops to be any higher than if they remained at their original location of capture where they would be exposed to intense harvesting pressure. The potential for disease or pathogen transfer is non-existent as the scallops will be from the same stock native to the area. In addition, the scallops will be routinely monitored and samples taken for testing to determine causes of mortality and general condition.

Stocking density could pose a problem but this is considered unlikely since scallops will be broadcast into water depths of approximately 100 feet and should disperse naturally as they settle to the bottom. Also, scallops are fairly motile and should spread out as necessary. If stocking density did become a problem, it would be

identified during periodic dive or video monitoring.

5.6.2 Impacts on Groundfish

The proposed action will have no negative impacts on groundfish stocks. The site will be closed to towed fishing gear and thus may have positive biological benefits. The effects of this project to the benthic environment should be minimal. Any disturbance to the benthos should be significantly less than if the site were open to towed gear.

5.6.3 Impacts on Lobsters

The proposed action will have no negative impacts on lobsters. The site will be closed to towed fishing gear, except for some limited experimental tows, and thus should provide a refuge for lobsters for the duration of the experimental closure. The effects of lobster predation on small scallops is unclear but should be determined during the experimental period.

5.6.4 Impacts on Endangered and Threatened Species

The proposed site is not known for concentrations of marine mammals or turtles. Whales migrating through the area may be adults with calves heading for the protection and seasonally abundant food resources of Cape Cod Bay. Protecting females with calves during their vulnerable springtime breeding period is particularly important in furthering the recovery of several populations of endangered whales. Juvenile and sub-adult loggerhead, green, and Kemp's Ridley turtles prefer warmer water and are most likely to be in the area from mid-summer through fall.

Whales and turtles are known to become entangled in lobster pot lines, seines and fish weirs. Right whales are particularly vulnerable to entanglement in lines because of their propensity for surface feeding. Leatherback sea turtles are also commonly caught in lobster trap lines because they lack sufficient maneuverability to free themselves.

The threat of entanglement in the buoyed lines used to delineate each lane as well as the lines supporting the suspended cage array is the foremost concern for all species involved. The concentration of scallops within the lanes may attract loggerhead turtles which are known to feed on mollusks and crustaceans. Green, Kemp's Ridley, and leatherback sea turtles are less likely to be attracted to the site since their primary food sources are sea grass and algae, crabs and jellyfish, respectively. The grow-out lanes and the suspended cage array system should pose little risk to the endangered species mentioned above as long as the number of lines to the surface does not exceed what has been proposed.

The off-bottom grow-out array is a substantial arrangement of floating and suspended gear, however, the taut mooring system planned and the weight of the grow-out modules will place all lines in the system under tension. Unlike slack lines which can become entangled on flukes and flippers, this array presents significantly less risk.

The proposed action is not likely to adversely affect endangered species under the

jurisdiction of the NMFS because: 1) the site is not a known concentration area for the species of concern, and 2) the expected impact from the structures associated with the grow-out lanes and the cage array should be minimal in a pilot project of this size and duration.

5.7 Economic Impacts of the Proposed Action

This alternative would close an area to certain types of fishing gear under the Atlantic Sea Scallop FMP for experimental use by the Westport Scallop Corporation. The designation would allow lobster pot fisheries as well as recreational and commercial hook-and-line fisheries to continue operations within the site boundaries and within prescribed distances from both the grow-out array and bottom cages. Towed mobile gear, gillnetting, and any scallop harvesting by non-participating vessels or researchers would be prohibited for the duration of the experiment.

This alternative would have a negligible impact on overall landings. The proposed nine square-mile site constitutes 0.012 percent of the approximately 72,000 square miles of potential commercial fishing area in the Northeast. The amount of fish landed commercially from the site is small compared to total commercial landings in the region. As detailed in other sections, the site is reported to have produced an average of one hundredth of a percent of the cod and three hundredths of a percent of the winter flounder caught between 1985 and 1991.

The low level of fishing activity within the experimental area was one of several selection criteria used by the project team. Analyses were performed on the basis of existing NMFS data and in cooperation with area fishermen. To date, this constitutes the project proponents' best efforts to minimize the impact of the proposed restrictions.

Benefits - The proposed project does not provide a blanket exclusion for activities that might be incompatible with the requirements of the experiment. Instead, the proposal identifies specific activities that are compatible with project operations, allowing for a maximum level of commercial and recreational fishing activity while insuring consistency with the goals and objectives of the experiment. The closure, with some exceptions, strikes a workable balance between the requirements of the experiment and the desire to maintain the maximum permissible fishing effort in the designated area.

Because of the non-proprietary nature of the experiment and its results, the data generated and conclusions drawn from attainment of the project's objectives have the potential to deliver valuable short and long-term returns to fishermen from the region. These returns range from advances in applied technologies and biology to increased economic opportunities for both the small and offshore fleets.

Costs - The conditions necessary to ensure the integrity of the project and confidence in its conclusions are not incompatible with all present users. The ability to specify activities that would compromise the project's scientific integrity minimizes the costs to present users while at the same time allowing research to proceed.
Some current uses of the site by mobile gear operators, gillnet fishermen and

scallopers will be affected during the eighteen-month period of the experiment. Estimates of impacts are difficult to project given the large size of the statistical blocks utilized by the National Marine Fisheries Service to calculate landings. Based on discussions with area fishermen, these activities are believed to consist of some scalloping activity on the western side of the experimental area and some groundfish dragging and gillnet activity on the eastern side of the experimental area. In economic terms, estimates in lost revenue due to the loss of groundfish catch from the nine square-mile site is approximately $6,000 based on 1985 to 1991 NMFS landing statistics for cod and winter flounder. This figure is offset by the benefits accrued by participating vessels that will be compensated for their participation in the program through the harvesting and sale of scallops in their respective grow-out lanes at the conclusion of the experiment. Groundfish will remain vulnerable to towed gear if they leave the experimental site, although hook fishing at the site will continue to yield groundfish revenues.

There are also administrative and enforcement costs associated with an area closure. When full implementation of the Vessel Tracking System (VTS) now required by the FMP occurs, however, enforcement of scallop vessel entry into the site will be simplified.

5.7.1 Economic Impacts of Other Alternatives

No Action Alternative

Benefits - Maintaining the status quo will allow all managed and unmanaged fisheries to continue operations in the proposed experimental area subject only to current reporting requirements, days-at-sea allowances, gear restrictions or other regulatory requirements. Economic benefits derived from fishing at the proposed site would continue. These benefits are modest as shown in Table 1 which presents estimated annual landings from the experimental area as a percentage of overall landings. In this analysis we have assumed the catch from the 9 square-mile experimental area is 9% of the yield from the 100 square mile reporting area that encompasses the experimental site.

	10 minute block		3 minute block		N.E. total catch		Percent	
year	cod (lbs)	winter flounder (lbs)	cod (lbs)	winter flounder (lbs)	cod (1000 lbs)	winter flounder (1000 lbs)	cod	winter flounder
1985	18,181	36,733	1636.3	3306.0	30,203	7,937	0.005	0.042
1986	11,416	11,712	1027.4	1054.1	26,676	3,527	0.004	0.030
1987	35,410	35,898	3186.9	3230.8	22,266	6,834	0.014	0.047
1988	34,362	21,429	3092.6	1928.6	24,251	5,071	0.013	0.038
1989	20,643	4,126	1857.9	371.3	32,187	4,630	0.006	0.008
1990	56,263	5,584	5063.7	502.6	41,226	3,307	0.012	0.015
1991	60,207	6,641	5418.6	597.7	44,753	2,425	0.012	0.025
Avg.	33,783	17,446	3,040	1,570	31,652	4,819	0.009	0.029

Table 1. *Cod and winter flounder caught in the experimental area as a percentage of overall catch in the Northeast*

Mobile and fixed gear users will have continued opportunities to harvest inside and transit the proposed experimental area. There would be no new benefits to fishermen associated with the No Action Alternative since the Sea Scallop Enhancement Project would not be conducted in the absence of restrictions to protect the scientific integrity of the project. There would be some savings of enforcement and administrative costs under this alternative.

Costs - The proponents are not aware of any methodology or procedure that would allow research and experimentation with commercial-scale sea scallop aquaculture and enhancement without restraining open-access conditions. In order to conduct experiments which could lead to an expanded sea scallop resource base in the region, it is necessary that the proponents have the ability to observe, monitor and record fundamental ecological processes, mortalities, dispersions and growth with as few external variables as possible. The Sea Scallop FMP currently allows activities in the experimental area that would be inconsistent with the purposes of the project.

In order for the Sea Scallop Enhancement Project to occur at any site that might be identified, certain minimum conditions must exist. Foremost among these conditions is protection of the site's suspended grow-out array, the grow-out lanes, spat collectors and bottom cages from interference. Growth trials and monitoring of scallop culture and change would be virtually impossible under the No Action Alternative. One of the critical hypotheses to be tested is that growth rates will increase when the seeded scallops are free from the effects of repeated dredging. Specifically, the No Action Alternative would prevent accurate and reliable data collection to test the carrying capacity of the grow-out lanes as well as sediment sampling, measuring scallop mobility, identifying predators, and maintenance of the apparatus. The presence of unrelated mobile gear and gillnets within the area would compromise nearly all aspects of the experiment.

Due to the fact that bottom cages for sea scallop grow-out, spat collectors, and the suspended mid-column sea scallop grow-out array can not accommodate fishing with towed gear and gillnetting activity, there is a need to minimize the number of potentially detrimental interactions at the site. The high probability of negative interactions would argue against the No Action Alternative.

The No Action Alternative would result in losses to the research team and to the individual vessel operators who choose to explore the opportunities associated with sea scallop enhancement and aquaculture as supplements to their existing wild harvests.

No Action over the long term would discourage or delay the development of both the scientific and engineering aspects of sea scallop husbandry and enhancement. Based on the economic benefits enjoyed by other nations that have adopted scallop culture and enhancement techniques, the potential benefits to the Northeast could be in the hundreds of millions of dollars in landed sea scallops within a decade.

Exclusive Use Alternative

Benefits - The Exclusive Use Alternative would greatly reduce potentially disruptive or harmful interactions and ensure unencumbered access to the site for the researchers and participating vessels. By reducing the number of potentially negative interactions, control conditions could be better approximated. Researchers would be able to better monitor and analyze interactions between other animals in the area and the sea scallop enhancement activities without the complication and distortion of continued commercial harvests of non-target species. This alternative would significantly improve the demonstration project's likelihood of success.

Costs - The Exclusive Use Alternative, while providing the maximum protection for the experiment relative to interactions with existing competing uses, would impose economic costs and disrupt the activities of other users who have traditionally fished in the experimental area. Exclusive use would be unnecessarily broad, overly burdensome on some fisheries and difficult to enforce.

While the ability to access the experimental hardware, conduct tests and monitor results would improve under this alternative, these activities can be conducted adequately under conditions set forth under the Preferred Alternative. An analysis of the ability of wild fisheries and aquaculture to coexist in designated areas is an intended outcome of the proposed experiment. Exclusive use of the proposed site would be inconsistent with that goal.

Given the size of the proposed experimental area, the short duration of the project and the present level of fishing activity at the proposed site, the impacts on existing fisheries operating there would be minimal. Although the economic benefits presently derived from the site are relatively small, there is a need to minimize social and economic impacts on existing fisheries to the maximum degree practicable.

5.7.2 Economic Impacts on Scallopers

No significant impact are expected to affect the commercial scallop fleet landings due to the 18-month closure of this site to commercially towed gear. As stated earlier, insignificant amounts of scallops are currently harvested from the experimental area.

The scallops to be collected from commercial grounds for seeding would very small and likely uneconomical to shuck. As such, they represent no short-term loss to the scallop fleet. Increases in size and value of the seeded scallops will represent increased revenues to the scallopers who originally caught them and placed them in their designated lane.

Long-term gains, based on project results, are incalculable at this time but may be substantial. Each 1/4 mile by 2-1/2 mile lane has 22.5 million square feet. Even a modest stocking density of one scallop every 10 square feet would allow the placement 2.25 million seed scallops per lane. In Japan, a seeding density of two scallops per square foot is not uncommon. If moderate increases in growth rates of the seeded scallops can be coupled with substantial reductions in dredge-related mortalities, significant economic benefits may be realized.

5.7.3 Economic Impacts on Other Fisheries

The proposed action should have few negative economic impact on most fixed gear fisheries since these activities would continue to be allowed in the experimental area. There is some concern on the part of lobstermen fishing near the area that the site may attract large scallop vessels and result in increased gear conflicts. The proponents plan to use peer pressure and public awareness of the project's purpose to minimize, address and possibly even reduce this type of occurrence.

The most significant economic impact may be to trawl vessels fishing for winter flounder or cod. Information gathered through interviews with fishermen (Table 2) confirm at least a moderate catch of these species from the ten-minute square which encompasses the proposed site. Landings are significantly lower at the project site than those attributed to the ten-minute squares directly south of the project.

	41-15'N x 70-35'W		41-05'N x 70-35'W		41-05'N x 70-45'W	
year	cod (lbs)	wf (lbs)	cod (lbs)	wf (lbs)	cod (lbs)	wf (lbs)
1985	18,181	36,733	7,344	51,968	25,824	128,137
1986	11,416	11,712	14,228	26,937	9,904	56,264
1987	35,410	35,898	21,065	13,219	54,665	62,236
1988	34,362	21,429	80,775	44,637	56,705	39,759
1989	20,643	4,126	114,619	28,164	115,337	22,148
1990	56,263	5,584	34,063	15,003	56,850	22,155
1991	60,207	6,641	21,676	27,212	34,183	47,103
1992	28,672	9,251	47,535	55,979	68,875	61,697
1993	5,241	13,226	1,160	13,493	5,857	16,080
Avg.	30,044	16,067	38,052	30,735	47,578	50,620

Table 2. Cod and winter flounder caught in the ten-minute square containing the experimental area and two squares to the south

Since the experimental area is only nine-percent of the ten-minute square reported above, the actual effect of the proposed closure would presumably be proportionally smaller.

5.7.4 Distribution of Economic Impacts

Lobstermen may benefit from the proposed action. Lobsters normally taken by mobile gear at the site would only be available to trap fishermen during the term of the experiment. Small vessels using hooks for cod may also benefit because of their access to the project area.

The enhanced growth and reduced mortality of the scallops placed at the site may increase the revenues of the participating vessels when seeded scallops are harvested at the end of the project. Revenues for these boats may be higher than for non-participating vessels that would have had the opportunity to recapture those animals. This effect is difficult to quantify because of questions about dredge-induced mortality on commercial scallop grounds. Alternatively, revenues to the

participants may not adequately compensate them for their time, fuel and other expenses associated with their involvement in the project. More likely, the proposed action will have a short-term negative economic impact because they are not engaged in commercial fishing while participating in the experiment. In the long-term, all benefits should be equally available to all fishermen due to the non-proprietary nature of the proposed action.

5.7.5 Cost/Benefit Conclusion

In the aftermath of recent reductions in effort in New England's wild fisheries, there is an increasing need to advance understanding and collect data on the viability of commercial-scale sea scallop culture techniques. The ability to conduct sea trials in a relatively low-use area away from the crowded, and possibly-polluted coastal zone will advance our knowledge of the possibilities that exist in an exposed marine environment.

The proposed project is non-proprietary and cooperative in nature and is 18 months in duration. It will have a negligible impact on the site and will advance our understanding of culturing systems and scallop morphology. The benefits of conducting trials under the Sea Scallop Experimental Area Alternative may produce results that could potentially increase sea scallop production and revenues for regional coastal communities.

Other potential long-term benefits from the experiment include increasing the ability to sustain commercial yields during negative fluctuations in wild stocks. The experiment also will test the potential and cost effectiveness of "re-seeding" depleted areas such as George's Bank through seed transfer. Potential long-term benefits would appear to far outweigh any short-term economic impacts resulting from the area closure. There are no anticipated long-term economic costs associated with this alternative.

Under the Sea Scallop Experimental Area Alternative, existing data reporting requirements would remain in place. The adoption of this alternative would not impose any additional reporting requirements on fishermen at the proposed site. Under this alternative, the project team will work cooperatively with fishermen allowed in the area to develop data important to the understanding of potential interspecies interactions and effects.

It should be noted that the proposed project is not a private venture which seeks long-term exclusive use of the site or the introduction of non-native scallop species that may require additional feed or antibiotics. To the contrary, this public domain research project is directed exclusively at the enhancement of a native, planktonic-feeding species. There would be no significant impact on the proposed site after the experiment is terminated.

5.8 Social Impacts of the Proposed Action

The Council does not anticipate any significant negative social impacts in the short term as a result of this experiment. Although the preferred alternative does impose additional restrictions on some gear types for an eighteen-month period, fishing history at the experimental site indicates limited use. The long-term positive social

impacts of the project, on the other hand, could be significant. The Sea Scallop Enhancement Project could break new ground in the understanding of sea scallop culture on a commercial scale and on the ability to re-seed depleted areas with transferred stock. The project has the potential for stabilizing and expanding commercial production, increasing jobs, strengthening the economic base of those communities that depend on the sea scallop and other regional fisheries. This could improve the long-term social welfare of all components of the industry connected to sea scallop production.

The project also provides some social benefits by developing a relationship between the harvesting sector and the scientific community for their mutual benefit. A successful experience could help to promote similar positive working relationships within the fishing community.

5.9 Finding of No Significant Impact (FONSI)

NOAA Administrative Order 216-6 provides guidance for the determination of the significance of the impacts of fishery management plans and amendments. The five criteria to be considered are as follows.

1. *Can the proposed action be reasonably expected to jeopardize the long-term productive capability of any stocks that may be affected by the action?*

The principal objective of this amendment is to enhance sea scallop stocks in both the short term and in the long term. The project seeks to do this by developing sustainable methods of sea scallop production and demonstrate those methods to current participants in the sea scallop fishery. The project will not introduce non-native species, supplemental feed, or medications. The site for the experiment has been selected specifically and the project has been designed to reduce the impacts on any currently important fisheries. The amendment will have a neutral to slightly beneficial impact in the short term and no impact in the long term on other stocks that might be affected by the temporary closure.

2. *Can the proposed activity be reasonably expected to allow substantial damage to the ocean and coastal environments?*

The sustainable techniques that will be developed during the project include reducing the practice of repeatedly harvesting sea scallops during their growth. This will reduce the potentially-damaging impact of scallop dredges on the site and the sea scallops and other biota that dwell there. In the long term, the goal of the project is to impart a conservation and substainability ethic within the sea scallop industry resulting in a stewardship of the ocean resources.

The project will be deploying equipment and growout cages that, in the event of a failure or unanticipated conditions, might become lost. There is a chance that such gear losses could reach the beaches of Martha's Vineyard, southern Massachusetts or Rhode Island. Such an event would not cause long term impact or damage. The project team has the technical and monitoring capability to respond adequately to these contingencies.

3. *Can the proposed activity be reasonably expected to have an adverse impact on public health or safety?*

A goal of the project is the development of sustainable methods for the production of high-quality sea scallops. Features of this approach include the ability to plan harvests of monitored "crops" of sea scallops with more efficiency and less dependence on long trips. A higher-quality, safer product will result.

4. *Can the proposed action be reasonably expected to have an adverse impact on endangered or threatened species or a marine mammal population?*

The proponents of the project factored in the fact that endangered or threatened species and marine mammals are only seldom sighted in the proposed area, and then only transiting. The proposed area is not a known feeding, breeding, or calving area for these species. In addition, the gear that is proposed for the project is small and discrete, offering little chance for entanglements. These potential for interactions are not different in kind or degree from the existing situation. The National Marine Fisheries Service has reviewed the project and their conclusions are quoted in section 5.4.1.

5. *Can the proposed action be reasonably expected to result in the cumulative adverse effects that could have a substantial effect on the target resource species or any related stocks that may be affected?*

The proposed action is intended to facilitate a project with the goal of increasing the biological productivity of sea scallops through the introduction and demonstration of sustainable practices. As explained in the background section, other countries have seen greatly increased stock strengths through the adoption of some of the practices that will be used in the experimental project. If the project is successful there will be a cumulative benefit to the target resource. Because of the short-term nature of the project, even if it fails it is not expected to have any permanent or cumulative adverse effects.

The guidelines on the determination of significance also identify two other factors to be considered: degree of controversy and socio-economic effects. The socio-economic impacts of the proposed action are discussed above and are not considered significant in the short term. Over the long term, the project is expected to have a positive contribution on the economic and social situation in the region's fisheries.

The location of the proposed special management area has been debated during the presentations to the various Council species committees, to the Council itself, and during public hearing. some of the specific comments brought up during these debates have resulted in modifications to the project plans to both accommodate other user groups and add to the overall value of the project. On balance, the degree of controversy has been minimal considering the unprecedented nature of the plan. Most fishermen agree that the potential information to be gained from the planned research outweighs any anticipated temporary hardships.

The issue of privatizing the bottom through long-term commercial leasing is controversial and deserving of full Council debate. However, this project is not such an initiative. The public nature of the planned research, the broad and open level of industry participation, and the short-term nature of this action separates it from the larger issue of privatization.

According to NAO 216-6, no action should be deemed significant solely on the basis of its controversial nature, but the degree of controversy should be considered if determining the level of analysis needed to comply with NEPA regulations. Based on this guidance and the evaluation of the preceding criteria, the Council proposes a finding of no significant impact.

FONSI Statement
In view of the analysis presented in this document, it is hereby determined that the proposed action would not significantly affect the quality of the human environment with specific reference to the criteria contained in NDM 02-10 implementing the National Environmental Policy Act. Accordingly, the preparation of a Supplemental Environmental Impact Statement for this proposed action is not necessary.

_____ _____

Assistant Administrator for Fisheries Date

6.0 Applicable Law

6.1 Magnuson Fishery Conservation and Management Act

Consistency with National Standards

Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.

This amendment seeks to implement an experimental area for the purpose of developing sustainable sea scallop fishing methods. As explained in the background section, in Japan, the harvest of sea scallops has become stable from year to year, and is an order of magnitude larger than it was before sustainable practices and culturing techniques were introduced. Currently, the Atlantic sea scallop fishery is in a downward trend which the planned project hopes to reverse through conservation and husbandry.

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

The proponents of the project have based their experimental plans and selected the enhancement area based on the best scientific information available. These include extensive investigations of the scientific literature on sea scallop enhancement and culturing techniques. It also is based on abundance surveys of the site and its neighboring area and on landing data supplied by commercial fishermen.

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

The experimental plans to be carried out during the planned project will determine the suitability of a variety of techniques that could be used to improve the sustainability of sea scalloping. These methods could have applicability throughout the range of Atlantic sea scallops. Some of the techniques have already been demonstrated as successful in the Canadian Maritimes on the same stock of sea scallops.

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

Results of the proposed research will be applicable to all states where sea scallops are found. For the short-term, fishermen from Massachusetts who have traditionally had free access to the proposed site will be affected. They will, however, be in the best position to benefit from the knowledge that is gained from the project. The project results will be disseminated widely and the participants in the project are providing substantial in-kind support to the project in order to be involved. The project is as broad-based as possible within the limits of the scientific requirements. In addition, the project is of short duration.

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

The proposed action is in support of a project aimed at promoting sustainability and efficiency in the sea scallop fishery. By identifying and demonstrating culturing and enhancement techniques, the productivity of the sea scallop industry will be improved along with its efficiency.

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

The proponents of the planned project have included a range of experimental measures to best identify productivity and sustainability increasing methods. Even if some of the planned approach fail to meet their goals, other aspects of the project will be unaffected. The project plan allows for responding to contingencies to maximize the overall benefit that can be expected from the project given its short-term duration.

The choice of the experimental area was based on scientific data revealing local variations in catch levels and presumably variations in local abundance of resources.

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

This proposed action is without precedent and does not duplicate any other regulations or plans. The proposed experimental area was developed and specified in order to maximize the value from the planned program of research. No other research of this nature has been proposed in this region or in the U.S.

6.2 National Environmental Policy Act (NEPA)

There are no economic and social impacts from this action beyond those identified and discussed in the Environment Assessment contained above. The FONSI recommended by this amendment satisfies the obligations set forth by NEPA.

6.3 National Aquaculture Policy, Planning, and Development Act (NAA)

Establishment of a closure under this amendment will further the purposes of the National Aquaculture Act which specifically seeks to extend and encourage these types of activities.

6.4 Regulatory Impact Review

This section provides the information necessary for the Secretary of Commerce to address the requirements of Executive Order 12866, the Regulatory Flexibility Act and the National Environmental Policy Act. The purpose and need for management (statement of the problem) is described earlier in this document. Alternative management measures to the proposed regulatory action are described on page 14. The economic and social impact analysis begins on page 15 and is summarized below. Other elements of the Regulatory Impact Review are included below.

For the purpose of the Regulatory Impact Review the proposed action is compared to the No Action Alternative. The goal of the Council is to allow this project to take place under conditions that would otherwise not exist without the proposed action. The long-term economic and social impacts of the proposed action are positive and the program has been designed and the site selected in a manner than minimizes the potential for short-term negative economic or social impacts.

6.5 Executive Order 12866

The proposed action does not constitute a significant regulatory action under Executive Order 12866. (1) It will not have an annual effect on the economy of more than $100 million. (2) Because of the limited scope of the action and the finite duration it will not adversely affect in a material way the economy, productivity, competition and jobs. (3) It will not affect competition, jobs, the environment,

public health or safety, or state, local or tribal governments and communities. (4) The proposed action will not create an 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 this fishery. (5) The proposed action will not materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of their recipients. (6) The proposed action does not raise novel legal or policy issues. Area closures have long been used to manage fisheries in the Northeast

6.6 Regulatory Flexibility Act

The sea scallop fishery in the Northeast is composed of small business entities operating primarily out of southern New England ports. There were 245 scallop vessels that were issued full-time permits in 1994. Additionally, 53 vessels were issued part-time permits and 30 were issued permits in the "occasional" category. Approximately 8 vessels would participate in the planned project and the remainder would not be allowed to fish in the enhancement area during the duration of this proposed action. As planned, all other participants in the scallop fishery will have access to the results of the research.

The proposed action will not affect a significant number of small business entities since the proposed enhancement site is not a productive location for scalloping. It will not increase costs for small entities, compared to large entities because all scalloping operations are small entities. The proposed action therefore will not have a significant economic impact on a substantial number of small business entities and a Regulatory Flexibility Analysis is not required.

6.7 Marine Mammal Protection Act and Endangered Species Acts

The proposed site is not a known concentration area for marine mammals or turtles. Whales migrating through the area may be adults with calves heading for the protection and seasonally abundant food resources of Cape Cod Bay. Juvenile and sub-adult loggerhead, green, and Kemp's Ridley sea turtles prefer warmer water and are most likely to be in the area from mid-summer through fall.

The grow-out lanes and the suspended cage array system should pose little risk to the endangered species mentioned above as long as the number of lines to the surface does not exceed what has been proposed.

The proposed action is not likely to adversely affect endangered species under the jurisdiction of the NMFS because: 1) the site is not a known concentration area for the species of concern; and 2) the expected impact from the structures associated with the grow-out lanes and the cage array should be minimal in a pilot project of this size and duration.

6.8 Coastal Zone Management Act (CZMA)

See Volume I of Amendment #4 and Supplemental Environmental Impact Statement to the Sea Scallop FMP, dated July 1993, Section X, page 155 and its

Appendix XI, for consistency statements regarding scallop regulations and coastal zone management plans. This amendment does not change the conclusions of that analysis.

6.9 Paperwork Reduction Act (PRA)

Copies of the PRA analysis for this amendment to the Sea Scallop FMP are available from the NMFS Regional Office, Gloucester, Massachusetts. This amendment does not contain a collection of information requirement for purposes of the PRA.

Appendix I.
References

References

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Appendix II.
Public Comments

Responses to Comments Provided at a Public Hearing Held on January 191, 1996

Comment: Seven organizations and several individuals expressed support for the specific project and the concept of sea scallop enhancement through experimental areas. The appropriateness of the project and its economic potential was cited.

Response: The project was initiated as a broad-based, industry-driven effort. A variety of culture and enhancement techniques are planned with the scallop industry fully involved in the carrying out of the project.

Comment: Several individuals felt that no matter where the project was sited, there would be competing uses that would strongly oppose the project and suggest it be moved. They encouraged the Council to allow the project to proceed as proposed.

Response: The project proponents sought to minimize user conflicts in locating the nine-square-mile site.

Comment: Two individuals stated that the concern over displaced fishing activity is misguided. Both lobstering and hook fishing will be allowed in the experimental area.

Response: The proposed experimental area prohibits only mobile gear and gill nets due to their incompatibility with the planned experimental activity.

Comment: One association expressed the need for compromise and that the project needs to factor in the economic concerns of lobster fishermen before proceeding with any projects.

Response: The proponents have included an element in the project that would fold in lobster fishermen as participants. There are also plans to schedule project activities to minimize impacts on lobster fishermen and hook fishermen. Meetings will be held and communication means will be developed to address these issues.

Comment: The proposed site is in the middle of an existing lobster fishery.

Response: The proposed site is not in the middle of an existing lobster area, but on the eastern edge of an area fished by the local lobster fleet. Lobster fishing takes place in virtually all waters of the continental shelf from New Jersey to Canada, so only from this perspective, the project site is in the middle of the lobster fishery. The public comments indicate that five lobstermen fish 1,500 traps in the general geographic area of the proposed site (not in the site alone). In comparison, there are over three million traps being fished in U.S. waters by more than 10,000 fishermen. One lobsterman who has expressed concern has indicated that most of his traps are to the west of the proposed site.

Lobstering is an allowed activity within the project site. The prohibition of towed gear in the site gives added protection to the lobstermen fishing within the site and may also result in increased catches of lobsters. One key aspect of the proposed project is to demonstrate that wild capture lobster fisheries and aquaculture can coexist side by side.

Comment: The stocking of scallops in the site will attract commercial scallop dredge boats to the area and increase gear conflict.

Response: A 1,500-foot buffer zone is included within the proposed site. This should prevent the migration of scallops into areas where they would be vulnerable to commercial harvest. In addition, the amount of seed to be stocked, the size of the seed, and the location of seed placement within the site will make it highly unlikely that commercial quantities of scallops, ones that can be retained by legal 3.5" ring size gear, would end up outside of the site. It is highly unlikely that scallop vessels would be attracted to the surrounding area, for the purposes of profitably harvesting seeded scallops. The public comment indicates that occasionally scallop vessels are attracted to the area to make "shack" tows for lobster on their way home. If that is the case, this project will not alter that situation outside of the site. In the long-term, if this project demonstrates a passive gear technology to produce scallops, the gear conflict problem that currently exists will be solved.

Comment: Public grounds should not be handed over to private control.

Response: Public grounds are not being handed over to private control. A publicly funded project will be conducted in a specially-designated area as defined by a public Amendment to a Fishery Management Plan for a limited time period. Certain controls will be place on some users of the area in order to maximize the public benefit. No permanent rights or interests are being created. All information collected will be available to the public.

Comment: One individual and one organization expressed concern that the catch statistics were suspect since they indicated increased cod landings in the general area.

Response: The data use for comparing the relative catch is the best data available from NMFS. It is supplied by fishermen and used as a factor in fisheries management. The fact that the data indicates a local increase in cod catch in the face of regional declines is not an indicator that it is invalid.

Comment: This area has had a significant cod fishery.

Response: New England has had a significant cod fishery. The fishery is depressed now and the industry that was dependent on cod may vanish unless we try out new ideas. The best scientific data, as presented in the amendment, indicates that the proposed site was not a significant contributor to the cod fishery. Even so, hook gear will be allowed in the site which should give the small traditional coastal vessels an advantage over large draggers that will not be permitted into the site with towed gear. One commenter indicated that 500,000 pounds of cod were taken from this area

by longline vessels which will remain a permitted activity. The commenter also claimed large numbers of small draggers have also worked the area harvesting illegal sized cod. (13-15 inches).

Comment: The site should be shifted south.

Response: All scientific evidence indicates that there are significantly more vessels harvesting significantly more fish and scallops from the areas south and west of the proposed site. In addition, the further we move the site offshore and into deeper water, the more difficult it would be to conduct the controlled experimental activities. This particular site is of great scientific and practical interest because we know it can support scallops but traditionally does not. The best available scientific data shows that most traditional and historic use patterns of most fisheries are to the south and west of the proposed site.

Appendix III.
Written Comments

SEAREACH

3 1/2 South Main St, P.O. Box 900, Ipswich, Mass 01938, ph 508-356-1785 (fx 3534)

MEMORANDUM

January 21, 1996

TO: NEW ENGLAND FISHERIES MANAGEMENT COUNCIL
5 BROADWAY
SAUGUS, MASS 01906-1097
FROM: G.G. CAMPBELL, SEAREACH/CONSENSUS MANAGEMENT, INC.
SUBJECT: EXPERIMENTAL AQUACULTURE SITE, SOUTH OF MARTHA'S VINEYARD

GENTLEMEN AND LADIES;

I am writing to you with respect to the Westport Sea Scallop project. I am urging your support of this effort as an exciting approach to an otherwise untapped industry in the New England area- sea scallop spat collection grow-out. What the New England Fishing Industry needs right now is a shot in the arm to re-invent itself, redirect its efforts, to re-engineer its efforts towards the building of a future, rather than the rethinking and remorse for the past. Sure aquaculture does not provide for a direct replacement of the natural fisheries, or even a necessarily acceptable alternative to the fishing/hunting nature of the natural fisheries, but it does provide for a positive direction in which the industry could go to enhance the existing natural fisheries- whether the fishermen and existing offshore industry chooses to go in this direction or not.

Furthermore, aquaculture provides us all with an opportunity to rethink how we are preparing our natural resource plans within this country, and in particular, the Northeast. The Management Council direction of preparing management plans for individual species, assessing impacts, then bringing the plans before a Management Council Committee, then public and interest groups to review, and then for the full Council to pass on has not entirely worked. By the time the regulations get out, in this manner of Council review and adjustment, the plans get watered down, and in many cases unworkable. What is well needed at this point in the management of our valuable fisheries is more of a bottom-up approach to management where the fishermen, and the industry as a whole, have a direct say, and certain incentive, in making their own management and development plans. I believe that unless they have their own say in structuring their own plans, that there will be absolutely no incentive for them to buy into the final plan.

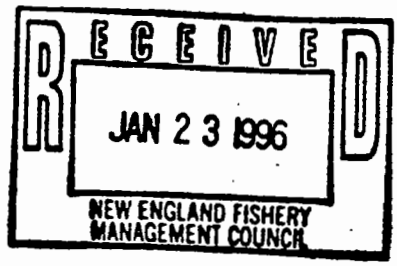
Aquaculture provides us with just this opportunity to accomplish this in a creative and decisive manner. Unless a final plan is prepared, however, joining development and conservation- the plan will be lopsided. Unless a final plan is prepared with the entire industry, the plan has no chance of succeeding. Unless you know where you are going, how are you going to get there from here !! The BLUEPRINT FOR SEA SCALLOP AQUACULTURE IN MASSACHUSETTS forum this past summer at the Cape Cod Community College provides us with just that kind of foundation or Vision with where we should go with sea scallop development and conservation within the State. This very demonstration project came out of that conference.

Because this was an industry approach to a combined conservation and development plan (with industry, fishermen, community, regulators, legislators, and the general public's input), the plan should have about the most validity it can get- the validity of public/industry CONSENSUS. Because of this, the plan should be approved by the Council.

The fact that several fishermen and lobstermen have come forward is good- they can provide a final input into where the final plot is located, and become part of the process rather than act as outsiders. The fact of the matter is that we do now know where we are going, at least within the State of Massachusetts with respect to further sea scallop development and protection. The weight of this direction, and the fact that the decision was bought into by many interest groups and the industry itself, should be the deciding factor for approval of this sea scallop plan. Manangement plans can no longer have the luxury of piecemeal decision-making- a one step at a time approach- we need the comprehensiveness that this plan presents, as well its long-range benefits.

NANTUCKET SOUND
FISH WEIRS, INC.
TRAP FISH

January 19, 1996



New England Fishery Management Council
5 Broadway
Saugus, MA 01906-1097

Re: Experimental aquaculture site south of Martha's Vineyard

Gentlemen and Ladies:

I urge you to approve the proposal to establish an experimental aquaculture site. The Westport sea scallop effort is as near perfect an opportunity for the council as will exist or could be desired.

Why? Because this project:

*Is of limited duration.

*Will assist NEFMC in determining their future role in aquaculture.

*Can lead to establishing a permitting process for federal waters.

*Includes responsible individuals well known to the industry.

*Begins the development of an industry with significant economic potential.

At the 1/19/96 public hearing only one of the speakers opposed to the experiment presently lobsters in the area. Others critics included one fishermen who occasionally tows at this site, and a few former fishermen who had knowledge of harvesting activities south of the Vineyard when they were active.

The small collection of opponents acknowledged that a successful informal agreement presently exists among users of the project area. It seems logical that this understanding could include the sea scallop project for the eighteen month duration of the experiment. The applicants state lobstering can continue in the site during the experiment.

Lobster gear is found from the Mid-Atlantic region to Newfoundland and the interests of lobstermen and aquaculture are going to be a consideration in many future proposals. Any experience in addressing this issue will be valuable.

A variety of attitudes exist about the environmental effect of towed gear. This enhancement project will produce information regarding gear impact on the habitat.

Seed source is fundamental to sea scallop aquaculture. Spat collecting and hatcheries are presently being investigated. Using sea scallop "peanut piles" will reveal how transferring small scallops can affect mortality and growth rates. The proposal will evaluate seed collection as a source for enhancement and increase knowledge about scallop biology where densities are very high.

The Westport project provides the first step for the scallop industry to make the transition from traditional practices to sea farming. Please vote for this amendment to the management plan.

Sincerely,

MARK SIMONITSCH

84 Doane Road, Chatham, Massachusetts 02633
Wharf: 508-945-1791 • Fax: 508-945-9730 • Residence: 508-945-2496

J. Larsen
P.O. Box 121
Edgartown, MA.
02539

Jan, 21-1996

Dear Sir,

I am a lobsterman from Marthas Vineyard.

I have Fished The last 16 years in The area where the seascallop Enhancement projects Proposed site is located.

In The past we have had gear Conflict Problems with scallopers Making Shack tows in that Area.

Sometimes losing a hundred Traps or More in one Night.

the last two years weive had NO gear Conflict problems at all.

over The Past year I have and lobstermen from the vineyard have

attended some of the hearings To express our Concerns of Dumping seascallops loose over this site. That will most Definately spread out beyond the boundries of their Closed area. Thus giving the seascallopers a reason to take test Tows Through the areas on The outskirts of the proposed site. Where we lobster.

We are mostly small, one man boats.

This area is the outer most area we can fish and is quite productive.

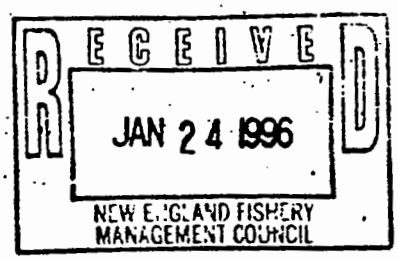
I am opposed to the Present Proposed location of their site. If they would move their site Ten miles to the South I'll support Their project 100%.

Sincerely,

(John A. Larsen) John A Larsen

RFD Box 201, Franklin Street
Vineyard Haven, MA 02568
(508) 693-4295

January 22, 1996



Douglas G. Marshall
Executive Director
N. E. Fishery Management Council
5 Broadway
Saugus, MA 01906

Dear Mr. Marshall:

I'm writing this letter in regard to the proposed experimental sea scallop propagation program south of Martha's Vineyard. Having just attended the Woods Hole public meeting, I want to re-itterate some points.

I'm a lobsterman who fishes in the proposed site, and also have long lined in the area. My biggest concern with the project is increased scalloper activity in surrounding waters. As stated by many at the meeting, this area is not a hot bed for scallops. Yet we have the occasional "shack tow" and occasional loss of gear as is. This project will undoubtedly increase experimental tows in the area by transiting scallopers. Scallops can and do move, so it only makes sense for them to tow the boundaries, which would be a disaster.

One solution to this would be to buffer the 3-square mile project area with a scallop dredging closure. This area would only need to be large enough to dissuade experimental tows.

With a closure in place I think my fishing operation could be compatable with the project. Lobstering and scalloping don't mix, so without a scallop dredging closure I would very likely have to give up on the entire area.

In short, without a closure I would have to remain opposed to the project, even though I think it's a valid experiment.

Sincerely,

Scott Stephens

Biotechnology Center of Excellence Corporation
Nine Park Street
Boston, Massachusetts 02108-4807

(617) 727-7430
FAX: (617) 523-4165
E-MAIL: BCEC@DELPHI.COM

January 22, 1996

Mr. Douglas G. Marshall
Executive Director
New England Fisheries Management Council
5 Broadway
Saugus, MA 01906-1097

Dear Mr. Marshall:

I am writing in support of Amendment #6 to the Atlantic Sea Scallop Fishery Management Plan which allows for the establishment of a 9 square-mile site located 10 miles south of Martha's Vineyard to conduct an 18 month experiment and demonstration project involving sea scallop research and aquaculture.

This proposed demonstration effort can serve to showcase the many opportunities for new technology applications of commercial importance to the region and to Massachusetts. As you know, aquaculture activities throughout the nation have stimulated a rapid growth of instrumentation firms involved in water quality monitoring, pathogen detection, feed distribution and related software for control, record keeping and other applications.

You are aware of the economic development challenges facing Massachusetts. Our Centers of Excellence efforts have traditionally looked to emerging technology areas for continued generation of commercial activities and job creation. Studies we have carried out for the Department of Commerce in the area of marine electronics and aquaculture instrumentation have pointed to significant commercial opportunities which states like Massachusetts can pursue competitively. The proposed demonstration site will be an important resource for all of New England companies with current or potential interest in technology innovation.

The approval of Amendment #6 will be a positive step in this direction.

Sincerely,

Fernando Quezada
Executive Director

FQ/ll

Biotechnology Center of Excellence Corporation
Nine Park Street
Boston, Massachusetts 02108-4807

(617) 727-7430
FAX: (617) 523-4165
E-MAIL: BCEC@DELPHI.COM

January 22, 1996

Mr. Douglas G. Marshall
Executive Director
New England Fisheries Management Council
5 Broadway
Saugus, MA 01906-1097

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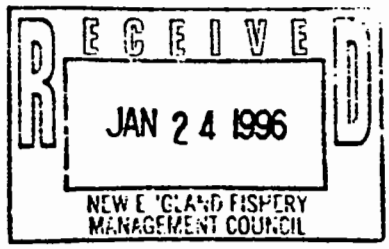
The approval of Amendment #6 will be a positive step in this direction.

Sincerely,

Fernando Quezada
Executive Director

FQ/ll

Roxane Ackerman
Church Street
Gay Head, MA 02535



January 1996

Mr. Douglas G. Marshall, Executive Director
New England Fishery Management Council
5 Broadway
Saugus, MA 01906-1097

Greetings Council Members:

I am a fisherman participating in a Fishing Industry Grant through the Martha's Vineyard Shellfish Group. We have supported the sea scallop aquaculture initiative in Massachusetts by hatching and growing thousands of sea scallops this past year.

I attended the hearing at the Woods Hole Oceanographic Institution on January 19, 1996. It is clear that a good sea scallop aquaculture proposal needs to be relocated in the interest of conserving the present fishing grounds which are not necessarily scallop habitat.

Success of the project at the present site would bring in scallop drags that would ruin lobster habitat, this is not necessary. It is clear that there is a good site available on scallop grounds nearby.

It is essential that we cooperate in the interest of preserving and rebuilding our fisheries. Thank you.

Sincerely,

Roxane Ackerman

Old Colony Planning Council

John G. Mather
President

70 School Street, Brockton, MA 02401-4097

Daniel M. Crane
Executive Director

Telephone: (508) 583-1833
Fax: (508) 559-8768

January 22, 1996

Mr. Douglas G. Marshall,
Executive Director
New England Fisheries Management Council
5 Broadway,
Saugus, Mass. 01906-1097

Dear Mr. Marshall:

The Old Colony Planning Council supports the proposed establishment of a 9 square mile site of off Martha's Vineyard for an 18 month sea scallop aquaculture demonstration project.

The Council shares the concerns of our coastal communities about the effects of diminished fish stocks and restricted fishing on the fisheries, and on the opportunities open to the regions's fishermen. For this reason we are working with the Town of Plymouth to explore the feasibility of various aquaculture opportunities in the town and in Southeastern Massachusetts generally. Recent programs by the Sea Scallop Working Group have shown the strong market for scallops and the possibility of raising them below the intertidal zone, thus avoiding conflicts with other shellfish activities and with upland land uses.

Yet labor costs remain high, lessening potential profits. This makes it necessary to develop new, large-scale techniques for Scallop culture. The proposed experiment off of Martha's Vineyard is an important part of this effort. The Council feels that potential benefits outweigh the temporary loss of this area to finfishing, and we endorse the designation.

Sincerely,

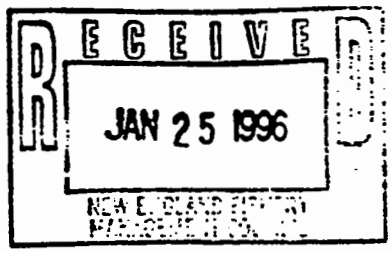
Daniel M. Crane
Executive Director

c.c.: Harley O. Halverson

UNIVERSITY OF MASSACHUSETTS
EXTENSION

Deeds and Probate Building
P.O. Box 367
Barnstable, MA 02630-0367

Cape Cod
Cooperative Extension
508-362-2511, ext.585
508-362-4518 Fax



January 22, 1996

Douglas G. Marshall, Executive Director
New England Fisheries Management Council
5 Broadway
Saugus, MA 01906-1097

Dear Mr. Marshall:

This letter is written in support of a Sea Scallop proposal submitted by a sea scallop operation owners consortium in consultation with MIT Sea Grant and the Conservation Law Foundation, Inc. The proposal is intended to establish an experimental temporary use area approximately ten miles south of Martha's Vineyard through the implementation of Amendment Six to the Sea Scallop Fishery Management Plan.

The reduced stock levels of sea scallops is well known to most harvest and management members of the northeast fisheries. The economic losses associated with this declining industry are staggering for Southeastern Massachusetts. While over-harvesting is usually thought of as the major component of the declining industry; other aspects, such as gear design, towing frequency, and bottom disruption, may impact spawning success and mortality rates.

The need for more information on how to best enhance this once thriving resource is apparent. Our country remains way behind other nations in culture knowledge of the Sea Scallop (Placopecten magellanicus). The proposal before the Council allows for an examination of various culture options, and is directed to develop an understanding of the issues and complexities of scallop seeding and growout. This type of enhancement study is long overdue.

At a recent public hearing on the Amendment six proposal at Woods Hole, concerns were raised about the location of the enhancement project. Conflicting use issues remain very problematic for aquaculture innovation given the nature of Federal waters. The same situation appears in nearshore public trust tidelands of the Commonwealth. It would be prudent on the part of the council to encourage conflict resolution and to allow for some relocation of the site. This modification should be considered without prejudice to ensure no further time delays.

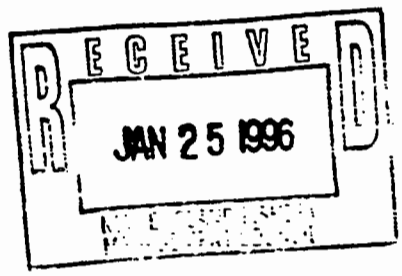
Thank you for the opportunity to comment!

Sincerely,

William P. Burt
Marine Resources Specialist

cc: Phil Coates
James Fair
Mark Forest
Cliff Goudey
Harlyn O. Halvorson
Dale Leavitt
John O'Brien
Ron Smolowitz

Cape Cod Commercial Hook Fishermen's Association
879 Orleans Road Harwich, Ma. 02645
(508) 432-8474



January 23, 1996

Mr. Douglas Marshall
New England Fisheries Management
5 Broadway
Saugus, Ma.

Dear Mr. Marshall

The CCCHFA fully endorses the proposed scallop aquaculture project south of Martha's Vineyard. The potential of increasing the stocks of any of are fisheries should be considered. This particular proposal will also allow the habitat in the proposed area to rebuild due to the absence of destructive mobile gear types.

In addition the static equipment used to raise the scallops will provide an artificial reef for the sea life in the area. I urge the council to take advantage of this project by conducting surveys of the proposed areas habitat and the areas surrounding the project site to determine the possible advantages of passively fished environments as opposed to aggressively fished ones.

Sincerely

Mark V. Leach
President -CCCHFA

TOWN OF CHILMARK
CHILMARK, MASSACHUSETTS

TOWN OFFICE:
P. O. BOX 119
CHILMARK, MASS 02
TELEPHONE 508-645-
FAX 508-645-2556

October 18, 1994

To: New England Fishery Management Council
5 Broadway
Saugus, MA 01906-1097

From: Selectmen, Town of Chilmark

To whom it may concern:

We write today to formally oppose the location of the proposed Sea Scallop Enhancement Project. We have been informed that the project applicants have stated that there is little or no opposition from Martha's Vineyard fishermen to this project. Nothing could be further from the truth.

Menemsha Harbor lies in Chilmark, Massachusetts. The proposed location is five miles south of Chilmark town waters. We presently have a small diverse fishing fleet, all of which at various times of the year use this highly productive piece of bottom that the Westport Scallop Corporation wishes your council to endorse in a takeover from the public domain.

Traditionally, this bottom has been utilized by Vineyard and New Bedford draggermen in the winter and spring for codfish, winter flounder, yellowtail, monkfish and windowpane flounder. The northern section has been utilized by tub trawl longlining for codfish. In the summer and fall the southern portion is utilized, to a lesser extent, by draggers targeting squid, butterfish, winter flounder and summer flounder (fluke). It is a highly productive lobsterground during this portion of the year. Over the years, these user groups have worked together so as there is little gear conflict between the two.

This has not been the case between lobstering and the scallopers. It is correct to state that this bottom has never been a large producer of scallops. However, what few found there, in conjunction with the lobsters in the area, have attracted scallopers to make what we fishermen believe are "shack" tows, ie: tows truly targeting lobsters and finfish on the vessel's way home. This has been done in the past with devastating results. The Vineyard lobstermen are unable to know whether or not their season is going to be successful or a bust because losses of over 100 traps in a single night are possible.

Now comes the Westport Scallop Corporation into the fray. They readily admit they will displace the draggers but they will allow lobstering. The Vineyard draggers have a tradition of

supporting measures that ensure healthy fish stocks, including a ban on night time dragging in state waters, proper targeting of species size to allow spawning to occur before harvesting, etc. but they get penalized by this location. The lobstermen will have in the middle of their grounds a scallop enhancement project that will surely attract other scallopers to try around the periphery with untold devastating results.

This concept may be the wave of the future. We on the Vineyard find it highly ironic that Vineyard fishermen that have long stood for conservation measures and enforcement will be the losers if this project, in this location, goes through. The benefits of this proposed location do not outweigh the detriments.

Thank you for your time.

Very truly yours,

Jonathan E. Mayhew, Chairman

Pamela S. Goff

Herbert R. Hancock

Selectmen of Chilmark

cc: Philip G. Coates, Director of Division of Marine Fisheries
Senator Edward M. Kennedy
Congressman Gerry E. Studds

OFFICE OF
BOARD OF SELECTMEN
RR# 1 • BOX 128
STATE ROAD
GAY HEAD, MASSACHUSETTS 02535

508-645-9915
FAX 508-645-9054

January 25, 1996

To Whom It May Concern,

The Town of Gay Head favors the awarding of a Grant to the Westport Scallop Corporation in the waters south of our town. However, the area being proposed is in the middle of our existing lobster fishery. We believe that an area ten miles to the south would protect our fishery while increasing the chances of success to the grant holders.

The town supports Sea Scallop Enhancement Project but feel strongly that giving private control over an area that currently supports a public fisheries is counter to the intent of your efforts.

Because this is a federal program, input from the local fisheries has been usurped. We have only been made aware of this proposal at the last possible moment. The attached letter form the neighboring town of Chilmark clearly states the situation and is attached. As far as we know no reply from your agency to address this obvious problem has been made. Instead we learned yesterday, that you intent to permit this grant today.

Please delay making a decision on this proposal until you can be made aware of the large negative impact on an existing fishery your efforts will have.

Sincerely,

Russell H. Smith

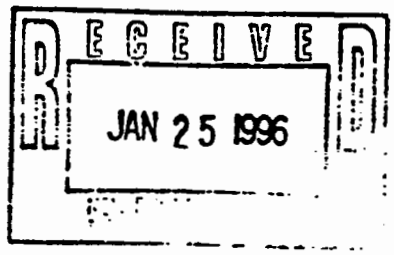
Russell H. Smith, Chairman
Gay Head Board of Selectmen/
M.V. Legislative Liason

David E. Vanderhoop

David E. Vanderhoop
Gay Head Board of Selectmen

THE MARTHA'S VINEYARD COMMISSION

BOX 1447 • OAK BLUFFS
MASSACHUSETTS 02557
(508) 693-3453
FAX (508) 693-7894



Mr. Douglas G. Marshall
Executive Director
New England Fishery Management Council
5 Broadway
Saugus, MA 01906-1097

Re: amendment #6 to the Atlantic Sea Scallop Fishery Mgmt. Plan; proposal to establish a site located 10 mi south of M.V...

January 22, 1996

Dear Mr. Marshall,

Thank you for the opportunity to review the proposed project and site located 10 miles south of Martha's Vineyard. The Martha's Vineyard Commission's response consists of staff review of the proposal and input from the January 19 hearing, with emphasis on consistency with the Martha's Vineyard Commission's Regional Island Plan. The Regional Island Plan contains policies which encourage development of aquaculture, as well as policies which promote traditional fisheries for their economic and cultural impacts.

Upon review of the proposal and after participating in the December 19 hearing, it appears that the proposal is consistent with the Regional Island Plan, so long as every effort is made to minimize impacts to the traditional fisheries of the area. Specifically, there were a number of comments from Martha's Vineyard fishermen who utilize the 9 square mile site proposed. Those fishermen offered suggestions for nearby alternative locations which might be more appropriate. Hopefully, the Council and the proponents will carefully consider the input of those users who have invaluable knowledge of the realities of the existing resources. The first hand knowledge of the captains who have offered their expert opinions is particularly significant when the reliability of the cited catch statistics is considered. According to the statistics cited in Table 1 on page 15 of the proposal, the cod catches for the 10 minute block encompassing the proposal and for New England have increased steadily since 1985, which is not true. It is difficult to place much confidence in those figures. By encouraging the participation of the traditional fishermen and by including them in a meaningful way in the formation of the final plan, the Council will go a long way toward ensuring the success of the project.

For your information, some relevant policies from the Martha's Vineyard Commission's Regional Island Plan are included here and illustrate the Martha's Vineyard Commission's commitment to promoting the development of aquaculture:

POLICIES ON FISHING, FARMING AND ISLAND INDUSTRIES[1]

I-15. Fishing and farming are ancient determinants of Island character and land use. Ensure that they remain a visible part of the landscape....

I-16. Create jobs for the skills and working habits of the year-round labor force, in industries which will prudently utilize the Island's natural resources. Encourage the development of small-scale industries (i.e. horticultural, cottage industries, forestry and adjuncts to fishing and farming). ENCOURAGE AQUACULTURE TO SUSTAIN THE COMMERCIAL FISHING ECONOMY {emphasis added}.

I-17. Foster the local fishing and agricultural economies for the benefit of the whole Island economy and character...

BASIC ECONOMIC DEVELOPMENT POLICIES

I-1. Promote more year-round economic activity. Ensure economic vitality while protecting historic integrity.

I-3. Encourage efforts to diversify the Island economy within the quality and character of Martha's Vineyard.

I-4. Give top priority to year-round job opportunities for permanent Island residents and increase the Islands's self-sufficiency, particularly in production of food products. Diversify the economic base, so that the Island will be less reliant on the building and tourist trades.

Sincerely,

Jo-Ann Taylor

Jo-Ann Taylor
Coastal Planner

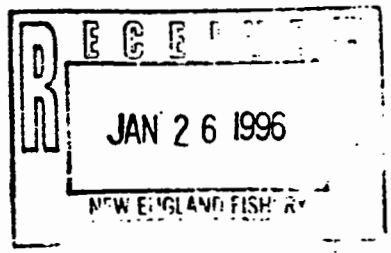
[1]Martha's Vineyard Commission, 1991, Regional Island Plan

MASSACHUSETTS AQUACULTURE ASSOCIATION

27 Village Landing ● Chatham, MA 02633 ● (508)945-1733
Fax (508)945-4275

January 23, 1996

New England Fishing Management Council
c/o Mr. Douglas Marshall
Executive Director
5 Broadway
Saugus, MA 01906



Dear Council Members:

In regards to the "Sea Scallop Enhancement and Sustainable Harvesting Project" applied for by the Westport Fishing Corp., the MASSACHUSETTS AQUACULTURE ASSOCIATION wishes to express its support. This will be a demonstration project, which hopefully should provide valuable information available for the general public to make an educated assessment as to the beneficial as well as negative effects of aquaculture in relation to the sea scallop industry. The project is experimental in nature, proposes to establish a temporary use area only, and does not create any permanent rights or interests. Whether or not the impacts on existing fisheries in the area are minimal is really a moot point as they are not being dissolved. There is no long-term privatization of the bottom, which is a whole separate issue.

The MAA additionally wishes to express its support for amendment #6 to the Atlantic Sea Scallop Fishery Management Plan (FMP) as presented by the NEFMC. The amendment serves to facilitate research, aquacultural techniques, and is necessary to enable certain restrictions on fishing and lobstering in the area during the term of the Sea Scallop Project. The exclusion of certain fisheries will enhance certain other fisheries thereby making the amendment an effective management tool for further use by the Council. Essentially the Sea Scallop Project is already providing an outline to government for an aspect of fishery conservation.

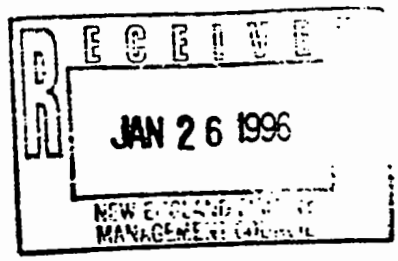
Having served for nearly a year on Governor Weld's Steering Committee for an "Aquaculture Plan for Mass" together with several other members from the MAA, we have become very familiar with the shortfalls of government in the field of aquaculture. The length of time this project has been on the drawing board should give the council some indication of the hurdles aquaculture faces. If there is a future for aquaculture, it starts with government and the MAA urges you to let it begin.

Sincerely,

John Richards

John Richards
President

JR/py



January 23, 1996

Joseph M. Brancaleone, Chairman
New England Fishery Management Council
5 Broadway
Saugus, Massachusetts 01906-1097

Dear Chairman Brancaleone:

This letter is in response to the Public Hearing Summary for Amendment #6 to the Atlantic Sea Scallop Fishery Management Plan January 1996.

As a licensed commercial fisherman, a licensed aqua farmer and a licensed wholesale seafood dealer based on the island of Martha's Vineyard, I am outraged that you would want to take away prime cod fish grounds to establish a sea scallop area which would preclude me or my grandchildren from ever setting hooks in that area. If sea scallops are developed in the proposed area, the increase in scalloping would severely limit (or make impossible) a hook or gillnet fishery.

The data concerning cod landings by ten minute block cited in Amendment #6 is seriously flawed. My F/V Laura records for the years 1985 through 1991 indicate far greater numbers from my boat alone. In November 1989 I became a wholesale seafood dealer utilizing the grandfathered business of Cyrus Norton, license #0422; the following year I founded Martha's Vineyard Seafood Incorporated, license #6932. In the years 1989 through 1991 my dealer records indicate over 500,000 pounds of cod from longline vessels fishing that area in the four- month period from January to April. The winter of 1989 there were large numbers of draggers working the area on turd cod (13" to 15"), and I distinctly recall remarking to my mate Peter Eldredge that the 43 vessels were a record in the eight years we had tub-trawled together for winter cod.

Martha's Vineyard Aqua-Farms Incorporated
106 Pilgrim Road • P.O. Box 1830 • Edgartown, MA 02539-1830
(508) 627-1299 • Fax (508) 627-9797

My first application, in 1992, for an aquaculture area came after the destruction of my F/V Laura by Hurricane Bob. As general manager of Martha's Vineyard Aqua - Farms Incorporated, I have to question the wisdom of setting up an aqua farm experiment in a traditional fishing area. Phil Coates of the DMF indicated that to move this experiment would involve a long process. I suggest that to tell the cod to go somewhere else is an impossible process. I urge you and your fellow committee members to support aquaculture but more importantly to have a mechanism to query the fishermen as to where his traditional fishing grounds are so that aqua farmers will have an area of unused water in which to practice their trade. The farmers' greatest quandary today is the siting of their farms. The proper mechanism would enable the farmer to apply for an area not in conflict with the fishermen's traditional rights of use.

We all work on the water, but there is a world of difference between fishing (taking) and farming (putting). If we continue down this path of user conflict, we will have neither. The men and women that live, work and die on the water must get along with one another in order to survive. Once again I urge you to say no to this experiment at this site and to move forward to charting areas that are suitable for aqua farming and this experiment.

Sincerely,

Michael A. Picciandra

Michael A. Picciandra, Gen. Mgr.
Martha's Vineyard Aqua - Farms Inc.

CAPE COD
ECONOMIC DEVELOPMENT COUNCIL

Barnstable Municipal Airport
480 Barnstable Road
Hyannis, Massachusetts 02601

JOHN D. O'BRIEN
Executive Director
Phone 508-790-4980
Fax 508-790-1889

January 24, 1996

Mr. Douglas G. Marshall
Executive Director
New England Fisheries Management Council
5 Broadway
Saugus, MA. 01906-1097

Dear Mr. Marshall:

We are writing this letter in support of the Westport Sea Scallop Aquaculture Project. This project will demonstrate the economic viability of bottom and suspended cage culture for sea scallops and involve a number of local fishermen and their vessels in this determination.

This project has enormous potential for the suffering New England fishery. The effort to encourage our local fishermen to understand the economic benefits possible in the shift from strictly harvester technologies to cultivar technologies is critical at this time. The potential for profitable seafood production from these aquaculture efforts is very real, and the successful completion of this project will provide hard evidence to this industry of the viability of these efforts.

At the public hearing held January 19 in Woods Hole, the project proponents heard a small but vocal and concerned group of fishermen from Martha's Vineyard express concern over the specific siting of this project. They raised the possibility of shifting the site location to an area further south of its present location, and away from traditional and historic use patterns. Although we understand their concerns as reasonable, we would not like to see this project be delayed by further bureaucratic or agency delays.

We would underscore our desire to see this project implemented. At every point in the developmental process of this industry we will face conflicting use scenarios and must make every effort to solve these problems before they arise. We must involve all stakeholders in the development of the siting issues involved in aquaculture in the EEZ. We are satisfied that the attempt has been made to do so in this case. Although problems may remain, we believe that the project managers have demonstrated a willingness to include all parties in the future operations of this project.

We urge the full council to vote to endorse the Westport Sea Scallop amendment to the management plan.

Thank you for your efforts in this issue. The New England Fisheries Management Council will have the opportunity to begin to define their role in the future management of offshore aquaculture in voting on this issue. We hope you will send a clear signal of support for properly designed and conducted projects. This is a unique opportunity to do so. The project has the potential for significant benefit to fishermen, the seafood industry, and society.

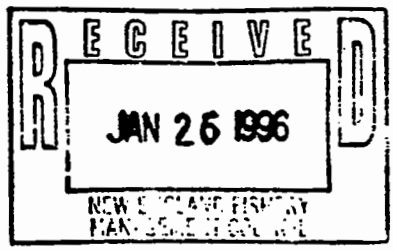
Sincerely yours,

John O'Brien
Executive Director

Michael Collins
Fisheries and Marine Industry Coordinator

Barbara Bragdon
B.T.G. Fisheries
P.O. Box 789
Dennisport, MA 02639

Mr. Douglas Marshall
New England Fishery Management Council
5 Broadway
Saugus, MA 01906



January 26, 1996

Dear Doug,

I am writing to support the Westport Scallop Project. It is one of the few aquaculture projects I have seen which presents an opportunity for the existing scallop fleet to become involved in aquaculture. I strongly feel it is important for the fleet to learn some new methods to help control the cyclic nature of the scallop fishery. I also like the fact that the project uses the natural population rather than "farm raised" spat. I hope the Council will support this project.

Sincerely,

Barbara Bragdon
President, B.T.G. Fisheries

COMMONWEALTH OF MASSACHUSETTS
MASSACHUSETTS SENATE
STATE HOUSE, BOSTON 02133-1053

SENATOR HENRI S. RAUSCHENBACH
CAPE & ISLANDS DISTRICT
ROOM 315
TEL. (617) 722-1570
DISTRICT OFFICE
TEL. (508) 362-4556

COMMITTEES:
SENATE WAYS AND MEANS
STEERING & POLICY

January 18, 1996

Douglas G. Marshall, Executive Director
New England Fisheries Management Council
5 Broadway
Saugus, MA 01906-1097

Dear Mr. Marshall:

I am writing in support of the sea scallop aquaculture project proposed by Ron Smolowitz. This 9 square mile site located 10 miles south of Martha's Vineyard will serve as a demonstration project, facilitating aquaculture research.

This is a step in the right direction for the growth of the aquaculture industry. The State of Massachusetts has made an effort under the direction of Governor Weld to find ways to promote this industry. The resulting report " *The Aquaculture Strategic Plan*" proposed several recommendations on this matter. Pilot projects such as this one provide a working example upon which future policy and economic development initiatives may be based.

Considering the present state of the commercial fishing industry, the support of aquaculture projects has an important role in the preservation of the region's maritime economy. I am aware that there may be some conflict between this proposal and the traditional fisheries, over the use of the site. I know you will weigh these issues when making your decision. I hope that this project will be able to move forward with the consideration of the other parties involved. If I can be of any assistance, please do not hesitate to contact my office.

Sincerely,

HENRI S. RAUSCHENBACH
State Senator
Cape & Islands District

HSR/tt
cc: Ron Smolowitz, Coonamessett Farm
Harlyn O. Halvorson, UMass Dartmouth

26 January 1996

to: New England Fisheries Management Council, 5 Broadway, Saugus, Massachusetts 01906-1097
from: Richard Taylor, F/V My Marie, Box 7002, Gloucester, Massachusetts 01930

Subject: **Proposed 9-square mile Scallop Project Area**, south of Martha's Vineyard.

Councilmembers,
This letter is to express my support for this project and here are the main reasons why:

1. This is not just an experiment. Controlled growout of oysters in the inshore waters of Connecticut is a $60 million/year business. Current efforts with sea scallops in Canada, New Zealand, and decades of experience in Japan demonstrate that methods of scallop production including bottom seeding, bottom cage growout, lantern nets, and earhanging have not only stabilized typical fluctuations in landings but increased them to many times the highest dredged amounts and held them there every year.

2. There is much controversy over the **impact of mobile gear on the bottom habitat** that we all depend on, as well as issues of bycatch, including effects on juveniles of all species. Methods of production that do not require repeated dregding of thousands of square miles by the fleet must be developed.

3. This project suggests **a natural alliance** between fixed gear fisherman and sea scallop growers **to develop areas closed to mobile gear**. VTS technology is scheduled to come online in the near future. Hook fisheries and trap fishing of all types can coexist in areas of bottom seeding except at time of harvest, which may be only once every 2-3 years, depending on initial size of seed stock. In addition, there is ample evidence that fishing of all types is markedly improved at the margins of closed areas.

4. This project also serves to point out the **inherent difficulties of our permitting methods** and overlapping agency jurisdictions, and the need for evolving necessary simplifications for future development in the EEZ of the Northeast region. I would hope that we will not need a separate amendment, more than a year of the Council's, the proponent's, and the public's time, for other research or commercial projects. We need to evolve a more systematic approach for this to occur.

5. This amendment is the only one to date that looks to build a future beyond letting an overworked fishery recover. Projected sustainable harvests of fully recovered wild stocks will not feed our large numbers. With the development of suitable areas, hatchery-based shellfish growout is an immediately viable addition to the current industry. Growout areas like this are needed from Cape Hatteras to the Hague line. **We need to demonstrate and develop sound alternate methods of shellfish and finfish production** in the EEZ in order to supply the US population now and in the years ahead.

This project is a good start.

Respectfully,

Richard Taylor

Martha's Vineyard Shellfish Group. Inc.
Box 1552
Oak Bluffs, Massachusetts 02557
508 693-0391

January 30,1996

Douglas G. Marshall, Executive Director
New England Fisheries Management Council
5 Broadway
Saugus, MA 01906-1097

Dear Mr. Marshall:

I am writing to register my support to establish an experimental area south of the Vineyard to conduct an 18 month experiment and demonstration project involving sea scallop research and aquaculture. Although I had planned to attend the hearing on January 19, 1996, a death in the family prevented my participation.

I strongly support the establishment of a designated area to carry out the proposed sea scallop aquaculture work. The potential economic rewards and spin offs from this project promise to be nothing less than monumental. This is the historic first step that could revolutionize the way we exploit the area's sea scallop resources. If successful, this project could point the way to replacing the present dredging methods that destroy shellfish seed and habitat with aquaculture technology more kindly to both the species and the environment. Clearly, our present management strategies are not working and the times demand a bold, new approach to managing this very valuable renewable shellfish resource. Clearly, the Japanese, the Chinese, and lately the Canadians are culturing scallops and expanding their share of the market. With only a tiny area of the present fishing grounds dedicated to aquaculture , this country might still play a role in the seafood industry of the future. If we refuse to open our eyes and policies to the promise of the future, we stand to lose further ground to our farsighted competitors. I hope you can see the historic impacts of this project.

We have demonstrated that millions of sea scallop seed can be easily cultured in the hatchery. This project promises to break new ground for leasing off shore areas and develop gear and technologies to allow aquaculture in the open sea. Any development in the aquaculture of this economically most valuable species promises wide ranging economic impacts.

I am aware that there is strong opposition from traditional fishing interests for the proposed project area. This project is far too important to be abandoned. I truly hope that some means of agreement may be established to allow this historic first step in sea scallop aquaculture to be permitted.

Sincerely,

Richard C. Karney
Shellfish Biologist/Director

New England Fishery Management Council
5 Broadway • Saugus, Massachusetts 01906-1097
TEL (617) 231-0422 • FTS 8-617-565-8457
FAX (617) 565-8937 • FTS 8-617-565-8937

Chairman
Joseph M. Brancaleone

Executive Director
Douglas G. Marshall

MEMORANDUM

May 23, 1996

TO: Sea Scallop Committee
FROM: Council Staff
SUBJECT: Public Hearing Summary, Sea Scallop Experiment, Enhancement and Aquaculture Project, May 17, 1996

Shortly before the April Council meeting the proponents of the sea scallop project proposed for federal waters south of Martha's Vineyard notified the staff that members of the fishing community, including lobstermen, scallopers and trawl vessel operators had reached consensus on a new site for the project. All parties agreed that the alternative location, approximately 3 miles southwest of the original location, was preferable to the site initially proposed and included in Amendment 5 to the Sea Scallop Plan.

To accommodate this agreement the Council withdrew the amendment, which already had been submitted to the National Marine Fisheries Service (NMFS), and agreed to hold an additional hearing on May 17 to ensure that all interested parties had an opportunity to comment on the new site.

No opposition was voiced at the hearing and support was expressed by the William Adler, Executive Director of the Massachusetts Lobstermen's Association and Jon Larsen, a Martha's Vineyard lobsterman. A NMFS employee inquired about the proponent's intent to monitor possible habitat alterations by various gears used to harvest scallops. Project managers replied that they had agreed to this cover this topic as part of a final report. Mr. Larsen and the project managers agreed they would work out any concerns about the placement of lantern nets in areas where lobster fishing took place. Project managers also expressed a need to further discuss their request to NMFS for an experimental fishery in order collect small scallops for seeding purposes.

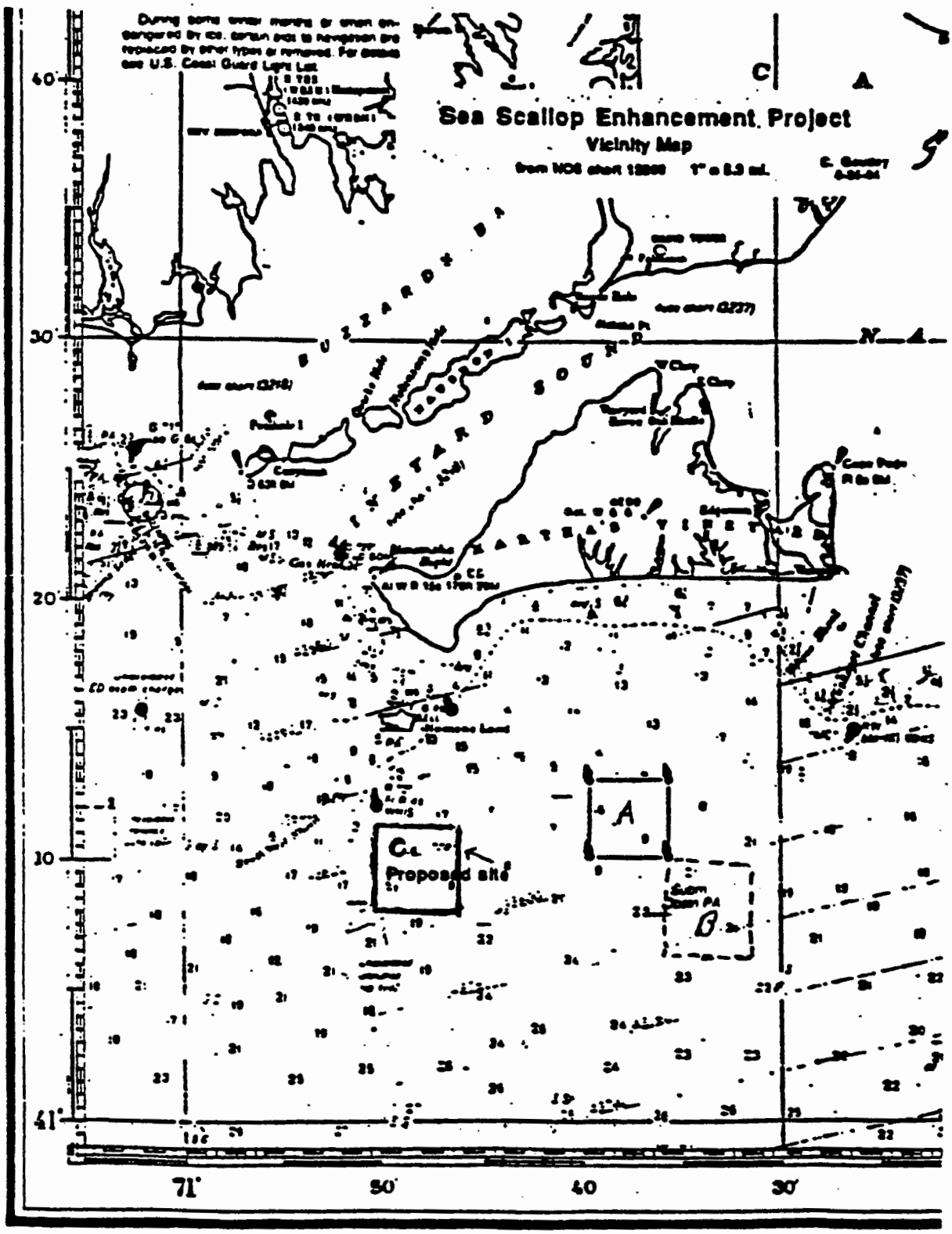
NEW ENGLAND FISHERY MANAGEMENT COUNCIL
Suntaug Office Park - 5 Broadway - Saugus, Massachusetts 01906
617/231-0422 FTS: 617/565-8457

PUBLIC ATTENDANCE SHEET

ATTENDANCE AT: Scallop Amendment #5 Public Hearing (Westport Project)
DATE: May 17, 1996 LOCATION: Cranberry Experiment Station, Wareham, MA
CERTIFIED BY: _____

PLEASE PRINT

Name	Mailing Address	Telephone
Phil Coates	NEFMC	
Cliff Goudey	MIT Sea Grant	617 253-7079
Dale Leavitt	WHOI-	508 289-2997
John T. Caskey	NMFS	508-281-9118
MARGARET TONER	NMFS	401-847-3115
John A Lawsen	Box 121 Edgartown	508-627-3938
Ronan Smolowitz	277 Hatchville Rd	508-564-5516
RICHARD TAYLOR	BOX 7002 GLOUCESTER	508-281-3146
Pat Fiorelli	NEFMC Staff	



13200
LORAN-C OVERPRINTED

A — SUBMITTED SITE IN AMENDMENT
B — WAS PROPOSED FLIP-FLOP SITE
C — IS NEW PROPOSED SITE

MIT Sea Grant College Program
Center for Fisheries Engineering Research

FAX Message

Date: 11 April 1996

To: Ron Smolowitz
Coonamesset Farm
227 Hatchville Road
East Falmouth, MA 02536

FAX: 508-564-5073
Phone: 564-5516

From: Cliff Goudey
MIT Bldg. E38-272
292 Main Street
Cambridge, MA 02139

Fax: 617-258-5730
Phone: 253-7079
email: cgoudey@mit.edu

Subj. Alternative site coordinates

I have plotted a new location that meets the concensus of today's meeting. The coordinates are

Corner	Lat. N	Long. W	Loran-W	Loran-Y
NW	41° 11.8'	70° 50'	14267	43834
NE	41° 11.8'	70° 46'	14244	43828
SE	41° 08.8'	70° 46'	14255	43807
SW	41° 08.8'	70° 50'	14278	43813

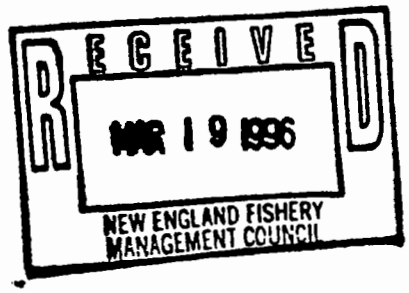
In the attached copy of the 13218 chart, I have included the original and the suggested alternative. I plan to call Johnathan to see if he would like this information.

new england fisheries development association, inc.

451 D Street • Boston, Mass. 02210 (617) 443-9494 Fax: (617) 443-9499
Internet – 75501,3402@compuserve.com

March 19, 1996

Mr. Douglas Marshall, Executive Director
New England Fisheries Management Council
Suntaug Office Park
Saugus, MA 01906



Dear Mr. Marshall:

The New England Fisheries Development Association (NEFDA) supports the sea scallop enhancement project directed by Cliff Goudey and Ron Smolowitz.

NEFDA has also been awarded a NMFS Saltonstall-Kennedy grant to study sea scallop aquaculture. Our project will investigate spat collection and grow-out of sea scallops at sites in Maine, Massachusetts and New Hampshire. NEFDA would like to work in cooperation with other similar projects, such the Goudey-Smolowitz sea scallop enhancement project. We have spoken to Ron Smolowitz about locating spat collection gear at their site in order to broaden our study area, and we would like to obtain wild caught seed from their study for the grow-out portion of our project. NEFDA supports the Goudey-Smolowitz study since our project will be enhanced by being able to work cooperatively.

Sincerely,

Sue Kuenstner
Program Director

Martha's Vineyard Shellfish Group, Inc.
Box 1552
Oak Bluffs, Massachusetts 02557
508 693-0391

27. March, 1996

Douglas G. Marshall, Executive Director
New England Fishery Management Council
5 Broadway
Saugus, Massachusetts 01906

Dear Mr. Marshall:

I am writing to register my support of the application for a license for an experimental joint aquaculture venture by Martha's Vineyard Aquafarms, Inc. and Blue Gold Technologies, Inc. The applicants have requested a site approximately 20 acres in size in Nantucket Sound in waters the Supreme Court recently ruled to be under Federal jurisdiction. The proposed activities include the culture of bay scallops and blue mussels. The shellfish culture will employ off-bottom rope and lantern net culture and bottom cage culture very similar to the methods recently approved by the Council under Amendment 6 for the Westport Sea Scallop Enhancement Project.

Robert Plante, Vice President of MV Aquafarms, recently completed training under the Martha's Vineyard Shellfish Group Aquaculture Training Program. He is consequently eligible for technical and material assistance for the project under the Martha's Vineyard Private Aquaculture Initiative – Aquaculture Start-up Assistance (FIG Grant # NA66SK0073) which has recently been funded by the National Marine Fisheries Service. To qualify for this funding opportunity, it is important that all possible efforts be made to expedite the license approval.

Thank you for your time and consideration, and please feel free to call should you have any questions.

Sincerely,

Richard C. Karney
Shellfish Biologist/ Director

cc/ Robert Plante
Linc Murray

Massachusetts Lobstermen's Association, Inc.
8 OTIS PLACE, P.O. BOX 600
SCITUATE, MA 02066-0006
TEL. (617) 545-8984
FAX (617) 545-7837

MEMO

TO: Pat Fiorelli, NEFMC April 18, 1997

FROM: Bill Adler, Executive Director
Mass. Lobstermen's Assoc., Inc.

SUBJECT: Proposed Site Change for Scallop Project

The Massachusetts Lobstermen's Association is in support of the proposed shift in the site of the Scallop Enhancement Project from south of Martha's Vineyard to a site south of Nomans on the coordinates as provided to us by the Project Coordinator. (Site specs enclosed).

We understand that this new site has been approved by the New Bedford area scallop and dragging representatives and by the Project managers as well. We are hereby adding our approval to the proposal. We would therefore request that the NEFMC and NMFS approve this change.

The Massachusetts Lobstermen's Association represents the majority of affected Martha's Vineyard lobster fishermen and most of the lobster fishermen who fish in the new proposed site south of Nomans.

We would ask that the Project managers convene meetings as needed between themselves and other users of the site so all involved can work together in a cooperative fashion. The Project Coordinators have indicated that they would do this with regard to the previously selected site and we believe this would be most welcome on the newly agreed upon site.

May 12 1996

To The New England Fishery Management Council

On March 24, 1996 a Meeting was held on Marthas Vineyard regarding The location of the Seascallop Projects site. The Vineyard Fishermen Strongly opposed its location.

We recommended to Flip-Flop the site once to the South and once to the East. This made the Southeast Corner of the original site The Northwest Corner of The New site.

The Vineyard Fishermen and Project Managers agreed on This site, but it was later learned That the New Bedford Draggers had a problem with This site.

In April, a Meeting Took Place in New Bedford. At This Meeting a third Site was worked out South of Nomans.

We, The undersigned Vineyard Fishermen, do not oppose The use of This site for This 18 month experimental Project.

—See Attached Sheets—

Name	F/V	Phone
John A. [illegible]	F/V Summer Dawn	645-3805
Stephen W. [illegible]	F/V Esther's Pride	645-3039
John S. [illegible]	F/V ROYAL	693-4295
Matthew A. [illegible]	F/V Jennifer & Matthew	645-9430
Chris Murphy	F/V Theresa M.	645-2833
Craig [illegible]	F/V Viking	693-165[illegible]
[illegible]	F/V [illegible]	645-945[illegible]
[illegible]	F/V Merlin	696-8968
David Chipperfield	F/V Right Stuff	627-5669
[illegible]	F/V LINDA D	693-1688
James R. Morgan	F.V Mary & Norma	645-2655
Mike [illegible]	F.V Room To Move	696-7409
Marlon [illegible]	F/V LOYAL	693-1211
[illegible] R. [illegible]	F/V [illegible]	645-2629
Raymond P. Gale	F/V Maciah	693-6864

Sea Scallop Working Group

c/o Harlyn Halvorson
PCMBT
Univ. Of Mass. Dartmouth
Dartmouth, MA

Douglas Marshall
New England Fishery Management Council
Saugus, MA

Dear Mr. Marshall:

Please accept this letter as an endorsement to the revised siting plan for the Westport Scallop Corp.'s proposed Sea Scallop Aquaculture Research Site. The process to establish this site has been an iterative discussion between the primary users of the proposed site and the Westport Scallop Corp. The end result has been a site that is acceptable to all.

Using this mediated process to reconcile differences ensures the success of the project as all of the interested parties have been consulted and have accepted the final results of the discussions. The Sea Scallop Working Group encourages the New England Fishery Management Council not only to permit the site as discussed above but to also encourage the coordinated development of off-shore aquaculture. The role of the NEFMC can be influential in the development of a single comprehensive and "user-friendly" permitting process where all relevant regulatory agencies and protential conficting users are brought into the permit application early and their concerns addressed expeditiously.

Thank you for allowing the Working Group to provide comment on this issue.

Sincerely,

Harlyn O. Halvorson

Harlyn Halvorson
representing the Sea Scallop Working Group

University of Massachusetts
Dartmouth

285 Old Westport Road
North Dartmouth
Massachusetts 02747-2300

508
999-8000

UMass Dartmouth

May 21, 1996

Mr. Douglas Marshall, Executive Director
New England Fisheries Management Council
Suntaug Office Park
Saugus, MA 01906

Dear Mr. Marshall;

The Sea Scallop Working Group (SSWG) in Massachusetts has followed with interest the Council's deliberation and recent actions with respect to the Westport Sea Scallop Project's application for exclusive use as an experimental area. We applaud the Council's approval of Amendment #6 as an responsible step in advancing sea scallop aquaculture towards its potential role as an engine for economic growth in the region.

As no doubt you, your staff, and the Council members recognize, aquaculture in the EEZ is a complicated issue. Its facilitation under the Magnuson Fisheries Conservation and Management Act presents great challenges.

The SSWG has read William J. Brennan's report "Background Information and Recommendations for New England Fisheries Management Council Development of an Aquaculture Policy and Management Strategy" and we would like to take this opportunity to express both our support and some concerns regarding the process that is now facing the Council.

General - We agree with the report that EEZ aquaculture is an area that the Council has a significant interest. This view is based not only on the legal standing of the Council with respect to EEZ fisheries but also logically, based on the direct implications of aquaculture on commercial fishing and natural stocks.

Definitions - If, as the Brennan report suggests, some aquaculture hardware is fishing gear, then it should also be a candidate for a general exemption from COE permitting. This issue needs to be clarified by both agencies. There are forms of aquaculture, such as bottom-cage culture of sea scallops, that are operationally similar to fixed gear fishing, and arguably more bengin. If those forms of grow-out could be exempted, it would provide significant relief for both Council and potential practitioners.

Legal Role - The Council needs to firmly establish its legal authority to manage EEZ aquaculture and, as suggested in the report, the Council must have a clear aquaculture policy. Further, the SSWG believes that a streamlined application and review process must be developed to ensure timely processing and evaluation.

There is general satisfaction with the current ACOE permitting process and its associated agency reviews. Redundancy with the ACOE should be avoided by focusing the Council's attention on fishing conflicts and impacts on regulated stocks.

Council Staffing - The Council will need adequate resources to properly carry out its aquaculture-related tasks. Your current staff's responsibilities in the development and refinement of FMP's leave little room for new initiatives. The SSWG feels strongly that the Council must have additional staff to properly carry out its EEZ aquaculture responsibilities.

Evaluation Criteria - The Council needs to develop and publish criteria for evaluating applications. Those criteria must be developed in an open process with advice from a full range of stake holders. We would caution the Council from adopting standards which substantially exceed criteria used in evaluating fishing proposals.

Rents & Royalties - The charging of administrative costs or additional fees to aquaculture applicants should be done equitably with respect to current practices for fisheries management plans. With current fishing permits limits, Council activity is already in support of a finite number of commercial operations.

We reiterate our support of the Council in its efforts to develop and implement an aquaculture policy. The SSWG has labored for over a year, seeking to support and guide industry and institutional efforts towards sustainable sea scallop production. We would be pleased to assist the Council or its Aquaculture Committee in furthering our mutual goals.

Sincerely,

Harlyn O. Halvorson

Dr. Harlyn O. Halvorson
Member SSWG
Director Policy Center for Marine Biosciences and Technology
Univ. of Massachusetts Dartmouth

APPENDIX H

Army Corps of Engineers

Permit Process

SeaStead Project

Public Notice

US Army Corps
of Engineers
New England Division

Date:
Sept. 20, 1994

Comment Period Closes:
Oct. 21, 1994

In Reply Refer To:
Grant Kelly

File No.
1994-02176

424 Trapelo Road, Waltham, MA 02254-9149

Westport Scalloping Corporation, 113 MacArthur Drive, New Bedford, MA 02740 has requested a Corps of Engineers permit under Section 10 of the Rivers and Harbors Act of 1899, to deploy and maintain a sea scallop (Placopecten magellanicus) grow-out facility in the Atlantic Ocean approximately 8 miles south of Martha's Vineyard, MA. The proposed equipment would be deployed within a 3 mile square area in approximately 100 feet of water at coordinates shown on the attached plans. A 460' long 4-point moored string will support a grow-out array of spar buoys from which are suspended 10' diameter lantern nets (cylindrical cages with stacked interiors) whose tops are at least 14' below the surface. The surface termini of the string are marked by 42" diameter spherical buoys. This grow-out array is deployed near the northerly limit of the work area. The balance of the site is to be used for bottom culture grow-out lanes, 2.5 miles in length by 0.25 miles wide, with lane termini and mid-points being marked by 30" diameter inflatable buoys. The 4 corners of the site are marked by 48" diameter picket buoys equipped with radar reflectors and lights. A minimum 0.25 mile wide equipment/culture-free buffer area exists inside the project perimeter. Seed scallops will originate from nursery stock and from re-located undersize bycatch. Seed placement, husbandry and harvesting will be accomplished by participating commercial scallop draggers. Purpose of the project is the research and development of techniques for the capture, holding, transportation, seeding, husbandry, and harvesting of sea scallops.

In order to properly evaluate the proposal, we are seeking public comment. Anyone wishing to comment is encouraged to do so. Comments should be submitted in writing by the above date. If you need additional information, please contact Mr. Kelly at the above address.

Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider the application. Requests for a public hearing shall specifically state the reasons for holding a public hearing. The Corps holds public hearings for the purpose of obtaining public comments, when that is the best means for understanding a wide variety of concerns from a diverse segment of the public.

Sincerely,

Karen Kirk Adams
Chief, Permits Branch
Regulatory Division

SEE REVERSE SIDE FOR
DETAILS OF EVALUATION
FACTORS

The decision whether to issue a permit will be based on an evaluation of the probable impact of the proposed activity in the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit which may reasonable accrue from the proposal must be balanced against its reasonably foreseeable detriments. All factors which may abe relevant to the proposal will be considered, including the cumulative effects thereof; among those are: conservation, economics, aesthetics, general environmental concerns, wetlands, cultural values, fish and wildlife values, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food production and, in general, the needs and welfare of the people.

Where the activity involves the discharge of dredged or fill material into waters of the United States or the transportation of dredged material for the purpose of disposing it in ocean waters, the evaluation of the impact of the activity in the public interest will also include application of the guidelines promulgated by the Administrator, U.S. Environmental Protection Agency, under authority of Section 404(b) of the Clean Water Act, and/or Section 103 of the Marine Protection Research and Sanctuaries Act of 1972 as amended.

Based on his initial review, the District Engineer has determined that little likelihood exists for the proposed work to impinge upon properties listed in or eligible for listing in the National Register of Historic Places, and no further consideration of the requirements of the Preservation of Historical and Archaeological Data Act of 1974 is necessary. This determination is based on one or more of the following:

a. The permit area has been extensively modified by previous work.
b. The permit area has been recently created.
c. The proposed activity is of limited nature and scope.
d. Review of the latest published version of the National Register shows that no presence of registered properties or properties listed as being eligible for inclusion therein are in the permit area or general vicinity.

Presently, unknown archaeological, scientific, pre-historic or historical data may be lost or destroyed by work to be accomplished under the requested permit.

Pursuant to the Endangered Species Act, the District Engineer is hereby requesting that the appropriate Federal Agency provide comments regarding the presence of and potential impacts to listed species or its critical habitat.

The initial determinations made herein will be reviewed in light of facts submitted in response to this notice.

The following authorizations have been applied for, or have been, or will be obtained:

(X) Permit, License or Assent from the State.
( ) Permit from Local Wetland Agency or Conservation Commission.
( ) Water Quality Certification in accordance with Section 401 of the Clean Water Act.

The States of Connecticut, Maine, Massachusetts, New Hampshire and Rhode Island have approved Coastal Zone Management Programs. Where applicable the applicant states that any proposed activity will comply with and will be conducted in a manner that is consistent with the approved Coastal Zone Management Program. Issuance of a State permit from the appropriate State agency will indicate concurrence with this statement of Consistency.

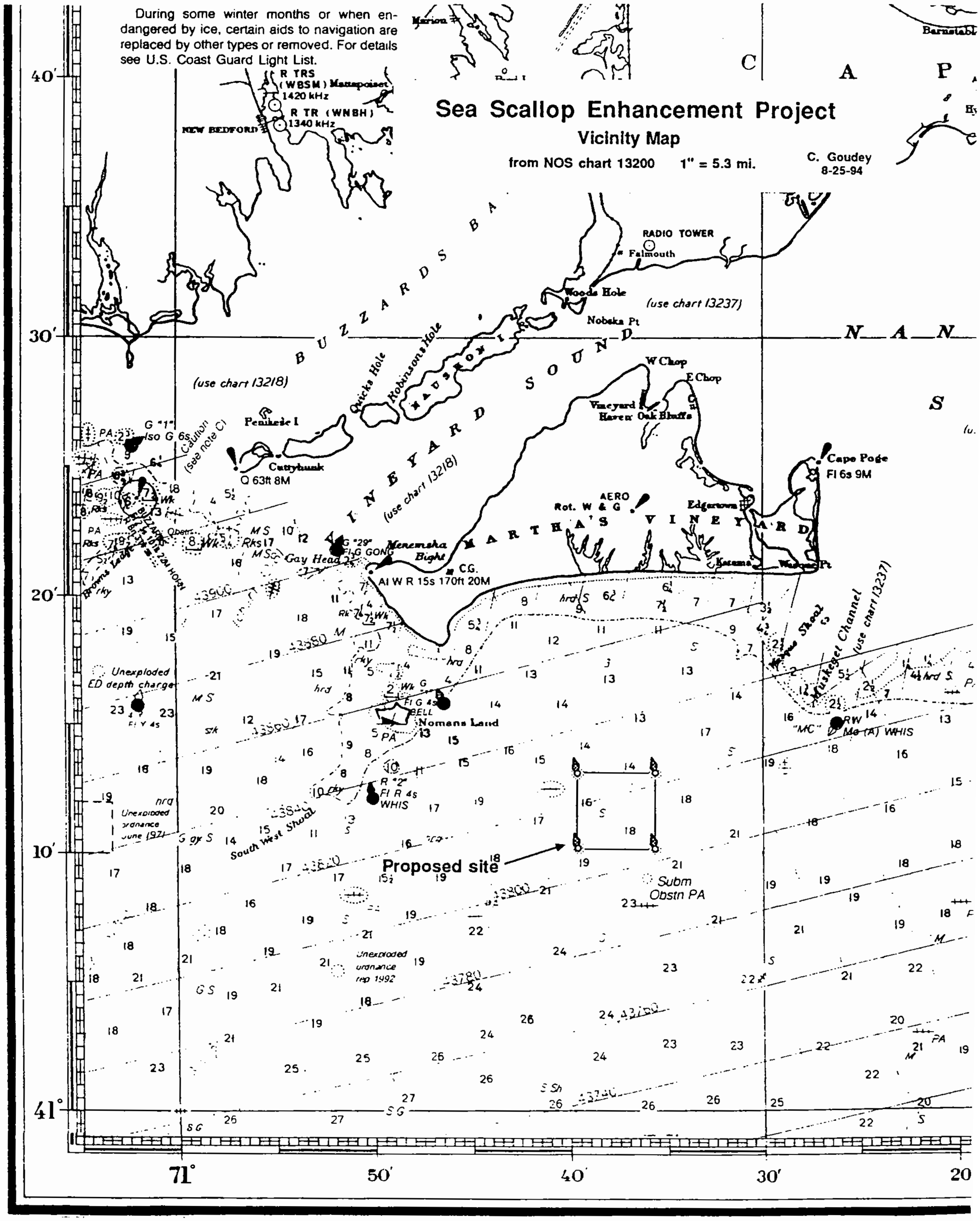
All comments will be considered a matter of public record. Copies of letters of objection will be forwarded to the applicant who will normally be requested to contact objectors directly in an effort to reach an understanding.

THIS NOTICE IS NOT AN AUTHORIZATION TO DO ANY WORK.

If you would prefer not to continue receiving public notices, please check here ( ) and return this portion of the public notice to: U.S. Army Corps of Engineers - New England Division, Attn: Regulatory Divisicn, Bldg 108N, 424 Trapelo Road, Waltham, MA 02254-9149.

NAME:_____

ADDRESS:_____



28th Ed., Sept. 11/93

13200

LORAN-C OVERPRINTED

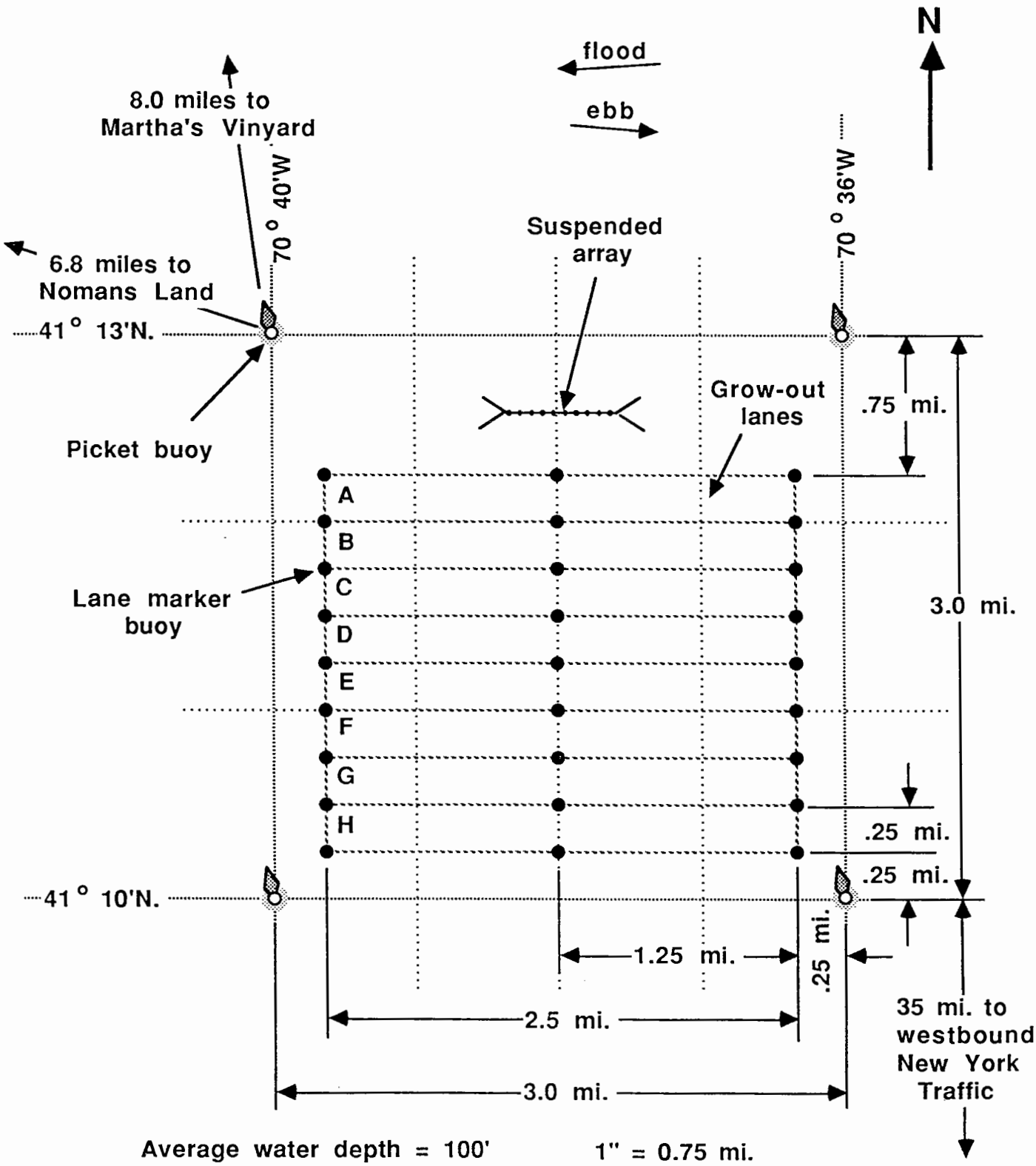
CAUTION

...s chart has been corrected from the Notice to Mariners published ... the Defense Mapping Agency Hydrographic/Topographic ... the Canadian Ministry of Transport and the Local Notice to Mariners issued periodically by each U.S. Coast Guard district to the date shown in the lower left hand corner.

C. Goudey
8-25-94

Sea Scallop Enhancement Project

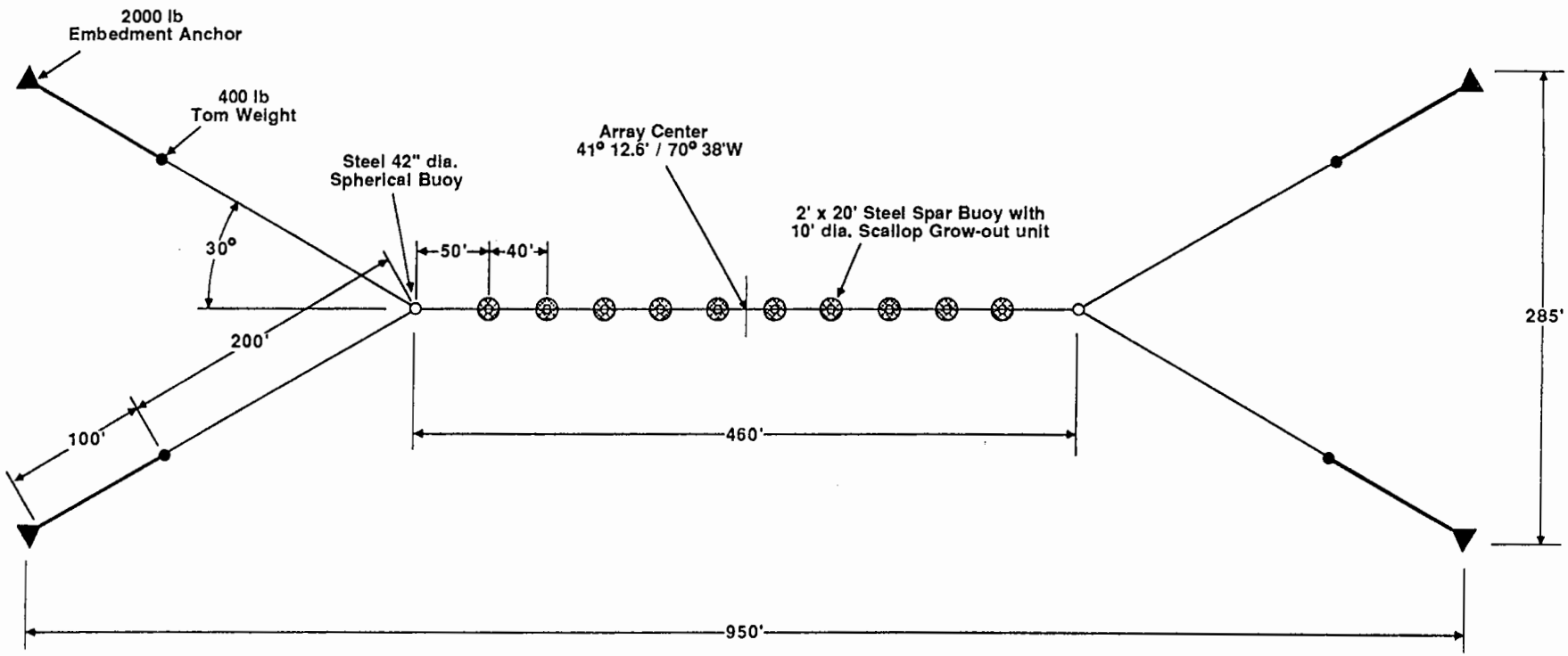
Site Plan



Average water depth = 100' 1" = 0.75 mi.

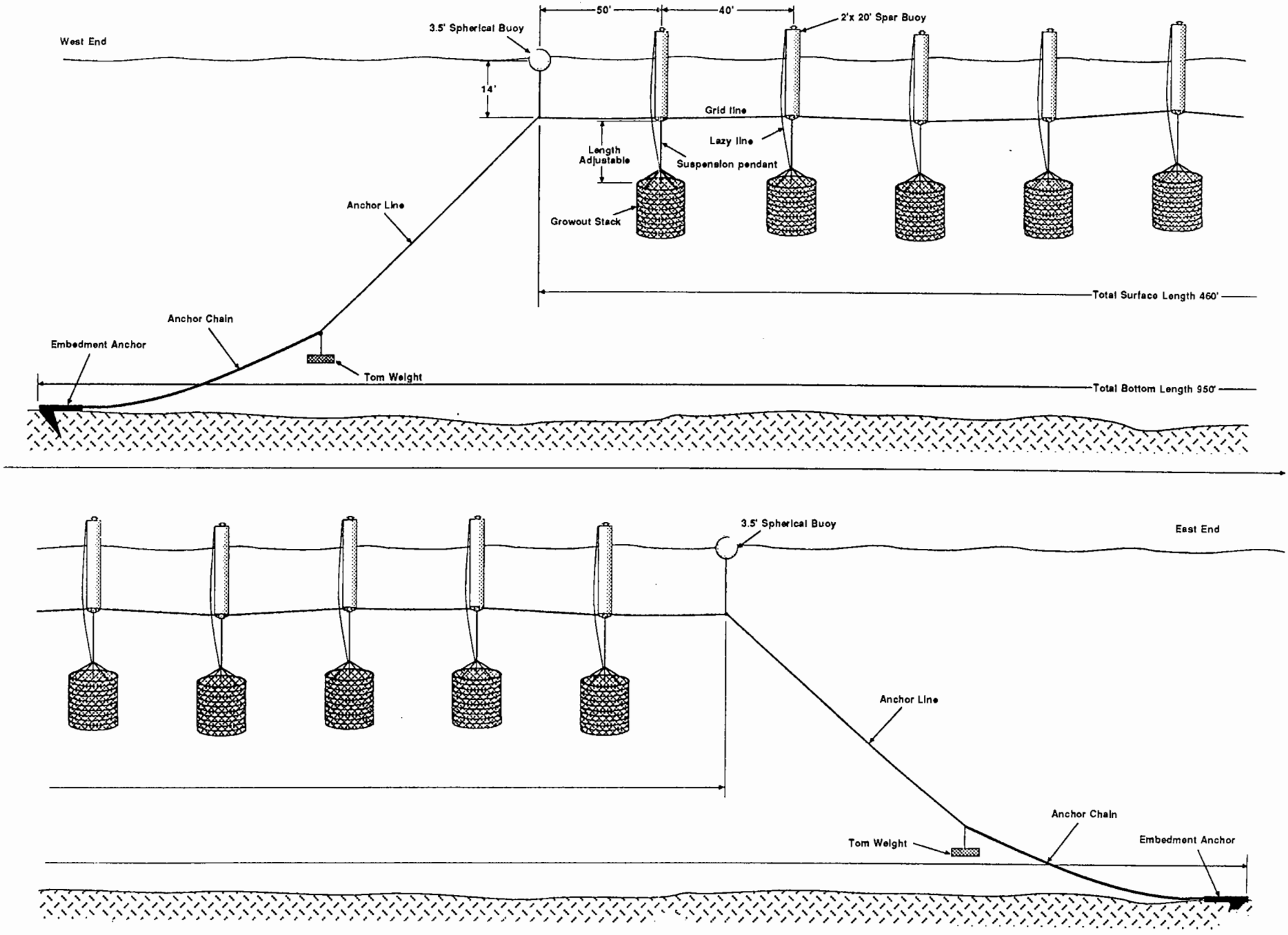
Sea Scallop Grow-out System - Array Plan

C . Goudey
8-25-94



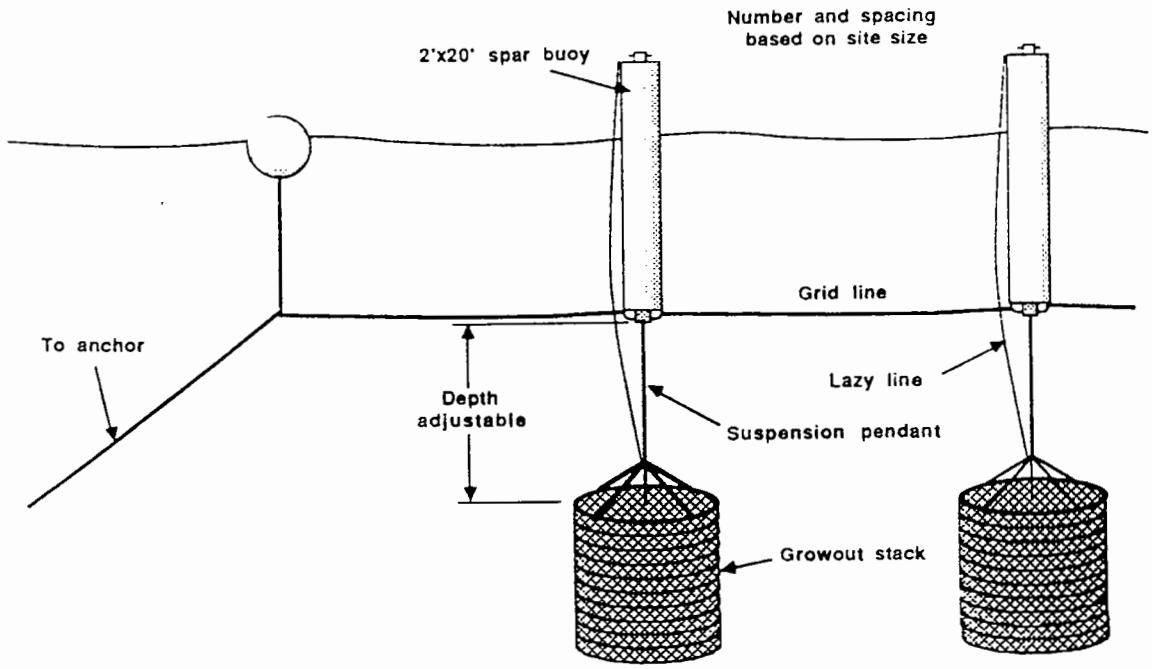
Sea Scallop Grow-out System - Array Elevation

C. Goudey
8-25-94



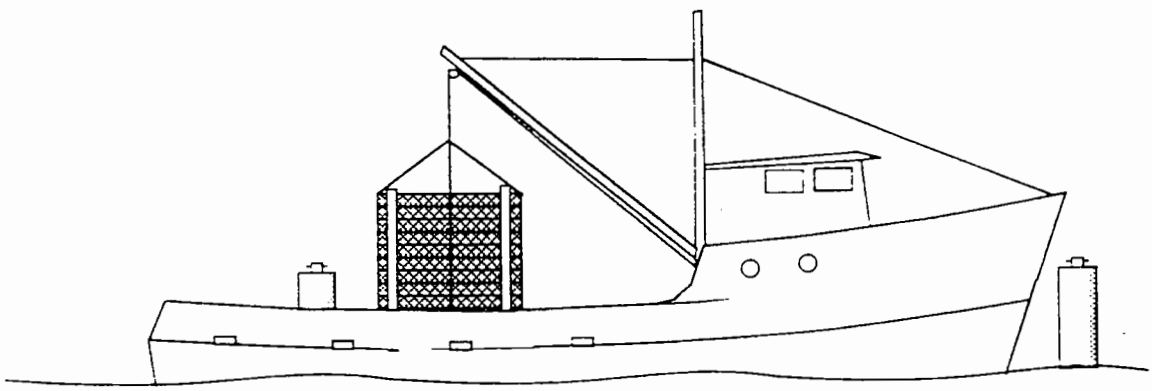
C. Goudey
5-13-94

Sea Scallop Grow-out System



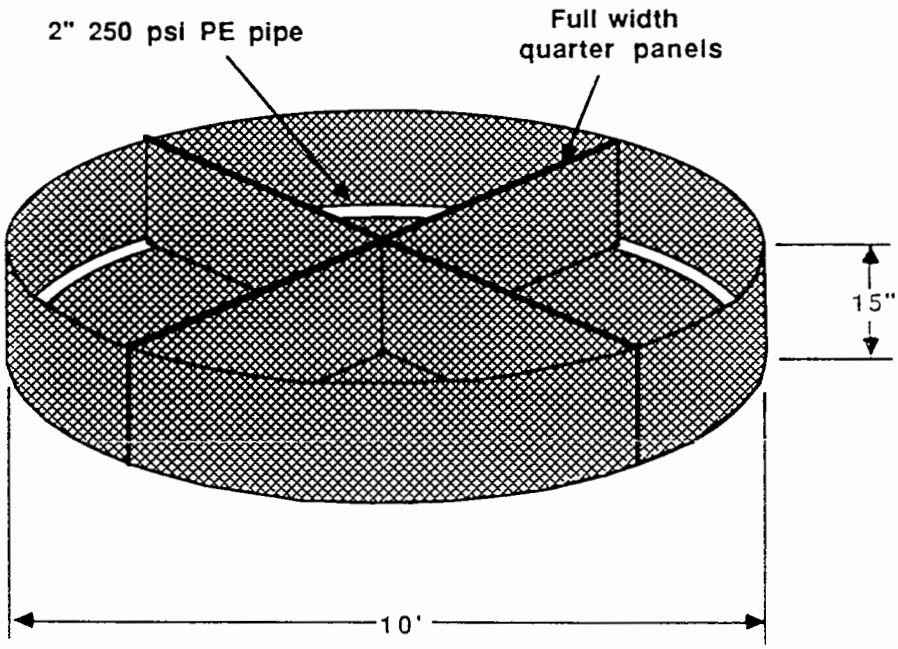
C. Goudey
5-13-94

Stack Handling on Deck



Growout Unit

78.5 Sq. Ft. of horizontal growing area



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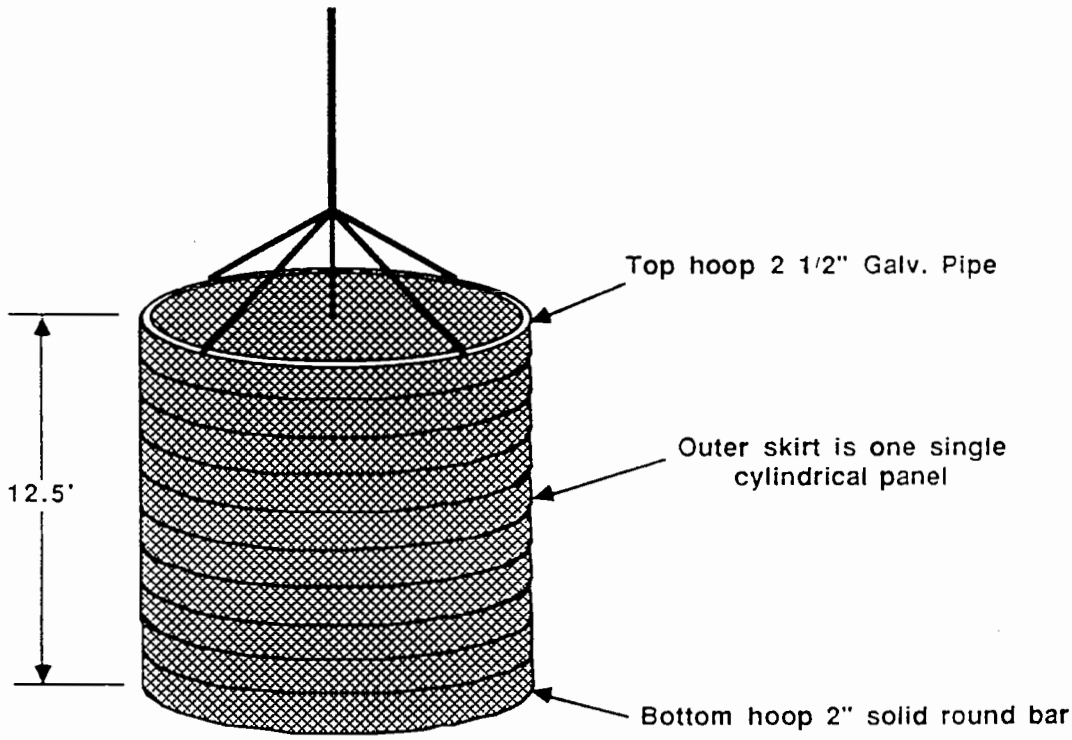
Assembled Growout Stack

785 Sq. Ft. of horizontal growing area



Scallop Enhancement Project

Schedule of Buoys

C. Goudey
8/25/94

No.	Name	Description	Lat. N.	Long. W.	Depth ft	Anchor lbs	Anchor line
1	NW Picket	4' dia. x 10' lighted	41°13'	70°40'	96	1500	200' chain
2	NE Picket	4' dia. x 10' lighted	41°13'	70°36'	100	1500	200' chain
3	SW Picket	4' dia. x 10' lighted	41°10'	70°40'	100	1500	200' chain
4	SE Picket	4' dia. x 10' lighted	41°10'	70°36'	104	1500	200' chain
5	W Sphere	3.5' dia.	41°12.6'	70°38.11'	98	2 x 2000	300' Syn. & chain
6	E Sphere	3.5' dia.	41°12.6'	70°37.89'	98	2 x 2000	300' Syn. & chain
7	Spar 1	2' dia. x 20'	41°12.6'	70°38.09'	98		
8	Spar 2	2' dia. x 20'	41°12.6'	70°38.07'	98		
9	Spar 3	2' dia. x 20'	41°12.6'	70°38.05'	98		
10	Spar 4	2' dia. x 20'	41°12.6'	70°38.03'	98		
11	Spar 5	2' dia. x 20'	41°12.6'	70°38.01'	98		
12	Spar 6	2' dia. x 20'	41°12.6'	70°37.99'	98		
13	Spar 7	2' dia. x 20'	41°12.6'	70°37.97'	98		
14	Spar 8	2' dia. x 20'	41°12.6'	70°37.95'	98		
15	Spar 9	2' dia. x 20'	41°12.6'	70°37.93'	98		
16	Spar 10	2' dia. x 20'	41°12.6'	70°37.91'	98		
17	Buoy AW	30" inflatable	41°12.25'	70°39.67'	98	250	175' Synthetic
18	Buoy AM	30" inflatable	41°12.25'	70°38'	99	250	175' Synthetic
19	Buoy AE	30" inflatable	41°12.25'	70°36.33'	100	250	175' Synthetic
20	Buoy BW	30" inflatable	41°12'	70°39.67'	98	250	175' Synthetic
21	Buoy BM	30" inflatable	41°12'	70°38'	99	250	175' Synthetic
22	Buoy BE	30" inflatable	41°12'	70°36.33'	100	250	175' Synthetic
23	Buoy CW	30" inflatable	41°11.75'	70°39.67'	98	250	175' Synthetic
24	Buoy CM	30" inflatable	41°11.75'	70°38'	99	250	175' Synthetic
25	Buoy CE	30" inflatable	41°11.75'	70°36.33'	101	250	175' Synthetic
26	Buoy DW	30" inflatable	41°11.50'	70°39.67'	98	250	175' Synthetic
27	Buoy DM	30" inflatable	41°11.50'	70°38'	99	250	175' Synthetic
28	Buoy DE	30" inflatable	41°11.50'	70°36.33'	101	250	175' Synthetic
29	Buoy EW	30" inflatable	41°11.25'	70°39.67'	98	250	175' Synthetic
30	Buoy EM	30" inflatable	41°11.25'	70°38'	100	250	175' Synthetic
31	Buoy EE	30" inflatable	41°11.25'	70°36.33'	102	250	175' Synthetic
32	Buoy FW	30" inflatable	41°11'	70°39.67'	99	250	175' Synthetic
33	Buoy FM	30" inflatable	41°11'	70°38'	101	250	175' Synthetic
34	Buoy FE	30" inflatable	41°11'	70°36.33'	102	250	175' Synthetic
35	Buoy GW	30" inflatable	41°10.75'	70°39.67'	99	250	175' Synthetic
36	Buoy GM	30" inflatable	41°10.75'	70°38'	101	250	175' Synthetic
37	Buoy GE	30" inflatable	41°10.75'	70°36.33'	103	250	175' Synthetic
38	Buoy HW	30" inflatable	41°10.50'	70°39.67'	99	250	175' Synthetic
39	Buoy HM	30" inflatable	41°10.50'	70°38'	101	250	175' Synthetic
40	Buoy HE	30" inflatable	41°10.50'	70°36.33'	103	250	175' Synthetic
41	Buoy IW	30" inflatable	41°10.25'	70°39.67'	100	250	175' Synthetic
42	Buoy IM	30" inflatable	41°10.25'	70°38'	102	250	175' Synthetic
43	Buoy IE	30" inflatable	41°10.25'	70°36.33'	104	250	175' Synthetic

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930

OCT 26 1994

William F. Lawless, P.E.
Chief, Regulatory Division
Operations Directorate
U.S. Army Corps of Engineers
New England Division
424 Trapelo Road
Waltham, Massachusetts 02254-9149

Dear Mr. Lawless:

This letter is in response to a proposal by Westport Scalloping Corporation to deploy and maintain a sea scallop aquaculture facility approximately eight miles south of Martha's Vineyard, Massachusetts (File# 94-02176). We offer the following comments.

Project Description

The purpose of this project is described in a U.S. Army Corps of Engineers' Public Notice, dated September 13, 1994, as the research and development of techniques for the capture, holding, transportation, seeding, husbandry, and harvesting of sea scallops. Two methods of raising scallops will be conducted. One method utilizes a single array of 10 lantern-style cages suspended 40 feet apart at various depths in the water column. This array will be secured by a two point mooring system at each end. The other method involves depositing scallops along grow-out lanes marked with buoys at each end and at midpoints. This technique requires no structural confinement.

The source of undersized scallops (40-60 mm) may include hatchery-reared stocks, however, for the purposes of this study, the primary source would be bycatch collected on commercial sea scallop draggers. The National Marine Fisheries Service (NMFS) understands the need to utilize this source given the availability of hatchery-reared juvenile sea scallops and the relatively short-term nature of this project (18 months). However, we do not consider this an acceptable source for projects of longer duration or other sea scallop aquaculture ventures. In order for this to become a sustainable industry that reduces rather than intensifies pressure on the species, the source of sea scallop spat would need to be hatchery-raised. Protecting wild stocks from a commercial effort to harvest undersized scallops would likely become a major issue if this form of aquaculture proved to be economically lucrative. This

matter needs to be addressed during the study since the current Atlantic Sea Scallop Fishery Management Plan does not prevent the harvest and transfer of scallops from one location to another.

Effects to the Benthic Environment

The effects of this project to the benthic environment should be minimal if good husbandry practices are employed. Stocking density could be a problem if scallops were densely concentrated, however, this is unlikely since scallops broadcasted into water depths of approximately 100 feet should disperse naturally as they settle to the bottom. Also, scallops are fairly motile and should spread out as necessary. If stocking density did become a problem, it should be identified during periodic dive monitoring.

The presence of natural predators such as sea stars and crabs are to be noted, but there is no expressed intention to remove any indigenous fauna from the area. The NMFS recommends that the disturbance to the benthic environment be kept to the minimum necessary and that marine predators be monitored, not removed, unless predation is found to be a significant problem. Prophylactic methods to remove predators should not be used.

A potential for disease or pathogen transfer exists if scallops are collected from areas outside the Gulf of Maine and Georges Bank, however, the probability of this is unclear. Unless it can be proven that the introduction of scallops from areas outside New England waters poses no threat to indigenous stocks, the collection of scallops for this study should be restricted to New England waters. In addition, the location and quantity of juvenile sea scallops retained by draggers for this project should be recorded and submitted to Westport Scalloping Corporation for inclusion in their final report.

Endangered Species

A number of species of endangered and threatened marine animals under the jurisdiction of the National Marine Fisheries Service may be present at the project site during certain times of the year. These include the northern right whale (Eubalaena glacialis), humpback whale (Megaptera novaeangliae), finback whale (Balaenoptera physalus), leatherback sea turtle (Dermochelys coriacea), green sea turtle (Chelonia mydas), loggerhead sea turtle (Caretta caretta), and Kemp's ridley sea turtle (Lepidochelys kempi). In addition, the harbor porpoise (Phocoena phocoena) is proposed for listing as threatened and may also be present at the project site. All of the whale species mentioned transit the area at certain times during the year on

their migrations to or from more northerly feeding and nursery areas. However, based on survey data (CeTAP, 1982) this area is not known to be a concentration area for whales or turtles. Many of the whales migrating through the area are adults with calves headed for the protection and seasonally abundant food resources of Cape Cod Bay. Protecting females with calves during their vulnerable springtime breeding period is particularly important in furthering the recovery of many of the endangered populations of whales. Juvenile and subadult loggerhead, green, and Kemp's ridley sea turtles prefer warmer water and are most likely to be in the area from mid-summer through fall.

Whales and turtles are known to have been entangled in lobster pot lines, seines, and fish weirs. Right whales are particularly vulnerable to entanglement in lines because of their propensity for surface feeding. Leatherback sea turtles are also commonly caught in lobster trap lines due to their lack of maneuverability upon encountering such obstacles.

The threat of entanglement in the buoyed lines used to delineate each lane as well as the lines supporting the suspended cage array is the foremost concern for all species involved. The concentration of scallops within the lanes may attract loggerhead turtles which are known to feed on mollusks and crustaceans. Green, Kemp's ridley, and leatherback sea turtles are less likely to be attracted to the site since their primary food sources are seagrass and algae, crabs, and jellyfish, respectively. The grow-out lanes and the suspended cage array system should pose little risk to the endangered species mentioned above as long as the number of lines to the surface do not exceed what has been proposed. If possible, the number of lines should be reduced.

We conclude that this project as proposed is not likely to adversely affect endangered species under the jurisdiction of the NMFS because: 1) the site is not a known concentration area for the species of concern, and 2) the expected impact from the structures associated with grow-out lanes and the cage array should be minimal in a pilot project of this size and duration. However, should project plans or specifications change or new information become available that alters the basis of this decision, then consultation must be reinitiated. If you have any further questions regarding endangered species please contact Laurie Silva at (508) 281-9291.

<u>Sea Scallop Aquaculture in the EEZ</u>

This project would cover a nine square mile area within the Exclusive Economic Zone (EEZ). In order for this project to be implemented successfully, it may be necessary to substantially limit fishing activity in the proposed area. To do this would likely require an amendment to at least the Atlantic Sea Scallop Fishery Management Plan promulgated as federal regulations under

the Magnuson Fishery Conservation and Management Act. Such an amendment would have to be developed and approved by the New England Fishery Management Council and ultimately by the NMFS; a process that could take several months.

Restricting an area within the EEZ for the exclusive use of aquaculture is an action that has, to date, never occurred in New England waters. Conflicting use concerns, and other issues such as the need to establish some form of leasing or licensing policy for the private use of public waters, should be addressed within the context of this study.

Please contact Eric Nelson at (508) 281-9118 with any questions regarding this letter.

Sincerely,

Signed: Christopher L. Mantzaris

for Jon Rittgers
Deputy Regional Director

Reference:

CeTAP. 1982. A characterization of marine mammals and turtles in the mid- and north Atlantic areas of the U.S. Outer Continental Shelf. University of Rhode Island under contract #AA551-CT8-48 to U.S. Department of the Interior.insert at end of letter:

cc: PR - Beach
PR - Silva
USFWS, Concord - Philip Morrison
EPA, Boston
MA DMF, Sandwich
[redacted]

The Re-engineering of the Scallop Industry

Summary

The following document describes an approach aimed at the development of a sustainable approach to scalloping in New England. Most of the text is based on a proposal submitted to the National Marine Fisheries Service for support under the Fishing Industry Grants Program. However, that proposed project is only part of a larger industry-based effort to insure the long-term economic stability of scalloping.

Fundamental to the success of this larger plan is the identification of coastal and offshore zones where culture activities or controlled husbandry and harvesting can occur. We call this concept of individual responsibility and control over a piece of the bottom "Sea Stead". As applied to the scallop industry, Sea Stead would involve less than 5% of the bottom. It would in no way detract from productivity on the other 95% but we believe that Sea Stead can and will yield economic opportunities that far surpass traditional wild harvest.

Through the establishment of individual responsibility, a range of opportunities emerge for the implementation of conservation and productivity-enhancing measures. New harvesting technology, full product utilization, and predictable landings can all follow. This is why our acquisition of the nine square-mile experimental site is so important to our immediate plans. Our application to the U.S. Army Corps of Engineers is viewed by many to be the first serious offshore "test case". Possibly more important is our request to the New England Fisheries Management Council to restrict fishing activities within the site.

For more information on Sea Stead, additional detail on project activities, or if you are interested in participating call either of the persons listed below.

Capt. Soren Henriksen, Westport Scalloping Corp. Phone: 508-997-4026
Cliff Goudey, MIT Center for Fisheries Engineering Research 617-253-7079
Ronald J. Smolowitz, Coonamesset Farm 508-564-5516

The Problem:

The New England fishing industry is facing hard times. The fish and shellfish resources the industry depends upon are seriously depleted. Proposed conservation measures will restrict catches at levels that will put many fishermen out of business and any remaining fishermen will be operating at lower levels of production. The ripple effects on the economy, including processors and suppliers, will be devastating. The value of the sea scallop industry to Southeastern Massachusetts easily exceeds half a billion dollars annually in good years. This could all be lost quite suddenly.

The decline of the scallop resource has been blamed on over fishing, usually thought of in terms of harvest removals. However, there are other fishing impacts that play significant roles. Frequent towing over the bottom impacts the productivity of the scallops and other species in ways we don't understand clearly. There is non-catch mortality to scallops caused by the dredge while on the bottom (i.e., mechanical damage, sediment suspension effects, etc.). There is the loss of value and spawning potential by harvesting small scallops. Existing management options can only address these problems by decreasing fishing effort which we believe will reduce employment and most likely lead to the consolidation of the industry in the hands of a few. A much better approach would be to expand the resource base.

There are possible alternative opportunities for the people and infrastructure that compose the fishing industry of southeastern Massachusetts. One of the most promising is sea scallop (Placopecten magellanicus) aquaculture. Many of the prerequisites for success exist. There is a large supply of small scallops, the infrastructure is in place, the unit value is high, and the market is established. Most importantly, the scallops can be reared on naturally occurring feed. The potential is vast, however, to re-engineer the scallop industry towards this sustainable approach much will need to be accomplished. This project represents a first step in a logical progression from today's wild capture fishery to one of husbandry.

We will first review the current status worldwide of scallop aquaculture and explain the possible approaches that can be used in southeastern Massachusetts to raise sea scallops for market. We will then identify problem areas and explain our approach to solving these problems.

Scallop Culture: - Background:

Scallop culture, as practiced today, was pioneered in the Mutsu Bay region of Japan (Aoyama, 1989). The scallop fishery in that area was subject to significant fluctuations in abundance; a factor common to most scallop fisheries including sea scallops. In 1935, Japanese researchers started on a program to overcome the fluctuations in scallop abundance. The early scientific efforts concentrated on ways to collect scallop spat; the stage in the scallop's life, after the planktonic phase, when it settles to the bottom.

By 1953, local fisheries cooperatives were collecting spat to reseed fishing grounds. In 1955, they started to hold the spat for short periods of time before reseeding in order to increase scallop survival. In 1964 a breakthrough occurred in spat collector design that significantly increased the number of spat collected. The increase in spat availability lead to improved methods to hold large numbers of scallops in captivity until fully grown (Ito and Byakuno, 1989). Today seventy percent of Japan's scallop harvest is cultured. The harvest is stable from year to year and is an order of magnitude larger than the previous wild harvest fishery. There are over 1900 scallop harvesting firms in the Mutsu Bay region alone and many other regions also produce cultured scallops.

Since the 1970's, countries in all parts of the world have begun scallop culture operations based on the Japanese model (Kirk, 1979; Paul et al., 1981; Reyes, 1986; Naidu and Cahill, 1986). Some depend on collecting spat, others use hatcheries to produce the spat. Canada has been working on culturing the sea scallop and is on the verge of successfully starting an industry based on culturing. The Canadian Ocean Production Enhancement Network (OPEN) may soon be funded by the federal Networks of Centers of Excellence program in the amount of $23 million to conduct a three part program; one part being scallop enhancement. While the world moves forward creating jobs and wealth through aquaculture, the United States finds itself importing cultured scallops.

Culturing:

Scallop culture operations depend on obtaining a large supply of spat, commonly called seed. Two sources of seed are hatcheries and spat collecting devices. Hatcheries usually collect sexually mature scallops from the wild population and spawn them in captivity. Scallops are easily induced to spawn by raising the water temperature (Gruffydd and Beaumont, 1972; Costello et al., 1973; Ito et al., 1975). There are variations in the rearing techniques, and different levels of difficulty, depending on the species of scallop. The Canadians are successfully spawning sea scallops in hatcheries and rearing them through the spat stage (Naidu et al., 1990).

The Japanese, however, have found that hatcheries are expensive to operate when compared to wild spat collection. Their culturing system depends on setting out spat collectors. The spat collectors consist of submerged longlines to which onion bags, stuffed with monofilament netting, are attached. The small swimming scallop larvae pass through the mesh of the onion bag and attach to the monofilament netting. After a month or two they detach but are now too large to pass through the onion bag mesh so they collect inside the bag.

Success of spat collection depends on locating the collectors at the right time and place. The Japanese have developed an efficient system for timing collector placement utilizing plankton surveys, oceanographic buoys, gonadal indices, and the blossoming of cherry trees (Ozaki et al., 1991). They usually harvest significantly more spat then they can utilize. An interesting consequence is that they select the

largest spat, which are the fastest growing, for the culturing operations. There is some indication that this selective process has shortened the time needed to culture the scallops to market size (Ito and Byakuno, 1989). The Canadians have tested spat collectors but have not yet attained the large catches as seen in the Japanese fishery (Naidu and Scaplin, 1979).

Intermediate culture:

Scallop spat usually range in size from a few millimeters to about 15 mm depending on the species and holding time. This size scallop, if placed on the bottom, suffer high mortality. Therefore most culture operations hold the scallops, in an intermediate culture phase, until the scallops are about 20-30 mm in size. The most common method of holding utilizes strings of specially designed pearl nets attached to arrays of submerged longlines. Holding the scallops in these nets, up off the bottom, reduces predation and provides better feeding conditions enhancing growth. The Canadians have held sea scallops for one year in the intermediate phase with success (Naidu et al., 1990). Occasionally cleaning of the nets is required during this period.

On the west coast of South America a culturing system was utilized that bypassed the spat collection and intermediate holding phases. Divers harvested scallops of intermediate size and brought them into shallow water where the scallops were held in corrals until grown to market size (Costello, 1985). This method has now been replaced with hatchery reared seed stock.

Final culture:

Final culture, or grow-out, can be conducted in a number of ways. Two general categories are cage culture and bottom culture (sea ranching). The most common form of cage culture utilizes a specially designed lantern net; a cylindrical cage of netting with about ten compartments stacked one on top of another. A specific quantity of scallops are placed in each compartment and the nets then placed on longline arrays. After a period of time, about one year, the scallops are thinned and usually placed into a larger mesh lantern net. There are many variations to this theme such as a scallop house (or pocket net) where each scallop has its own individual compartment (Dix, 1981). Other hanging culture methods include ear hanging where the scallop is tied to a string by means of a hole drilled in the hinge, or ear, of the shell. A third method involves gluing scallops to a hanging rope (Cropp, 1985). Obviously, these methods are very labor intensive.

The least expensive method of grow-out seems to be bottom culture (Frishman et al., 1980). Bottom culture does not require expensive nets or labor. The scallops are released onto appropriate bottom to grow to market size and, in some cases, the bottom has been cleared of predators such as crabs and starfish. Upon reaching market size the scallops are harvested by dredges or divers. Appropriate bottom is defined both by ecology and legal/regulatory constraints. The bottom needs to be suitable for scallop growth and have minimal amounts of predators. The bottom

should not be in conflict with other users. The bottom can be leased to individual operators who would own the scallops they seed. Another approach, commonly called resource enhancement, involves government supported seeding of common grounds.

Canadian efforts:

It is most appropriate to review what is publicly available on the Canadian efforts to raise sea scallops on the east coast. Canadian efforts on sea scallop culture began in Newfoundland in 1971 with the invitation of two Japanese experts to set up an experimental operation. Work also began at this time, at the Memorial University of Newfoundland, to produce seed scallops in the laboratory. In 1975, the Canadian government's Department of Fisheries and Oceans became actively involved in attempts at sea scallop culture, testing various techniques of spat collection and the impact on growth. By 1986, investigators succeeded in rearing scallop larvae in the laboratory through metamorphosis. There is evidence that some of the scallops caught in Newfoundland are from stock enhancement efforts (Naidu et al., 1990).

Large scale production of spat is underway at the Magdalen Islands Experimental Hatchery in Quebec, at the Marine Sciences Research Laboratory in Newfoundland, and at the Aquaculture Research Station in Halifax. One hundred thousand 1.0 mm seed scallops have been produced and transferred to the open sea for growth trials in Quebec. Scallops can reach spat stage in the laboratory in five weeks at 15 degrees C. Scallops do well in 5-15 degrees C but succumb to temperatures above 21 degrees C.

In one Canadian operation, at the end of the intermediate grow-out phase, the two year old scallops were placed into lantern nets. Survival in the lantern nets was estimated to be between 60-75 percent in years three, four, and five. Cages can be cleaned during grow-out with high pressure hoses. In Newfoundland, commercial size scallops have been grown in four years in cage culture vs. six years in the wild. Ear hanging has been tried but there are problems with fouling. Bottom culture is less expensive than other methods and the scallops reach commercial size within 3-4 years of transplanting.

The Canadians have found that the choice of a suitable site, for each phase of the aquaculture operation, is critical for success. Limiting factors include disease, toxins, water temperature, and predation.

Massachusetts - site-specific culture techniques:

For now, our project has a limited geographic range and a single species focus, *Placopecten magellanicus*. The work that will be accomplished will have wide ranging application into other geographic areas and species. However, successful scallop culture is site specific and thus there is a need to focus the research and development effort.

The fishing infrastructure that will directly benefit from this project includes both the New Bedford scallop fleet and their existing suppliers and processors upon which they depend for logistical support. The shellfish hatchery on Martha's Vineyard will participate in this project by providing hatchery reared spat from a separately funded effort. However, because we plan to emphasize the dissemination of information related to the project and our results the impact will be of much broader scope. The same specie and similar growing techniques may be appropriate for a large portion of the New England coast. And surely, some of the problems we confront and resolve will be provide useful guidance to others interested in similar undertakings.

This project focuses on the technology needed to culture scallops away from the crowded, and possibly polluted, coastal zone. One of the key principals we have adopted is the use of existing scallop industry infrastructure; personnel, vessels, and ports. Most of the scallops that will be used for stocking are those that are normally taken as bycatch in the commercial scallop fishery; i.e., often culled back overboard (40-60 mm shell height). We will hold and transport these scallops live to our test site.

Problem areas:

We have conducted an extensive literature search in order to identify potential problem areas in shifting from a wild capture to a husbandry based scallop fishery. The following is a brief synopsis of what are the major anticipated problems in addition to those of biology and engineering associated with rearing scallops.

1. Site Selection

This project plans to compare two types of grow-out technology; off-bottom culture (arrays) and bottom culture (lanes). The first problem was to determine where to locate the test site. Since the highest priority of this proposal is to test equipment and procedures in a relatively exposed location, candidate sites were plentiful. A site was needed where a specially designed grow-out array could be moored such that we could compare its operation to scallops placed nearby on the sea bottom. A location was identified that was relatively close to New Bedford (the fleet), Martha's Vineyard (the hatchery), and Woods Hole (the science base) but still exposed. Fishermen were surveyed to define a site free of most fishing activities. Surface traffic patterns were scrutinized. Bottom water temperature data was checked to confirm that the location did not exceed 18 degrees C in the peak summer months. Finally, scallops we learned that have been in the area in the past and are present more often in the heavily used areas to the east and west of the site that we finally selected.

2. Seed source:

Ultimately, efforts will need to be made to locate the best sites for spat collectors to determine if this methodology is appropriate for Southern New England.

Currently, plankton sampling performed by the National Marine Fisheries Service does not separate out sea scallop larvae from other bivalve larvae. There also is no routine examination of sea scallop gonad condition. Spat collection is not a major aspect of this proposal, but its potential can not be ignored. Basically, the existing research capabilities of NMFS and others would need to be reoriented or augmented to support scallop culture activities. We have reason to believe that high concentrations of scallop spat are seasonally present in the area (Merrill, 1965; Merrill and Edwards, 1976). Spat collectors will be set out at the project test site in the appropriate seasons to confirm the presence of scallop spat and other co-spawner activity. We will also be working closely with the Martha's Vineyard Shellfish Group on their attempts to produce seed scallops.

For the purposes of this project we will use wild caught intermediate size scallops (40-60 mm). This approach was used in Japan and Peru when these countries first started their scallop culture industries. Research has shown that scallops above 30 mm in shell height have a much higher chance of survival in bottom culture operations. In effect, this project is bypassing the seed problem in order to test water column culture vs. bottom growout technology.

3. Legal:

We will have to address the legal and regulatory problems associated with the issuance of a scallop leases. Much has been written about these problems, but little has been done to provide workable solutions needed to support the technologies presented in this proposal. We would like to see the government, both at the state and federal level, identify aquaculture zones in which simplified leasing arrangements can exist. A major part of this project will be to propose model law to set up such zones and to issue experimental leases. Competing uses and environmental parameters need to be addressed at this level. In Japan, fishery rights are given to fisheries cooperatives to conduct aquaculture operations in designated areas (Ozaki et al., 1991). Our project will test this concept by having eight commercial scallop companies share the test site.

4. Oceanography:

There is very little information available about the oceanographic conditions in potential culture areas. The Massachusetts Division of Marine Fisheries has some bottom water temperature monitoring stations in state waters, designed primarily with the lobster fishery in mind, that could be expanded to support scallop culture operations. There are other sources of data that need to be examined. After examining what is available, this project may propose a network of real-time oceanographic monitoring stations. Such information would benefit not only this enhancement/culture project, but also other activities. The vessels involved in this project will be equipped to collect data at potential sites identified by this project.

Specific Project Goals and Objectives:

1. Provide alternative economic opportunities for the New Bedford scallop industry.

The New Bedford scallop fleet is currently overcapitalized - too many boats fishing too depleted a resource. This project will demonstrate alternative usage for scallop vessels as tenders in open-ocean grow-out activities. The project will also work towards methodology to expand the resource base which in turn should support a larger industry.

2. Develop techniques for the optimal management of a scallop grow-out area.

This project will develop and demonstrate new, alternative techniques for improving scallop utilization. Today's practice of repeatedly dredging an individual scallop until it is large enough to shuck is both inefficient and wasteful. Their growth cycle is disturbed, they are smothered in sediments, and dredge and handling-induced mortality takes a high toll. Controlled harvesting in seeded areas, where most scallops are of known and near uniform size, minimizes the above effects. In our approach, scallops would be harvested once prior to seeding and once to keep. This reduction in dredging effort on individual scallops and over these controlled-fishing sites is the key to improved growth, better survival, and the restoration of the scallop resource.

3. Develop techniques for the capture, holding, transportation, and seeding of small scallops.

Essential to the previous goal is the development of methods to hold, transport, and seed undersized scallops. Scallops need circulating, oxygen-rich water and thermal stress must be avoided. This project will demonstrate cost-effective systems for holding live scallops and ways to effectively seed a grow-out site.

4. Propose a legal/regulatory regime (model law) for scallop operations.

The development of commercial-scale culture and grow-out operations is discouraged in this region due to a complicated regulatory framework and unclear policies. This project will explore the problem and identify changes or new legislation that would foster beneficial growth in near-shore and off-shore waters.

5. Identify potential scallop grow-out sites in New England.

Scallops, like other filter feeders, are attractive to culture due to the lack of an artificial feeding requirement. In both suspended and on-bottom situations scallops offer excellent potential to commercial growers. They are, however, sensitive to temperature and nutrient availability and siting of grow-out activities will be critical to the success of a venture. We will explore the region for potential grow-out

locations based on environmental conditions, conflicting use, and local regulations and infrastructure.

Project Participants:

Capt. Soren Henriksen, president — Westport Scalloping Corporation
113 MacArthur Drive
New Bedford, MA 02740

Capt. Henriksen will be responsible for the management of the participating vessels and grow-out site operations. Captain Henriksen has 45 years in the scallop business as a captain and boat owner in New Bedford and Alaska. In 1984 he spent 6 months in Peru establishing a successful scallop aquaculture program in cooperation with the University of Lima.

Ronald J. Smolowitz, engineer — Coonamessett Farm
227 Hatchville Road
East Falmouth, MA 02536

Mr. Smolowitz, a consultant in fisheries engineering and an expert in scallop harvesting, will assist the project manager in the running of the project. He will be responsible for developing scallop handling procedures, establishing detailed experimental protocols, and monitoring operations. He will also interface with the LMAH, Richard Karney, Dale Leavitt, and others on the biological and growth aspects of the project. He will have responsibilities for project reporting. He will oversee the assembly and installation of the live transportation containers. Ron was a NOAA Corps Officer for 20 years and during that time was involved in a wide range of fishing industry projects. Since leaving the NOAA Corp., he has engaged in numerous projects and collaborations on fishing and appropriate technology.

Clifford A. Goudey, engineer — Center for Fisheries Engineering Research
MIT Sea Grant College Program
Bldg. E38-372, 292 Main Street
Cambridge, MA 02139

Cliff will be responsible for engineering tasks of the project. He will be responsible for the specification of the hardware associated with the seeding site and the floating array and the development of specialized monitoring equipment. He will also engineer the modification to the two scallop vessels for their roles in the project and be responsible for the design of gear for site harvesting. He will design and see to the fabrication of the lighted picket buoys. He will be responsible for the water quality instrumentation, video observation equipment, and other underwater gear. He will share responsibilities for data analysis and project reporting with Mr. Smolowitz. Cliff is project director for the Center for Fisheries Engineering Research. He is an expert in fishing gear and offshore aquaculture systems.

Kenneth M. Riaf, attorney

6 Tolman Avenue
Gloucester, MA 01930

Ken will assist the project manager in dealing with legal and permitting issues. He will be responsible for evaluating areas in New England as potential sites for controlled scallop grow-out and array locations. He will be assisting the Conservation Law Foundation in the development of model law aimed at fostering and facilitating economic growth in this area.

Peter Shelley, Senior attorney

Conservation Law Foundation
62 Summer Street
Boston, MA 02110

Peter will head the Conservation Law Foundation's task of developing model law regarding controlled fishing sites within the region. This work will be aimed at recommending the appropriate controls and regulations that will allow sustainable utilization of scallops as well as other marine resources.

Gary Loverich, research director

Nor'Eastern Trawl Systems, Inc.
7910 N.E. Day Road West
Bainbridge Island, WA 98110

Gary will be responsible for the design and fabrication of the culture array. He will also specify anchor requirements. He will also assist in the development of array installation and servicing procedures.

Kurt Swanson, aquaculture Eng.

Nor'Eastern Trawl Systems, Inc.
7910 N.E. Day Road West
Bainbridge Island, WA 98110

Kurt will assist Loverich in the design and fabrication of the culture array. He will also assist in the development of array installation and servicing procedures. Kurt will be on-site to supervise installation.

Richard Karney, Shellfish biologist

Martha's Vineyard Shellfish Group
P.O. Box 1552
Oak Bluffs, MA 02557

Rick will be a member of the projects technical advisory panel. He will be working on spawning sea scallops in the Martha's Vineyard hatchery. Some of the scallop spat from his project, if funded, will be transported and held at our test site.

Roxanna Smolowitz, veterinarian

UPenn Laboratory for Marine Animal Health
Marine Biological Laboratory
Woods Hole, MA 02543

Roxanna, a veterinary pathologist, will be a member of the technical advisory panel

and also provide veterinary support to the project; primarily by performing necropsies on scallop mortalities and assessing the condition of survivors.

Dale F. Leavitt, biologist

Dept. Aquaculture and Fisheries
Woods Hole Oceanographic Institution
Woods Hole, MA 02543

Dale will be a member of the technical advisory panel and will provide biological support to the project primarily by conducting biochemical analysis of the scallop meats through the project period.

One of the goals of this project is to build the infrastructure in southern New England to support a scallop culture industry. All the project participants that have been identified by name will be part of a formal technical advisory panel that will be convened at least twice during the course of the first year; once before field operations get underway and once at mid-term. In addition, two Canadian scallop culture experts have expressed their willingness to participate in the project and will serve on the panel; Dr. Sam Naidu and Dr. Shawn Robertson of the Canadian DFO.

Research Plan:

1. Complete literature search

An extensive literature search has already been conducted at the applicants expense. Over sixty references have been acquired (see reference list), examined, and annotated. We will continue the literature search and information gathering in the areas of live transport, seeding, predators, predator control, optimal environmental conditions, habitat impact of scallop harvesting, and scallop culture. The completed literature search will be published as an annotated bibliography.

2. Site selection and permit applications

A preliminary test site has been selected ten miles south of Martha's Vineyard (Northwest corner of the site is 41-13 N; 70-40 W) with a water depth of 30 meters (see attached drawings). The test site is a 3 mile square (9 square miles). A review of NMFS survey data indicates that the water temperature should be ideal for scallop grow-out. The area is not a significant fishing ground. While there have been successful scallop sets in this area they have been infrequent. We suspect this has to do with spat survival. We have applied for a permit from the Army Corps of Engineers to set moorings, buoys, and our grow-out array in the test site. We have asked the New England Fishery Management Council to close the test site to commercial fishing for a 18 month period. A similar request will be pursued with the Commonwealth of Massachusetts if needed.

3. Moored grow-out array design and construction

A preliminary design of a large-scale scallop grow-out array has been completed in

collaboration with Nor'Eastern Trawl Systems, Inc. (NET Systems) of Bainbridge Island, Washington. NET Systems is the only company in the U.S. with experience in the design, fabrication, and installation of open ocean culture systems. Their Ocean Spar pen system is unique in the world with respect to its ability to withstand full ocean exposure.

The system we will be using takes advantage of the survivability and seakindliness of their spar buoys while incorporating the specific needs of scallop grow out. As shown in the attached drawings, the grow-out array is a series of spar buoys from which large circular netting trays are suspended. Though patterned after the Japanese lantern net, the size of our design sets it apart from anything previously employed. This size is intended to make effective use of a traditional scallop dragger as the array tending vessel. Each unit has 10 growing levels of 10' in diameter and a total of 785 square feet of growing area.

The design and materials selection for the grow-out units are aimed at durability, serviceability, and low cost. The spar buoy, suspension lines, and mooring lines have been designed conservatively to maximize the survivability of the array. Dual anchors at each end of the array offer redundancy. The number of grow-out units included in this experimental array is based on the needs of the experiment balanced against economic considerations.

4. Vessel Modifications

Two scallop draggers will be employed during this project to deal with logistics and other tasks associated with the site. Both vessels will require some modifications. The first vessel, the F/V Westport (LOA 98 ft), will be modified for installing and servicing the grow-out array. A set of grow-out unit support stanchions will be installed on the stern deck of the vessel. These posts will center the suspended unit on deck and allow the sequential servicing of the grow-out trays from all sides. One of the posts will hinge or drop, allowing the entry of the unit as it is swung aboard using the existing fixed booms. The deck area required for this system will require that it be removed for normal scallop dragging activities.

In addition to array handling, this first vessel will be used for live transport of scallops and for monitoring of the site. Live transport will be accomplished using pallet-sized, insulated on-deck containers fitted with water circulation and air bubblers. Site monitoring tasks will require that the vessel be fitted with a capability for lowering sensors through the water column and for taking bottom video recordings.

The second vessel, the F/V Concordia (LOA 116 ft), will be used for scallop harvesting, predator control, live transport, bottom seeding, and environmental monitoring. Modifications to the vessel will be confined to the fitting of on-deck insulated containers and their associated plumbing. Descriptions of both vessels are included in the appended material.

5. Site Preparation

The location of the project grow-out site is ten miles south of Martha's Vineyard. It is in 95 to 100 feet of water and is a square, three miles on a side oriented to the latitude lines. In order to adequately mark the nine square mile site, four picket buoys will be placed on each corner. These buoys will be steel and fitted with a radar reflector, storage batteries, a suitable light, and solar panels.

The suspended array will be near the northern edge of the site, aligned east and west. It will be deployed as early in the project as possible to allow a proper evaluation of the concept. The two participating scallop vessels will be used to set the anchors, buoys, and the grow-out units. The array will be set and observed for proper configuration for several weeks before any scallops are placed in the units. Mooring line or anchor adjustments will be made as needed.

The remainder of the nine-square-mile site will be used for seed bottom experiments with the exception of a quarter-mile wide buffer area around the perimeter. The entire grow-out area is divided into eight 1/4 x 2 1/2 mile lanes and each will be surveyed for depth and bottom type. An underwater low-light camera system and video recorder will be used to inspect each lane. Existing scallops, predators, and other bottom dwellers will be noted.

Some of the grow-out lanes will be pre-fished using a conventional New Bedford scallop dredge. Catch during these tows will be recorded and discards will be dumped off-site.

6. Scallop harvest, transportation, and seeding

Small scallop for introduction in the grow-out sites will be obtained in two ways. First will be through directed harvesting by the F/V Concordia and the F/V Westport. Undersized scallops, normally discarded, will be retained onboard. Depending on our success at keeping the animals alive, the retention of the small scallops may have to be confined to the last portion of the trip. Part of this fishing effort will be directed at known beds of small scallops known as "peanut piles". It is believed that extraordinary spat settling causes these areas of high density but growth in the congested spots is thought to be sub-optimal. It is also known that the known concentrations of small scallops are dragged over heavily. Currently there is no effort to allow this undersized stock to mature undisturbed. "If I don't. someone else will" is the accepted policy.

Seed from the two project vessels will be placed in grow-out lanes A and B. These two lanes will see the heaviest concentrations of seed scallop. Decisions on predator control will be made as the project progresses. Predator control may consist of trapping crabs.

Small scallops will be obtained from other cooperating vessels. The project will outfit six scallop draggers with on-deck live-transport containers. The vessels will

be chosen with the help of the Offshore Mariners Association. A portable version of the units to be used on the two principal vessels, each vessel so fitted will seed a designated spot as they return from their normal scalloping trips.

Each cooperating vessel will be assigned a grow-out lane. It will be theirs alone and they will be responsible for executing proper scallop handling and seeding techniques. At the end of the project, the vessel will be allowed to harvest what they have seeded or to wait an allow further growth. These cooperating vessels will be required to report all seeding and harvesting activity to the project manager. We plan to discuss this part of the project with the New England Fishery Management Council beforehand to develop management details for this activity.

Seeding will be done manually with crew members casting scallops overboard as the vessel steams a predetermined course down the grow-out lane. Seeding densities will be estimated by assuming the scallops land within a swath width equal to the water depth and later verified by underwater video. Seeding of a particular lane will continue until a specific density of animals is reached. Different densities and the effect on growth rates will be one of the parameter variations tested.

In theory, the potential carrying capacity of these grow-out lanes is tremendous. Each 1/4 mile by 2 1/2 mile lane has 22.5 million square feet. Even a modest stocking density of one scallop every 10 square feet would allow the placement 2.25 million seed scallops. In Japan, a seeding density of 2 scallops per square foot is not uncommon. The limiting factor in this phase of the operation will be the availability of small scallops and our ability to transport them in good condition.

7. Array loading, maintenance, and monitoring

After the grow-out array has been properly installed, the process of loading it with small scallops will be started. The F/V Westport will accomplish this task. Scallops will be graded by average shell size and count per bushel. They will be placed on the grow-out trays at specified densities.

Maintenance of the grow-out units will include periodic hauling and pressure washing of the trays and exterior netting. Numbers of animals per tray will be adjusted to explore the effects on growth rate. In addition, the depth of the grow-out units in the water column will be varied to learn the effects on unit productivity. The large size of the grow-out units is aimed at matching the tending capabilities of the servicing vessel. The size and hoisting capabilities of the F/V Westport would be wasted on smaller units.

Each unit has 10 growing levels of 10' in diameter and a total of 785 square feet of growing area. If we start with 30mm scallops placed at 10 animals per square foot, each unit will hold 7850 scallops. A subset of the scallops to be placed will be shucked for meat size analysis.

8. Monitoring of arrays and bottom grow-out sites

The grow-out units and the seeded lanes will be monitored for growth rates, general health, and mortality. Specimens will be removed from the array units during maintenance. Specimens from the bottom sites will be taken periodically by diver. These specimens will be transported in circulating tanks to the Laboratory for Marine Animal Health (LMAH) in Woods Hole. At the LMAH, scallops collected from each treatment group will be necropsied and evaluated histopathologically for condition. Additionally, moribund scallops from each treatment group will be examined for disease.

Additional samples will be taken for biochemical analysis of the adductor muscle in order to determine how the culture environment may affect the scallop meat. The samples will be analyzed for total lipids, protein, glycogen, and ash content. Scallop samples will be analyzed for biochemical composition at time 0, before deployment into the lantern nets and bottom lanes, and quarterly during the first year of the grow-out process. Fifteen scallops will be selected for analysis from each treatment at each time interval.

Bottom conditions under and surrounding the suspended arrays will be monitored for any changes caused by our activities. In addition to water column sampling, sediment samples will be tested quarterly for organic matter content.

The overall growth of the scallops in the bottom grow-out lanes will be determined using underwater video observation and direct diver sampling. This information will be used to direct further, graded seeding and to identify lanes requiring harvest.

9. Site harvesting

Harvesting of the suspended array will be done by the F/V Westport. Individual animals or entire trays will be removed for marketing. Shell size, live weight, and meat weights will be determined for all scallops harvested from the array. Since the cost and complexity of the suspended growout system can be justified only if high growth rates occur compared to bottom grow-out. Growth and end-product quality will be carefully noted.

All harvesting in lanes A and B will be done using a beam trawl to avoid the impact and mortality of the conventional dredge. This beam trawl will be made available to the six cooperating vessels as an alternative to their conventional dredges. In-situ observation of both conventional and beam trawl harvesting will be done using underwater video techniques.

10. Product Marketing

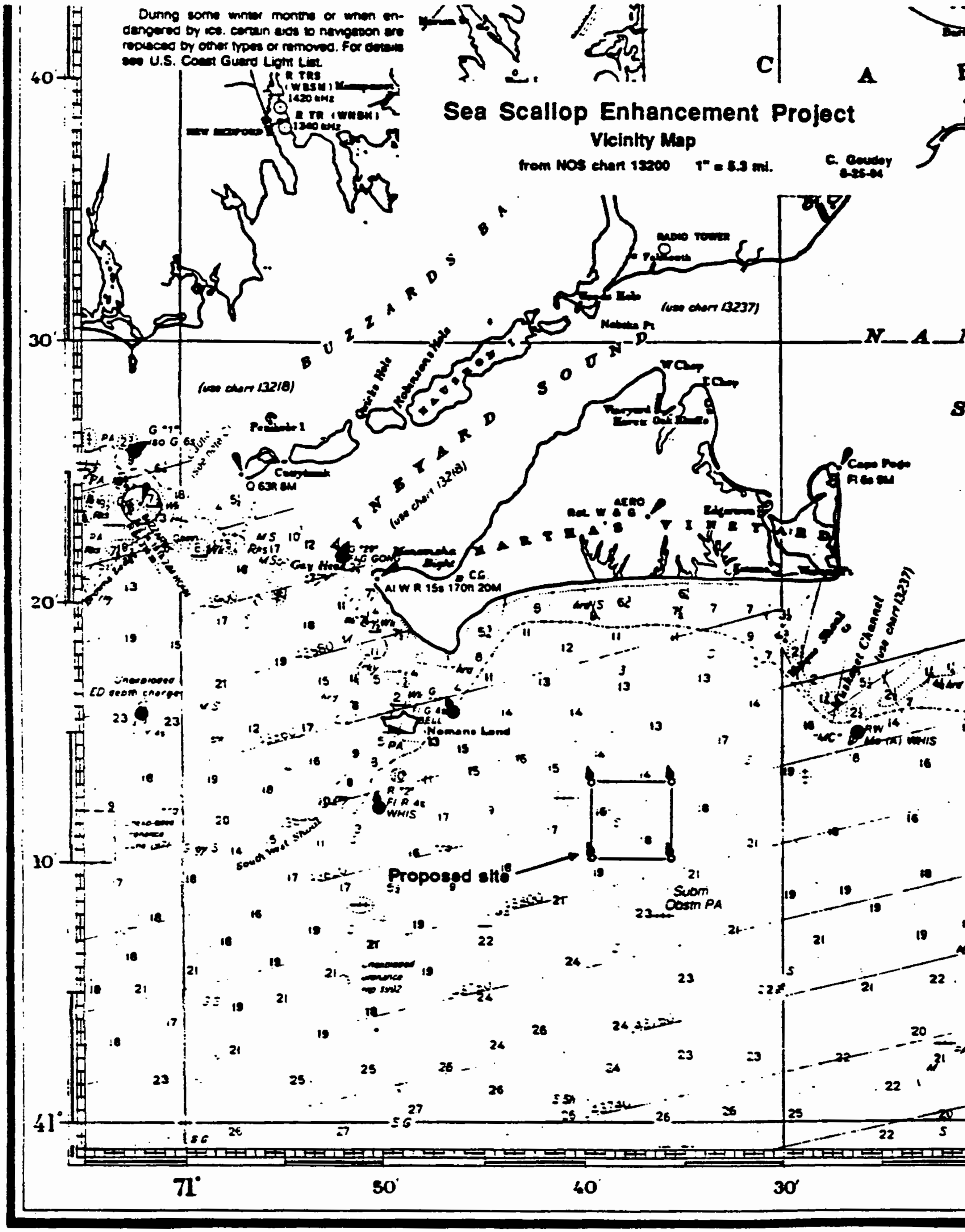
At this time no special plans have been made for marketing the scallops grown during the project other than through normal channels. If however, through efforts of others, a market develops for live scallops we will be prepared to exploit the opportunity.

11. Site selection

During the project data will be collected on the optimum conditions for scallop grow-out sites. As sites are identified in the region, suitable as grow-out or array locations, more detailed biological and environmental data will be collected from those sites using the two project vessels. The data search will also include commercial landings attributed to the sites in order to place a value on the current use.

12. Legal Regime

Conservation Law Foundation senior attorneys Peter Shelley and Richard E. Emmett will conduct an analysis of the legal, regulatory, and policy barriers to developing a federal leasing program for scallop enhancement/culture activities in the exclusive economic zone (EEZ). This analysis will survey state leasing programs for aquaculture and examine recent examples of efforts to secure navigation permits from the Army Corps of Engineers as well as the current federal regulatory programs applicable to mariculture. The attorneys will also draft model legislative language for a federal leasing program for enhancement/culture projects in the EEZ.



28th Ed. Sept. 11 93

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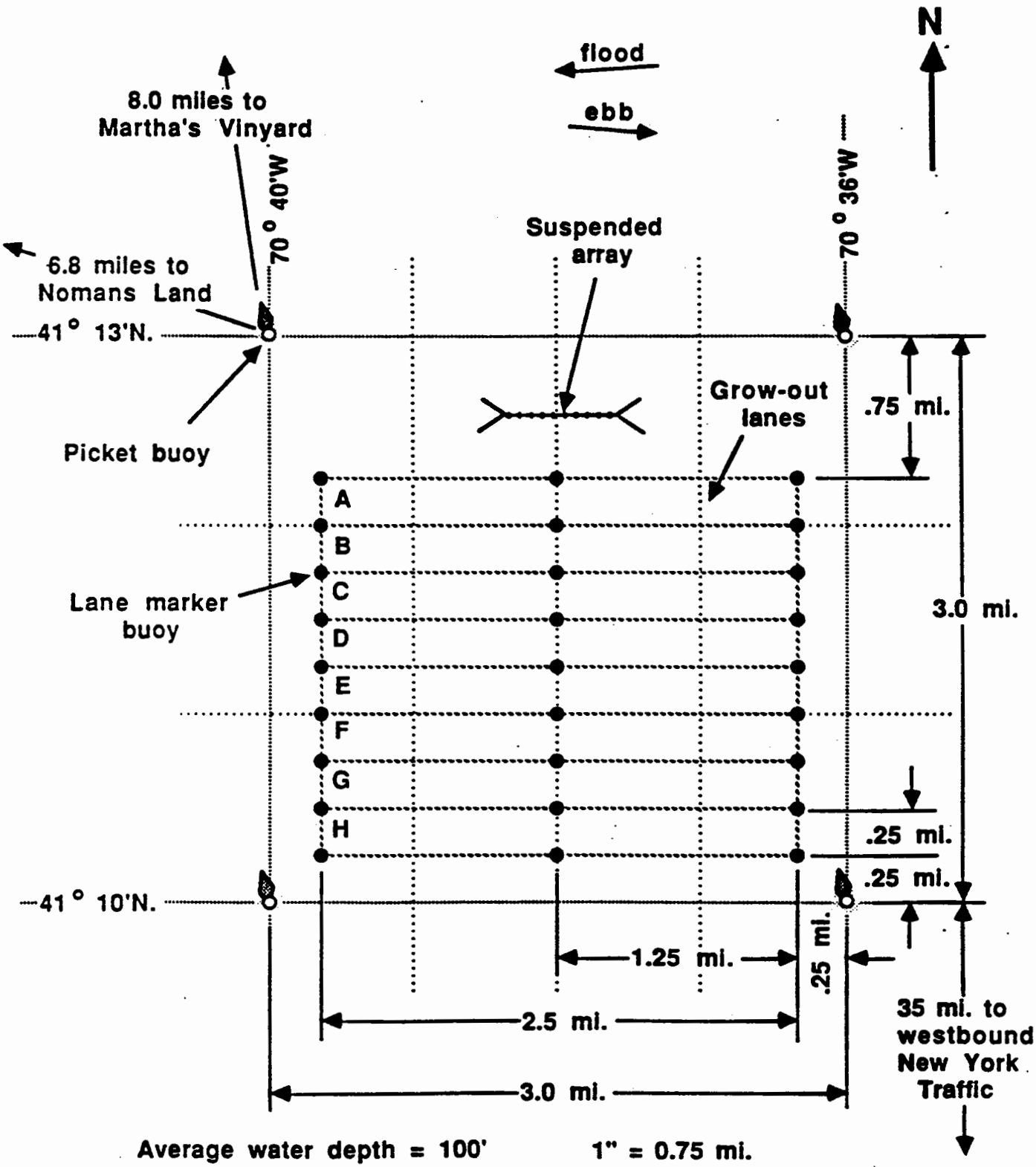
CAUTION

...Notice to Mariners published ... Hydrographic Topographic ... the Local Notice to Mariners ... Coast Guard ...

C. Goudey
8-25-94

Sea Stead

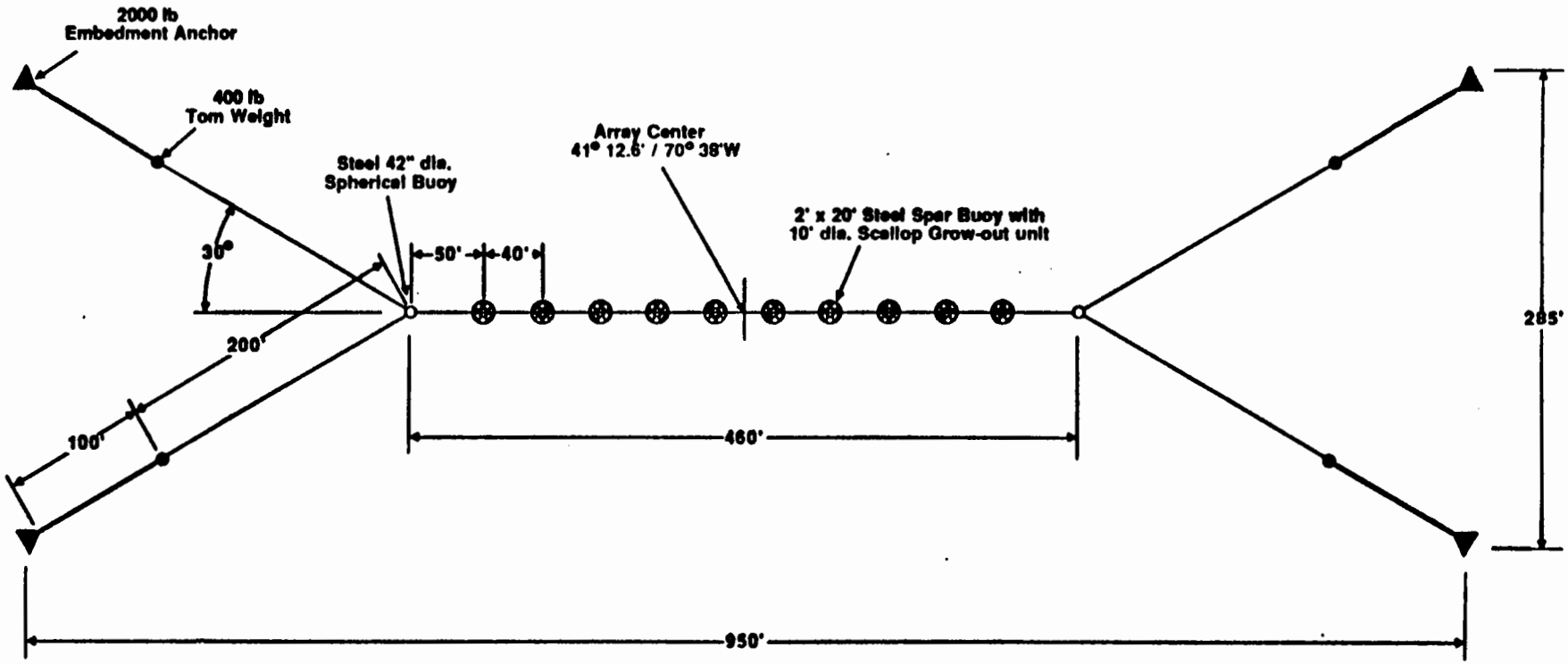
Muskeget 1 Grow-out Site



Sea Stead

Sea Scallop Grow-out System - Array Plan

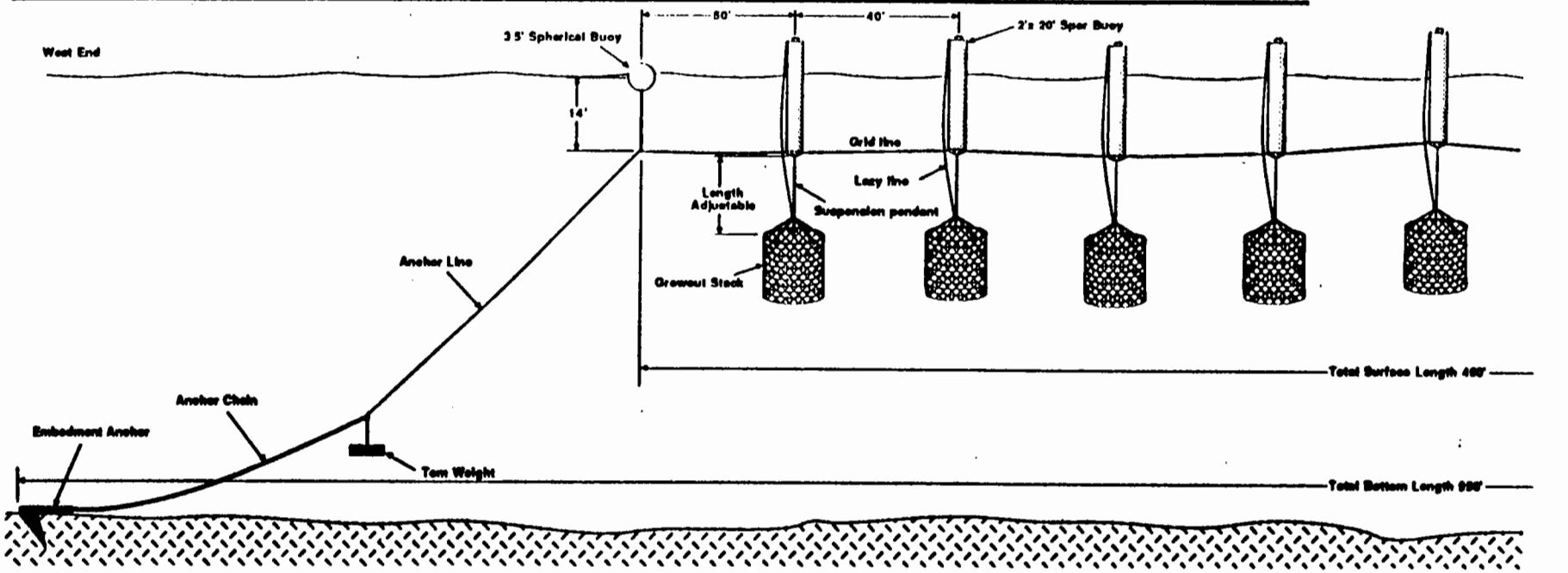
C. Goudey
8-25-94

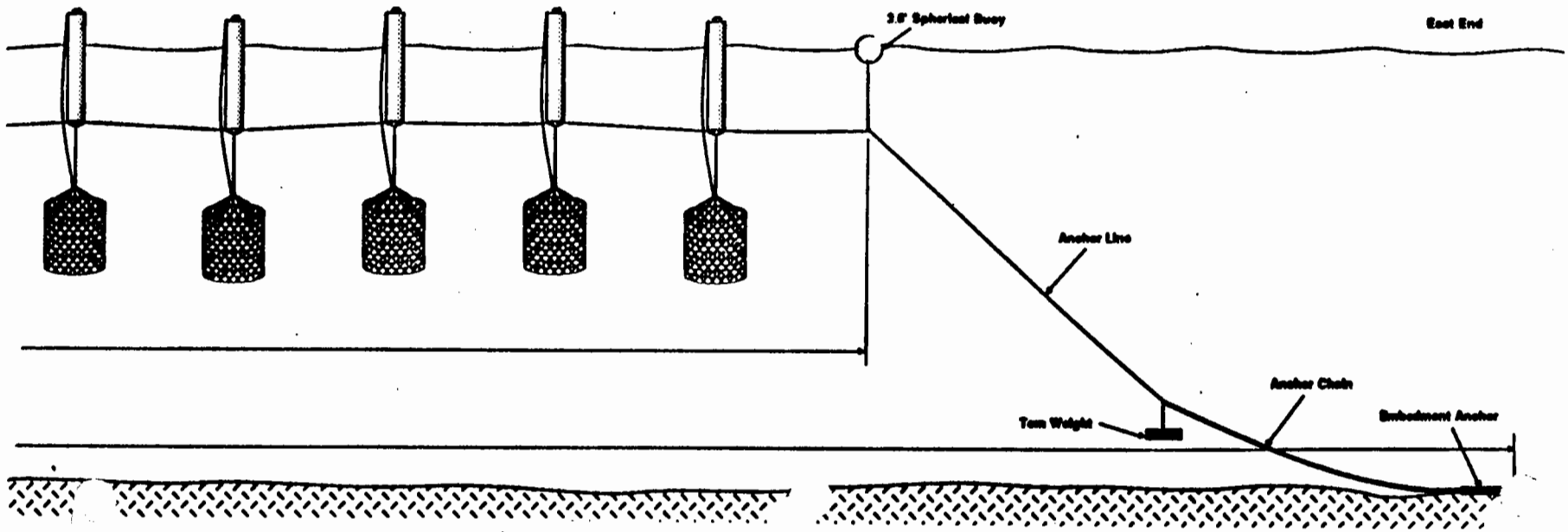


Sea Stead

Sea Scallop Grow-out System - Suspended Array Elevation

C. Goudey 8-25-94





DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02254-9149

REPLY TO
ATTENTION OF

JAN 13 1995

Regulatory Division
CENED-OD-R-94-02176

Westport Scalloping Corp.
113 McArthur Drive
New Bedford, Massachusetts 02740

Dear Sirs:

Enclosed are two copies of a Department of the Army permit authorizing the work described. Also enclosed is a Notice of Authorization, ENG form 4336, which must be conspicuously displayed at the work site. This notice will assist our field inspectors in determining that your work is authorized. This is a limited authorization containing a stated set of conditions which must be complied with. Please read the permit thoroughly, and familiarize yourself with its conditions. Although a contractor may perform the work for you, you are responsible for assuring the work is done in conformance with the conditions and limitations of this permit. Please be sure the person who will do the work also reads and understands the conditions of this permit.

Your signature is necessary to execute the permit. If the conditions are acceptable, please sign both copies and return one signed copy to us. A fee of $100.00 is required. Please enclose a check made payable to "FAO New England Division", and return it with the signed permit copy. Please write either your drivers licence or social security number on the top front of the check. If it is a business check, write either the signer's social security number or company's federal tax ID number.

Performing any work not specifically authorized by this permit, or failing to comply with its conditions, will subject you to the enforcement provisions of our regulations. Also note that this permit does not remove any requirement for state or local permits. This has the effect of making this permit unusable without these additional authorizations.

If any change in the plans or construction methods is found necessary, please contact us immediately to discuss modification of your permit. Any change must be approved before it is undertaken.

If this permit authorized work in wetlands, our verification of the wetlands jurisdictional delineations under the 1987 Manual is valid for three years from the date of this letter subject to any equity provisions that may be adopted as part of implementation of

the final revisions to the 1989 Manual. New information regarding physical site conditions may warrant revision within the three years. If construction has begun or there has been a substantial commitment of resources within the three years, the verification may be valid for an additional two years.

Condition 6 of this permit requires that you allow us to inspect the authorized activity. So that we may make timely inspections to insure compliance, please notify us at least two weeks before work will be commenced. To assist you in meeting this request, we have attached a notification form for you to fill out and return to us as soon as you are aware of when you intend to begin work.

Good luck with your project.

Sincerely,

William F. Lawless, P.E.
Chief, Regulatory Division
Operations Directorate

Enclosures

DEPARTMENT OF THE ARMY PERMIT

Permittee Westport Scalloping Corp., 113 McArthur Dr., New Bedford MA 02740

Permit No. 1994-02176

Issuing Office New England Division

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description:

Deploy and maintain buoys and tackle associated with a sea scallop grow-out facility in the Atlantic Ocean approximately 8 miles south of Martha's Vineyard, Massachusetts. The area demarcated by the four corner buoys is a square 3 miles on each side, located at coordinates as shown on the attached plans entitled: "MUSKEGET 1 GROW-OUT SITE" and "SCHEDULE OF BUOYS" in two sheets dated "8-25-94" and "11/28/94" respectively. The four corners of the site are marked by 48" diameter picket buoys equipped with radar reflectors and lights. 30" diameter inflatable lane marker buoys will be deployed within the interior of the square for use in project activities. Purpose of the project is the research and development of techniques for the capture, holding, transport, seeding, husbandry, and harvesting of sea scallops.

Project Location:

Atlantic Ocean south of Martha's Vineyard, MA

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on APR 1 3 1996. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

1. The permittee shall ensure that a copy of this permit is at the work site whenever work is being performed, and that all personnel performing work at the site of the work authorized herein are fully aware of the terms and conditions of the permit. This permit, including its drawings and any appendices and other attachments, shall be made a part of any and all contracts and subcontracts for work which affects areas of Corps of Engineers' jurisdiction at the site of the work authorized herein. This shall be done by including the entire permit in the specifications for the work.

(CONTINUED ON PAGE 4)

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

(X) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

( ) Section 404 of the Clean Water Act (33 U.S.C. 1344).

( ) Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

_____ _____

(PERMITTEE) *(DATE)*

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

_____ 1/13/95

(DISTRICT ENGINEER) *(DATE)*

JAMES C. WONG
ACTING DISTRICT ENGINEER

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

_____ _____

(TRANSFEREE) *(DATE)*

☆U.S. GOVERNMENT PRINTING OFFICE: 1986 — 717-425

If the permit is issued after the construction specifications but before receipt of bids or quotes, the entire permit shall be included as an addendum to the specifications. If the permit is issued after receipt of bids or quotes, the entire permit shall be included in the contract or sub-contract as a change order. The term "entire permit" includes permit amendments. Although the permittee may assign various aspects of the work to different contractors or sub-contractors, all contractors and sub-contractors shall be obligated by contract to comply with all environmental protection provisions of the entire permit, and no contract or sub-contract shall require or allow unauthorized work in areas of Corps of Engineers' jurisdiction.

2. The permittee shall report any incidental take of marine mammals pursuant to the 1988 amendment to the Marine Mammal Protection Act of 1972, as amended 16 USC S1372. For information, contact: Protected Species Coordinator, Habitat and Protected Resources Division, National Marine Fisheries Service, Northeast Region, One Blackburn Drive, Gloucester, MA 01930-2298; Telephone (508) 281-9254.

3. The project area shall be marked in accordance with Coast Guard requirements. Contact U.S. Coast Guard, Aids to Navigation Branch, Boston, (617) 223-8365 Attn: Bill Smith. Purpose of this condition is to minimize potential conflicts between fixed gear at the project site and general navigation in the area.

4. Scallops used in this project shall be limited to species indigenous to New England waters. Purpose of this condition is to preclude an inadvertent transfer of exogenous diseases and pathogens into the New England waters.

5. Scallops to be used at the project site shall be limited to those collected from the normal bycatch of conventional scallop dredging activities using regulation gear on grounds that are open for exploitation. Non-regulation gear shall not be used for this purpose except as expressly authorized by the New England Fisheries Management Council. The permittee shall maintain records as to the location, quantity, and size range of scallops which have been harvested and transported to the project site. Purpose of this condition is to protect wild stocks from a focused commercial effort to harvest undersize scallops.

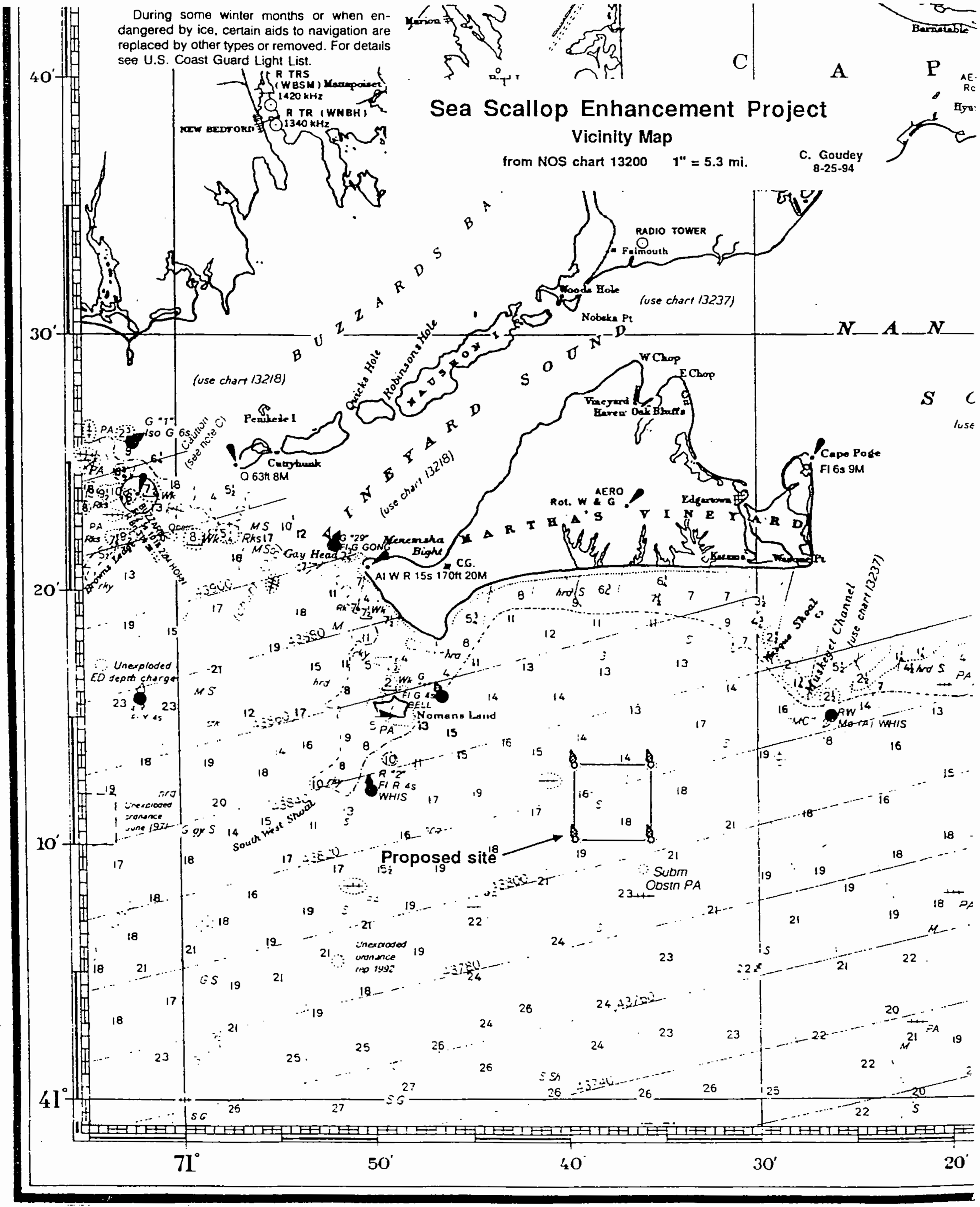
6. The permittee shall not remove marine predators from the project site without specific written authorization from the Corps. Neither shall he use any prophylactic means for purging the area of predators. Purpose of this condition is to protect native predator species from intensive methods of removal from the project site, insofar as the site may ultimately revert to a natural (unmanaged) state.

7. A summary report marked with the words "Permit #1994-02176" shall be submitted to: "Inspection Section, Compliance Branch, CENED-OD-R, U.S. Army Corps of Engineers, 424 Trapelo Road, Waltham, MA 02254-9149" at 12 and 18 months following the introduction of scallops into the project area. Submittals which are not marked and addressed in this manner may not reach their intended destination and do not comply with the requirements of this permit. At a minimum, the report shall contain the following information:

* source and size of scallops, and dates on which they were transported to the project site.
* results of any on-bottom inspections during the period.
* date, number and size of all harvests from the project site.
* any sightings of or encounters with marine mammals/reptiles
* information of interest to research into the culture of sea scallops.

Purpose of this condition is to document the results of this experiment in sea scallop culture, for use in possible future permit applications, and to make information of a general nature available to the public.

8. This authorization shall extend for a period not to exceed 18 months, beginning at the time that the first scallops are discharged into the project area. The purpose of this condition is to emphasize the permittee's stated objective to conduct an experimental activity, and to ensure that the transport of scallops from other open areas to this experimental area does not continue indefinitely.



28th Ed., Sept. 11/93

13200

LORAN-C OVERPRINTED

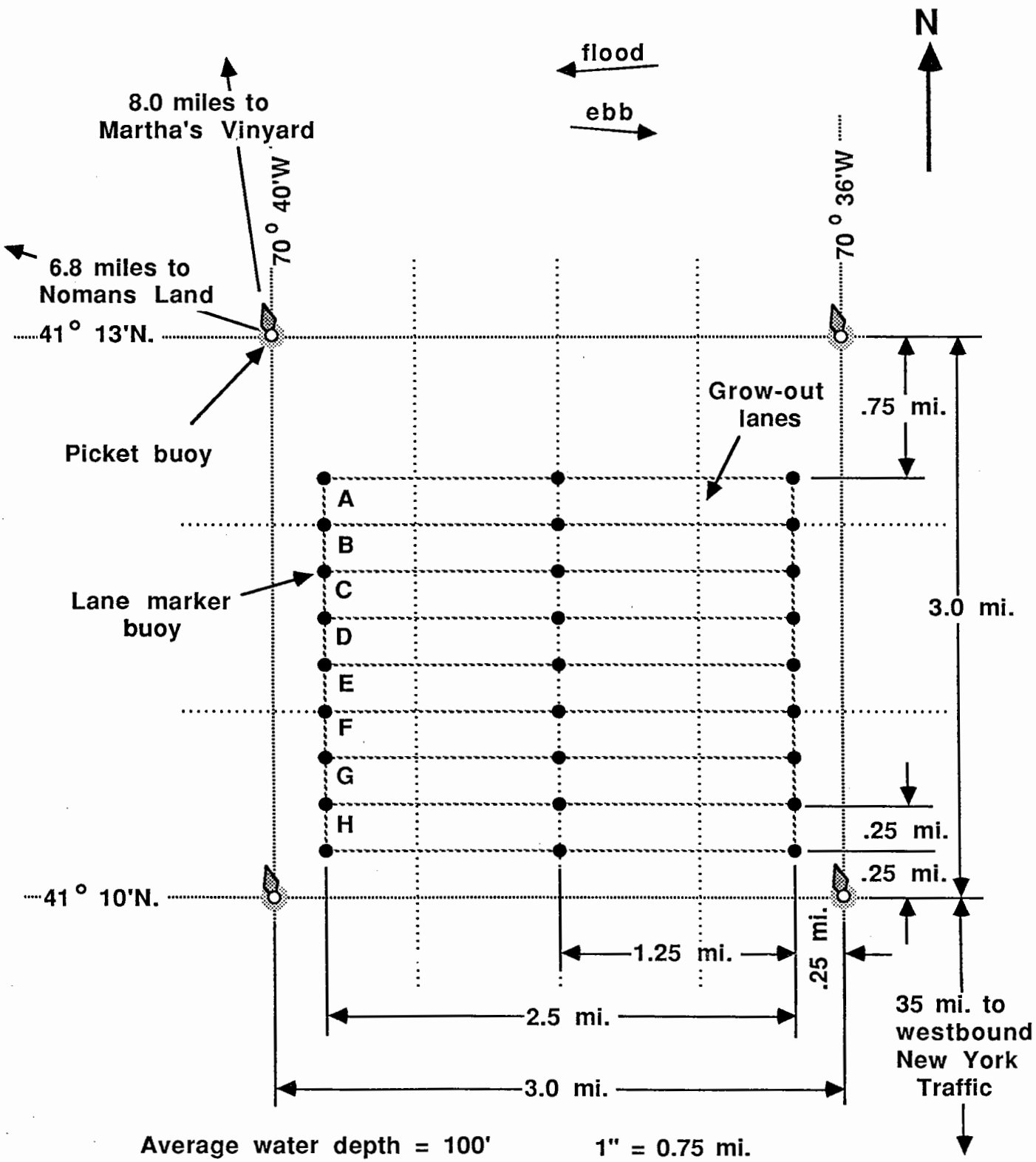
CAUTION

This chart has been corrected from the Notice to Mariners published ...

Sea Stead

Muskeget 1 Grow-out Site

C. Goudey
8-25-94



Scallop Enhancement Project

Schedule of Buoys

C. Goudey
11/28/94

No.	Name	Description	Lat. N.	Long. W.	Depth ft	Anchor lbs	Anchor line
1	NW Picket	4' dia. x 10' lighted	41°13'	70°40'	96	1500	200' chain
2	NE Picket	4' dia. x 10' lighted	41°13'	70°36'	100	1500	200' chain
3	SW Picket	4' dia. x 10' lighted	41°10'	70°40'	100	1500	200' chain
4	SE Picket	4' dia. x 10' lighted	41°10'	70°36'	104	1500	200' chain
5	Buoy AW	30" inflatable	41°12.25'	70°39.67'	98	150	175' Synthetic
6	Buoy AM	30" inflatable	41°12.25'	70°38'	99	150	175' Synthetic
7	Buoy AE	30" inflatable	41°12.25'	70°36.33'	100	150	175' Synthetic
8	Buoy BW	30" inflatable	41°12'	70°39.67'	98	150	175' Synthetic
9	Buoy BM	30" inflatable	41°12'	70°38'	99	150	175' Synthetic
10	Buoy BE	30" inflatable	41°12'	70°36.33'	100	150	175' Synthetic
11	Buoy CW	30" inflatable	41°11.75'	70°39.67'	98	150	175' Synthetic
12	Buoy CM	30" inflatable	41°11.75'	70°38'	99	150	175' Synthetic
13	Buoy CE	30" inflatable	41°11.75'	70°36.33'	101	150	175' Synthetic
14	Buoy DW	30" inflatable	41°11.50'	70°39.67'	98	150	175' Synthetic
15	Buoy DM	30" inflatable	41°11.50'	70°38'	99	150	175' Synthetic
16	Buoy DE	30" inflatable	41°11.50'	70°36.33'	101	150	175' Synthetic
17	Buoy EW	30" inflatable	41°11.25'	70°39.67'	98	150	175' Synthetic
18	Buoy EM	30" inflatable	41°11.25'	70°38'	100	150	175' Synthetic
19	Buoy EE	30" inflatable	41°11.25'	70°36.33'	102	150	175' Synthetic
20	Buoy FW	30" inflatable	41°11'	70°39.67'	99	150	175' Synthetic
21	Buoy FM	30" inflatable	41°11'	70°38'	101	150	175' Synthetic
22	Buoy FE	30" inflatable	41°11'	70°36.33'	102	150	175' Synthetic
23	Buoy GW	30" inflatable	41°10.75'	70°39.67'	99	150	175' Synthetic
24	Buoy GM	30" inflatable	41°10.75'	70°38'	101	150	175' Synthetic
25	Buoy GE	30" inflatable	41°10.75'	70°36.33'	103	150	175' Synthetic
26	Buoy HW	30" inflatable	41°10.50'	70°39.67'	99	150	175' Synthetic
27	Buoy HM	30" inflatable	41°10.50'	70°38'	101	150	175' Synthetic
28	Buoy HE	30" inflatable	41°10.50'	70°36.33'	103	150	175' Synthetic
29	Buoy IW	30" inflatable	41°10.25'	70°39.67'	100	150	175' Synthetic
30	Buoy IM	30" inflatable	41°10.25'	70°38'	102	150	175' Synthetic
31	Buoy IE	30" inflatable	41°10.25'	70°36.33'	104	150	175' Synthetic

This notice of authorization must be conspicuously displayed at the site of work.

United States Army Corps of Engineers

JAN 13 1995 19 95

A permit to Deploy and maintain buoys and tackle associated with a sea scallop grow-out

at Atlantic Ocean south of Martha's Vineyard, MA

has been issued to Westport Scalloping Corp. on JAN 13 1995 19 95

Address of Permittee 113 McArthur Drive, New Bedford, MA 02740

Permit Number

1994-02176

District Commander

ENG FORM 4336 , Jul 81 (ER 1145-2-303) EDITION OF JUL 70 MAY BE USED *(Proponent. DAEN-CWO)*

ENVIRONMENTAL ASSESSMENT AND STATEMENT OF FINDINGS

1. Applicant: Westport Scalloping Corporation

Application Number: 1994-02176

2. This permit action is being taken under authority delegated to the District Engineer from the Secretary of the Army and the Chief of Engineers by Title 33, Code of Federal Regulations, Part 325.8, pursuant to:

___X___ Section 10 of the Rivers and Harbors Act of 1899
_____ Section 404 of the Clean Water Act
_____ Section 103 of the Marine Protection, Research, and Sanctuaries Act

3. Description, location, and purpose of work: A sea scallop (Placopecten magellanicus) grow-out facility in the Atlantic Ocean approximately 8 miles south of Martha's Vineyard, MA. The proposed equipment would be deployed within a 3 mile square area in approximately 100 feet of water at coordinates shown on the attached plans. A 460' long 4-point moored string will support a grow-out array of spar buoys from which are suspended 10' diameter lantern nets (cylindrical cages with stacked interiors) whose tops are at least 14' below the surface. The surface termini of the string are marked by 42" diameter spherical buoys. This grow-out array is deployed near the northerly limit of the work area. The balance of the site is to be used for bottom culture grow-out lanes, 2.5 miles in length by 0.25 miles wide, with lane termini and mid-points being marked by 30" diameter inflatable buoys. The 4 corners of the site are marked by 48" diameter picket buoys equipped with radar reflectors and lights. A minimum 0.25 mile wide equipment/culture-free buffer area exists inside the project perimeter. Seed scallops will originate from nursery stock and from re-located undersize bycatch. Seed placement, husbandry and harvesting will be accomplished by participating commercial scallop draggers. Purpose of the project is the research and development of techniques for the capture, holding, transportation, seeding, husbandry, and harvesting of sea scallops.

4. Description of general environmental setting: The project site is in the open ocean, at an area where depths are approximately 100 feet. The bottom is characterized as hard to medium packed sand, and is believed to be relatively flat. Recent reports suggest that there is limited fishing in the area, although it is known that some lobster harvesting occurs within the boundaries of the site. Records show that sea scallops were

present at the site in the past.

5. Functions and values assessment of resources impacted: The suspended array may impact plankton carried through the area by currents, and fish, marine mammals, and sea turtles transiting the area. Benthic and in-benthic fauna may be impacted by the addition of transported scallops to the site, by settled metabolic wastes from the hanging array, and by harvesting activities of the bottom culture. All of these animals contribute to the health and biodiversity of the marine environment.

6. Sec 404 Mitigation MOA requirements: Not Applicable

7. Impacts to public interest factors:

+ Beneficial - Adverse 0 Negligible Effect

-/+ Water Quality -/+ Benthic Flora & Fauna
0 Land Use Classification
0 Wetlands 0 Water Supply and Conservation
0 Flooding 0 Historical 0 Energy Needs
+ Economics 0 Drainage 0 Air Quality
0 Aesthetics 0 Circulation Patterns 0 Noise
0 Wildlife 0 Erosion/Accretion 0 Safety
- Finfish/Plankton 0 Mineral Needs
+ Food and Fiber Production - Navigation
0 Floodplain Values 0 Recreation
0 General Environmental Concerns 0 Other
0 Property Ownership
0 Needs and Welfare of the People

Description of impacts (including short term, long term and cumulative impacts:

Water Quality: There may be some degree of degradation to the water column caused by metabolic by-products of scallops in the suspended array, and by re-suspension of benthic sediments as a result of harvesting activities. Periodic cage cleaning may temporarily discharge some fouling products into the water. All of these effects are considered to be so minimal as to be unmeasurable. In fact, the bottom harvesting activity at the site merely replaces that which would otherwise occur at some other location, as the returned undersize scallops were again dragged to the surface. Insofar as the bottom cultured scallops at the project site will be allowed to remain until they have achieved legal harvestable size, it can be argued that there will be a net reduction in overall bottom dragging, and a corresponding increase in water quality.

Benthic Flora & Fauna: There is no documented benthic flora at the project site. Some native species of fauna may be displaced

by the increasing density of scallops at the site. Others, notably predators, will benefit by the addition of prey species. There is no data to suggest whether or not there is a net benefit or deficit. As previously suggested, the reduction in repetitive dragging at other sites may have a positive impact on benthic flora and fauna in a larger sense.

Economics: The New England fishing fleet is under-utilized. To the extent that the resources of the industry can be re-deployed into a productive husbandry and harvesting activity, there is a net economic benefit to the region.

Finfish & Plankton: To some extent, phytoplankton will be ingested by the scallops in the suspended array. Insofar as these are new (as opposed to the relocated animals in the bottom culture) organisms in the area, there will be a net reduction of plankton, and a decrease in the food resource to some finfish species. These impacts are thought to be so small as to be unmeasurable.

Food & Fiber Production: By virtue of decreasing the number of times an undersize scallop is brought to the surface by a dragger, the overall mortality rate of the animals will decrease. In addition, scallops within the culture site will be grown out to some predetermined size, undoubtedly larger than they would have been had they been left at their original site. Both of these factors will have the affect of increasing the food production of the fishery.

Navigation: The suspended array and the site designation buoys may have an adverse impact on general navigation through the area. Coast Guard requirements will result in clearly visible corner buoys. The site will be noted on re-published coastal charts. There is very little commercial shipping through the area; it is not on any shipping lane. Most of the traffic in the area are local commercial fishermen, who will be quite aware of the existence of gear at the site. Interference with navigation should be minimal.

8. Findings:

a. State water quality certification: Not required

b. State coastal zone management concurrence: MA CZM advises that due to inadequate State policy with regard to aquaculture activities, they will decline to comment on the subject proposal. We consider this to be a waiver.

c. A public notice adequately describing the proposed work was issued on September 20, 1994 and sent to all known interested parties. All comments received are noted below and have been evaluated and are included in our administrative record of this

action.

d. General Evaluation: The following correspondence was received in response to the Public Notice:

National Marine Fisheries Service: By letter dated October 26, 1994, NMFS commented that they had concerns that the use of sub sized scallop bycatch as a source of stock for the project could encourage the exploitation of so-called "peanut piles" of undersize scallops, to the detriment of the species in the region. They also expressed concerns about the use of non-indigenous species, the removal of predators from the project site, and the need for reporting and documentation of the activities at the site. Regarding threatened and endangered species, they conclude that the "project as proposed is not likely to adversely affect endangered species under the jurisdiction of the NMFS".

Environmental Protection Agency: At the October 12, 1994 joint processing meeting at the Corps, EPA indicated that they would comment in writing by October 26, 1994 regarding public trust issues. They failed to do so.

U.S. Fish & Wildlife Service: By memo dated 10/12/94, expressed no objections to the proposed activity, nor had they any concerns regarding threatened or endangered species within their jurisdiction.

John A. Larson: By letter dated October 12, 1994, expressed concern that the proposed activity would conflict with his on-going lobstering in the area.

Wayne V. Iacono: By letter dated October 15, 1994, opposes the project, indicating that it will conflict with his use of the site for lobstering and cod fishing, and that others use the area for dogfish and scallop harvesting.

Town of Chilmark: By letter dated October 18, 1994, express opposition to the proposal, indicating that local fishermen traditionally fish the area for: codfish, winter flounder, yellowtail, monkfish, windowpane flounder, squid, butterfish, fluke, and lobsters. They are concerned that if the area is closed to other fishing, other (non-project cooperative) scallopers will work the perimeter of the project site, thereby interfering with local lobstermen's use of the area.

Herbert Hancock: By letter dated October 26, 1994, indicates opposition to the project, stating that he conducts lobstering at the site. He believes that if the area is closed, other scallopers will sweep the areas adjacent to the project on their way back to port, thereby conflicting with his lobster gear.

John S. Stephens: By letter dated October 31, 1994, opposes the

proposal in that he currently fishes the area for lobster and codfish.

Christopher J. Stier: By undated letter, expresses opposition to the proposal claiming that the area is currently very productive, in contrast to representations made by the applicant. He believes that lobstermen are already adversely affected by scallopers, and that this project would exacerbate that situation.

The Corps has a concern in regard to marine aquaculture proposals, that the applicant demonstrate that the design of all nets, pens, cages, mooring systems, etc., associated with the facility, are adequate to withstand expected operational and extremal conditions at the project site. The consequences of failure of an unattended cage system which has broken loose and is adrift, could be detrimental to general navigation, marine mammals and sea turtles. Accordingly, the applicant was requested to provide design documentation which would allow us to review his proposal for adequacy in this regard. The applicant indicated that this analysis would impose an unacceptable cost burden on him at this time, and decided to withdraw the suspended array portion of his application. He confirmed this by letter dated November 28, 1994.

The environmental impacts on the marine environment from project activities are believed to be minimal to the point of being unmeasurable. The depth of water will successfully dissipate any metabolic waste products emanating from the suspended array. The anticipated density of shellfish in the cages is low enough so that no appreciable reduction in plankton densities passing through the area will occur. The density of shellfish on the substrate during this relatively short experimental period is not considered to achieve sufficiently high levels as to interfere with other organisms in and on the bottom. Impacts from the eventual harvesting activity will be no greater than they would have been had the scallops been left in situ at their (former) native site. In summary, there should be no more than minimal impacts to the marine environment.

A number of species of endangered or threatened marine animals may be present at the project site during certain times of the year. NMFS has identified the following species: northern right whale (Eubalena glacialis), humpback whale (Megaptera novaeangliae), finback whale (Balaenoptera physalus), leatherback sea turtle (Dermochelys coriacea), green sea turtle (Chelonia mydas), loggerhead sea turtle (Caretta caretta), and Kemp's ridley sea turtle (Lepidochelys kempi). In addition, the harbor porpoise (Phocoena phocoena) is proposed for listing as threatened, and may also be present at the project site. NMFS has concluded (by letter dated October 26, 1994) that the project is not likely to adversely affect endangered species under their jurisdiction due

principally to low concentrations of animals in the area, and to the limited nature of suspended gear at the site. In order to document any incidental take of marine mammals, the following condition is added to the permit:

> *The permittee shall report any incidental take of marine mammals pursuant to the 1988 amendment to the Marine Mammal Protection Act of 1972, as amended 16 USC S1372. For information, contact: Protected Species Coordinator, Habitat and Protected Resources Division, National Marine Fisheries Service, Northeast Region, One Blackburn Drive, Gloucester, MA 01930-2298; Telephone (508) 281-9254.*

The Corps and the Coast Guard have a concern regarding the potential impacts of gear at the site on navigation in the area. There are no commercial transit lanes, so the primary vessels of concern are fishing boats. It is important that the site be well marked to avoid any gear conflicts. Accordingly, the following permit condition will be imposed:

> *The project area shall be marked in accordance with Coast Guard requirements. Contact U.S. Coast Guard, Aids to Navigation Branch, Boston, (617) 223-8365 Attn: Bill Smith. Purpose of this condition is to minimize potential conflicts between fixed gear at the project site and general navigation in the area.*

We agree with the NMFS concern with regard to scallop species imported from outside New England waters. The possibility exists that disease organisms, for which the native species have few defenses, might be introduced into the area. The following permit condition addresses this issue:

> *Scallops used in this project shall be limited to species indigenous to New England waters. Purpose of this condition is to preclude an inadvertent transfer of exogenous diseases and pathogens into the New England waters.*

NMFS also noted that this project could have the effect of encouraging the participating scallopers to locate sources of undersize scallops for the express purpose of providing stock for the bottom culture portion of the experiment. There are known sources of these small scallops, referred to as "peanut piles". It is clearly not in the interests of the scallop fishery or of the general scalloper community to allow this sort of targeting to occur as a result of this permit. It is difficult from a regulatory standpoint to implement a prohibition against fishing these resource areas. We have no means of knowing where the permittee's vessels are fishing. It seems more reasonable to reinforce the requirement that only standard gear be used in these harvesting efforts. The larger ring size currently required of scallopers will ensure that specific targeting of these resources

will be relatively unproductive. The following permit condition is added:

> *Scallops to be used at the project site shall be limited to those collected from the normal bycatch of conventional scallop dredging activities using regulation gear on grounds that are open for exploitation. Non-regulation gear shall not be used for this purpose except as expressly authorized by the New England Fisheries Management Council. The permittee shall maintain records as to the location, quantity, and size range of scallops which have been harvested and transported to the project site. Purpose of this condition is to protect wild stocks from a focused commercial effort to harvest undersize scallops.*

NMFS expresses a concern that the operators of this project could be inclined to attempt to clear the substrate within the project area of scallop predators, in order to maximize their harvest. Insofar as this project is experimental in nature, and that the applicant clearly seeks an authorization for a limited period, we believe that measures should be taken to assure that the area is not substantively changed from its pre-project state. Accordingly, the following condition is imposed:

> *The permittee shall not remove marine predators from the project site without specific written authorization from the Corps. Neither shall he use any prophylactic means for purging the area of predators. Purpose of this condition is to protect native predator species from intensive methods of removal from the project site, insofar as the site may ultimately revert to a natural (unmanaged) state.*

The proponent proposes to utilize scallops from the public domain to conduct an experiment. If the experiment proves successful, others should be provided with an opportunity to learn from the experience. In order to facilitate the the sharing of information with regard to this project, the following permit condition is added:

> *A summary report shall be submitted to the Corps (Attn: Regulatory Division, Compliance Branch) at 12 and 18 months following the introduction of scallops into the project area. At a minimum, the report shall contain the following information:*
>
> ** source and size of scallops, and dates on which they were transported to the project site.*
> ** results of any on-bottom inspections during the period.*
> ** date, number and size of all harvests from the project site.*
> ** any sightings of or encounters with marine mammals/reptiles*

** information of interest to research into the culture of sea scallops.*

Purpose of this condition is to document the results of this experiment in sea scallop culture, for use in possible future permit applications, and to make information of a general nature available to the public.

As noted, the applicant has applied for authorization of his activity for a limited period, specifically, 18 months. He clearly acknowledges the experimental nature of the proposed project. In order to reinforce the time-limited nature of this authorization, the following permit condition is imposed:

This authorization shall extend for a period not to exceed 18 months, beginning at the time that the first scallops are discharged into the project area. The purpose of this condition is to emphasize the permittee's stated objective to conduct an experimental activity, and to ensure that the transport of scallops from other open areas to this closed area does not continue indefinitely.

Much of the correspondence received in response to the Corps' Public Notice, argued against the project on the basis that the project area was productive habitat for other fisheries, most notably, lobstering. The writers argued that the expropriation of the project area for the exclusive commercial use of the applicant, constitutes an unjust intrusion into what had been heretofore, public waters, open to all. The Corps acknowledges that there is an issue requiring the reconciliation of competing uses of the area, but believes that the deliberations attendant to this permit decision are not the proper forum for adjudicating this matter.

The New England Fisheries Management Council (NEFMC) has clear authority under their current regulations, to address such matters. The Interspecies Committee of the Council serves as a forum for the airing of the many issues which arise in the fishing industry with regard to conflicts between various subgroups within the industry. Issues such as gear conflicts within areas are routinely discussed within this body, with motions to resolve conflicts being carried back to the full Council for action. The NEFMC has the authority to publish draft rules, hold public hearings, and to publish final rules with regard to competing uses for the sea's limited resources. By means of an amendment to the Atlantic Sea Scallop Fishery Management Plan, the Council has the authority to declare a Special Management Area for the proposed work, and to close the area to other fishing uses. Enforcement of this rule, by statute, falls to the NMFS and the U.S. Coast Guard. In fact, the applicant's request that the project area be closed to other fishing uses is currently under consideration by the

Interspecies Committee.

The Corps believes that it is inappropriate to engage in deliberations with regard to the issues of competing uses for the project area, as part of the decision-making process being undertaken herein. The NEFMC has the clear authority to adjudicate this aspect of the applicant's proposal, and we believe that it is prudent on our part to yield to their clear authority to resolve the issues. The Corps' authorization will be limited to the deployment of buoys and structures associated with the facility.

e. The EPA regulations published as "General Conformity Rule" (58 FR 63214, November 30, 1993) to implement section 176(c) of the Clean Air Act for non-attainment areas and maintenance areas require that Federal actions, unless exempt, conform with the Federally approved state implementation plan. The impacts on air quality associated with the regulated activity described in this EA/SOF (discharge of dredged or fill material into waters of the U.S. (Section 404 of the Clean Water Act); and/or work in or affecting navigable waters of the U.S. (Section 10 of the Rivers and Harbors Act); and/or the transportation of dredged material for disposal in ocean waters (Section 103 of the Ocean Dumping Act)) have been considered and are expected to cause only de minimis increase in emissions. Therefore, the regulated activity is exempt from the requirements of the General Conformity Rule.

f. The rationale for the Corps of Engineers limiting its scope of analysis to emissions associated with the regulated activity is based on the fact that it is not practicable for the Corps to control indirect emissions and the Corps has no continuing program responsibility over the entire activity.

g. I find that based on the evaluation of environmental effects discussed in this document, the decision on this application is not a major federal action significantly affecting the quality of the human environment. Hence, an environmental impact statement is not required.

h. I have considered all factors relevant to this proposal including cumulative effects. Potential factors included conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, consideration of property ownership and, in general, the needs and welfare of the people. After weighing favorable and unfavorable effects as discussed in this document, I find that this project is not contrary to the public interest and that a Department of the Army permit should be issued.

for DISTRICT ENGINEER — DATE 1/19/95

WESTPORT SCALLOPING CORPORATION
113 MacArthur Drive
New Bedford, MA 02740
(508) 996-0525 * FAX 991-3227

January 11, 1996

Mr. William Lawless
Chief, Regulatory Division
Operations Directorate
New England Division
Army Corps of Engineers
424 Trapelo Road
Waltham, MA 02254-9149

Re: Permit Number 1994-02176

Dear Mr. Lawless,

By this letter, Westport Scalloping Corporation is requesting a time extension of its permit for eighteen months starting April 13,1996 (the date specified in general conditions 1., Form 1721). This is in keeping with the original intention of starting the clock when work commences on the site (special condition 8). At this time field work has not started due to delays in the New England Fishery Management Council process.

The Council will be holding a public hearing on the project on January 19, 1996 (see attached notice). The Council then plans to vote on a scallop plan amendment to allow the project to move forward on January 25, 1996. We expect an affirmative vote which would mean another 90 days before final approval. If all goes according to plan we will be ready to place scallops into the site by late May, 1996.

While there have been some delays, the project is still moving ahead. We thank you for your support and we will keep you posted on progress as required in the permit conditions.

Sincerely,

Ronald Smolowitz
Project Manager

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02254-9149

REPLY TO ATTENTION OF

February 5, 1996

Regulatory Division
CENED-OD-R
1994-02176 Mod 1

Ronald Smolowitz
Westport Scalloping Corp.
113 McArthur Drive
New Bedford, MA 02740

SUBJECT: Sea Scallop Aquaculture Area - Martha's Vineyard, MA

Dear Mr. Smolowitz:

In accordance with your correspondence dated January 11, 1996, your Department of the Army permit number 1994-02176 is hereby amended (Mod 1) as follows:

> **General Condition Number 1 of the permit is amended to read: "The time limit for completing the work authorized ends on January 13, 2000, or on the date determined by Special Condition Number 8 of the permit, whichever occurs first."**

All conditions of the original permit remain in full force and effect.

BY AUTHORITY OF THE SECRETARY OF THE ARMY:

J. Michael Bradbury
Lieutenant Colonel, Corps of Engineers
District Engineer

Copy Furnished:

Eric Nelson
Habitat & Protected Resource Division
National Marine Fisheries Service
1 Blackburn Drive
Gloucester, MA 01930

MIT Sea Grant College Program
Center for Fisheries Engineering Research

FAX Message

Page one of five

Date: 13 December 1996

To: Ron Smolowitz
Coonamesset Farm
227 Hatchville Road
East Falmouth, MA 02536

FAX: 508-564-5073
Phone: 564-5516

From: Cliff Goudey,

FAX: 617-258-5730
Phone: 253-7079

Subj. Experimental site

What follows is a copy of a fax sent to the ACOE today completing what Grant needs for okaying the site.

I have a call in to Bill Smith at C.G. aids to navigation to discuss the ligh requirements, if any. I will argue for radar reflectors only.

With respect to the buoys, I think we have some credibility to gain by putting out professional-looking units. We have a significant amount in the budget for them so a proper sand-blasting and paint system is definitely in order. The previous owners should be able to give us guidance on a suitable anchor/chain combination. I suspect that 150-200 feet of 3/4 " chain would be appropriate for each

I am loose on Monday, Wednesday pm, and Friday for possible involvement in hauling them to Fairhaven.

MIT Bldg. E38-372, 292 Main Street, Cambridge, MA 02139
Phone: 617-253-7079 Fax: 617-258-5730 email: cgoudey@mit.edu

MIT Sea Grant College Program
Center for Fisheries Engineering Research

FAX Message

Date: 13 December 1996

To: Grant Kelly
US Army Corps of Engineers
FAX: 617-647-8303
Phone: 647-8491

From: Cliff Goudey
MIT Sea Grant
FAX: 617-258-5730
Phone: 253-7079

Subj: Permit #1994-02176

Our Amendment to the Sea Scallop FMP has been approved and the federal register period closed without event. According to the NMFS regional offices, the regulations closing the new site will be published soon. The prerequisite experimental fishing permits have also found their way successfully through the NMFS process. At long last, our project can become a reality.

What follows is the revised description of activities planned in the new site that was missing from my 7 August 1996 letter. In addition, I am including a site drawing, indicating the location of the various components of the experimental activity and a section from NOS chart 13218 showing the general vicinity.

Activities in the Project Area

Due to the type of experimentation planned in the experimental site, restrictions have been put in place by the NEFMC and NMFS on the types of fishing activities that can be allowed within the project boundaries. The following activities will not interfere with the conduct of the research or the results of the experiment and will be allowed:

1) Sea scallop culture, growth, research, and monitoring activities by project participants.
2) Scallop seeding, sampling, and harvesting by project participants.
3) Vessel transit.

Some activitied have been determined to be compatible with the experimental plans of the project but due to the potential for occasional conflicts, the activities must be coordinated with certain experimental procedures. The conduct of the following activities will require NMFS permission and will be subject to occasional displacement in specific locations andbased on the project schedule:

1) Lobster trapping.
2) Pot fishing.
3) Pole fishing and jigging.
4) Longlining.

Because of the potential for disruption of the planned experimental activities, certain fishing activities are prohibited in the area:

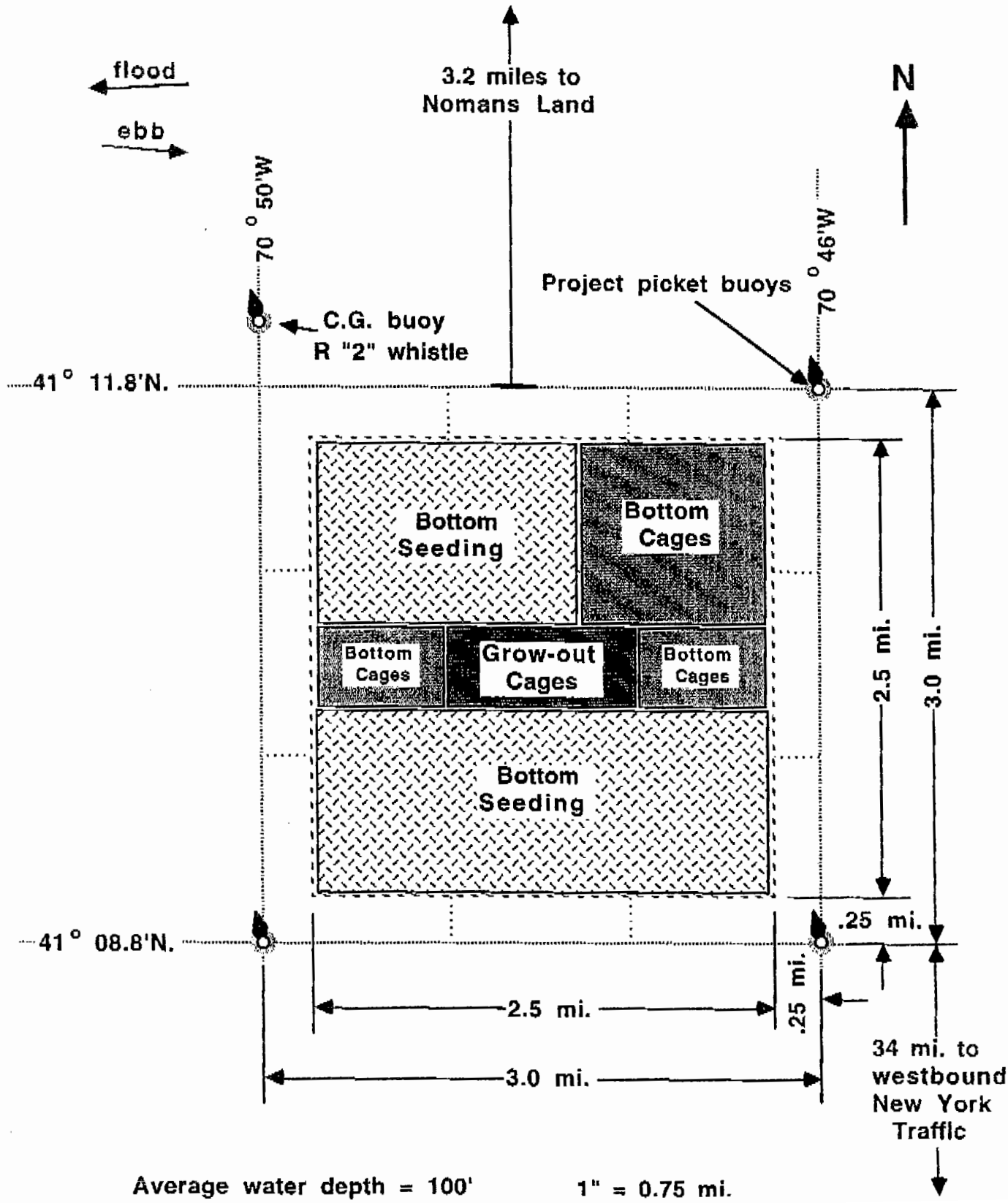
1) Otter trawling, mid-water trawling, and other related mobile fishing gear use.
2) Shellfish dredging.
3) Gillnetting.
4) Anchoring, except in emergencies
5) Discharging not in accordance with MARPOL regulations.

The new site plan includes a 1/4 mile buffer zone between the site boundary and any project-related installations. Some adjustment of the detailed component locations may be made based on our planned side-scan survey of the site. I will keep you informed of such changes and project progress in general.

Thank you for your assistance.

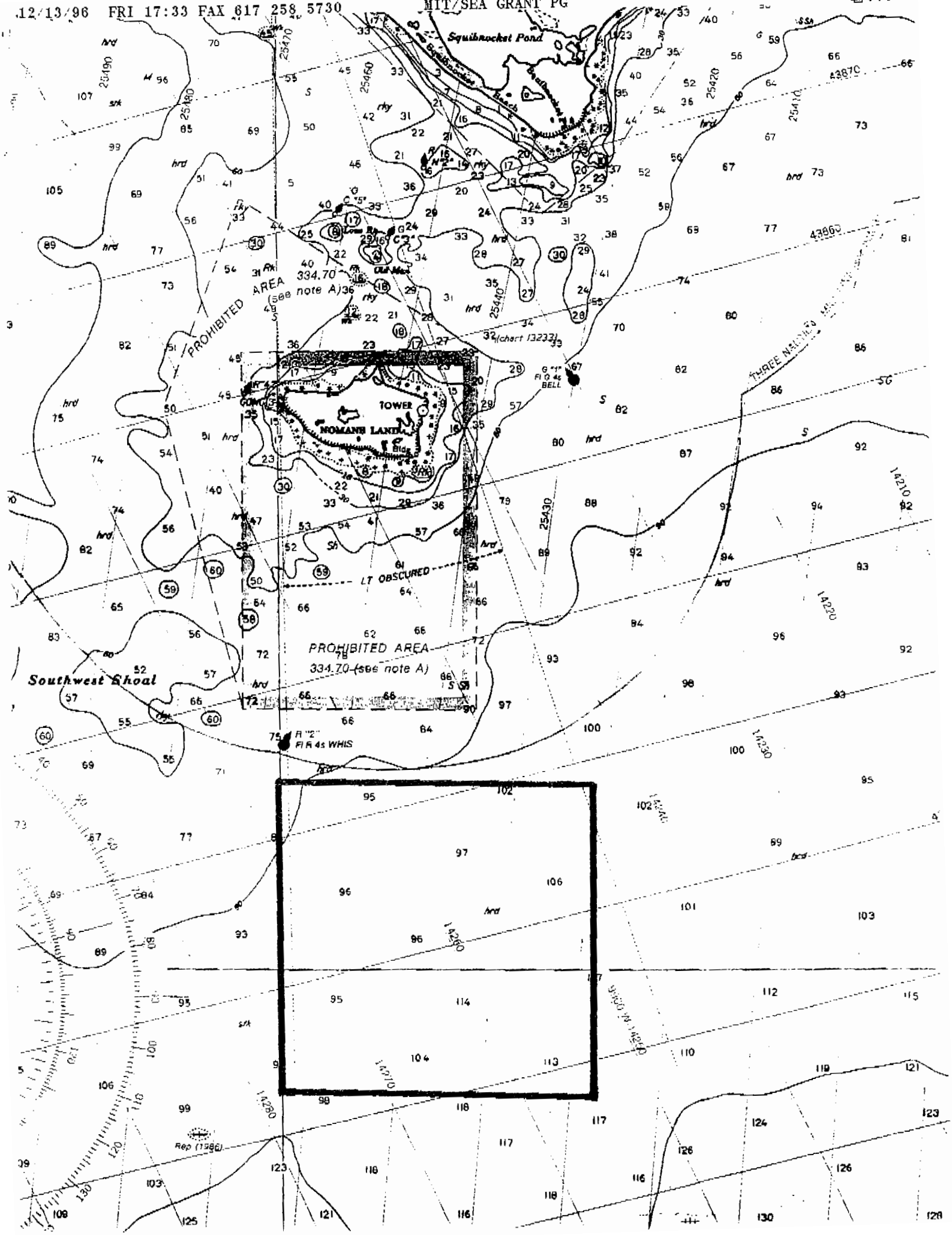
Sea Scallop Experimental Area

C. Goudey
12-13-96



Average water depth = 100'

1" = 0.75 mi.


Squibnocket Pond
PROHIBITED AREA
334.70 (see note A)
(chart 13233)
TOWER
NOMANS LAND
LT OBSCURED
PROHIBITED AREA
334.70 (see note A)
Southwest Shoal
THREE NAUTICAL MILES
Rep (1986)

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02254-9149

REPLY TO
ATTENTION OF

January 10, 1997

Regulatory Division
CENED-OD-R
1994-02176 - Mod 2

Cliff Goudey
Westport Scalloping Corp.
113 McArthur Drive
New Bedford, MA 02740

SUBJECT: Sea Scallop Aquaculture South of Martha's Vineyard, MA

Dear Mr. Goudey:

In accordance with your correspondence dated August 7 & December 13, 1996, your Department of the Army permit number 199402176 is hereby amended (Mod 2) as follows:

> PROJECT DESCRIPTION is amended to reference plans entitled: "SEA SCALLOP EXPERIMENTAL AREA" and "SUSPENDED GROW-OUT CAGES" dated "12-13-96 & 7-22-96" respectively, copies attached.

The purpose of the change is to relocate the project area somewhat to the south of its original location, and to extend the authorization to the deployment and maintenance of suspended grow-out gear within the water column at the site.

This authorization is subject to the following special conditions:

> 1. The number of suspended cages shall be limited to 10 of the size and deployment depth range shown on the plan.
>
> 2. Spacing between adjacent suspended cages shall be a minimum of 200'. Both conditions are intended to limit the density of lines and gear in the water column in the interests of marine mammals.

All conditions of the original permit remain in full force and effect.

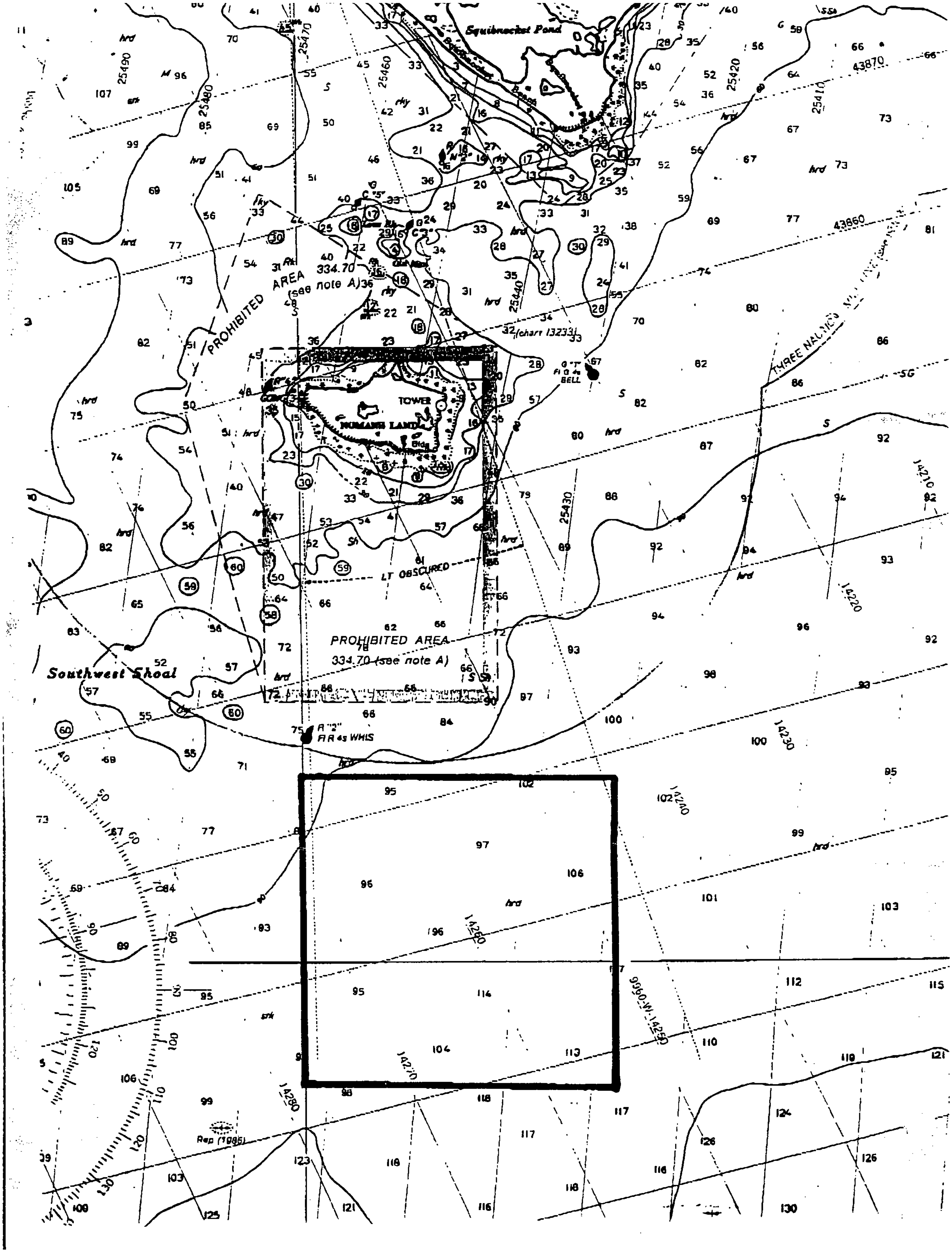
BY AUTHORITY OF THE SECRETARY OF THE ARMY:

J. Michael Bradbury
Lieutenant Colonel, Corps of Engineers
District Engineer

Faxed to
Ron
1.22.9

Enclosures

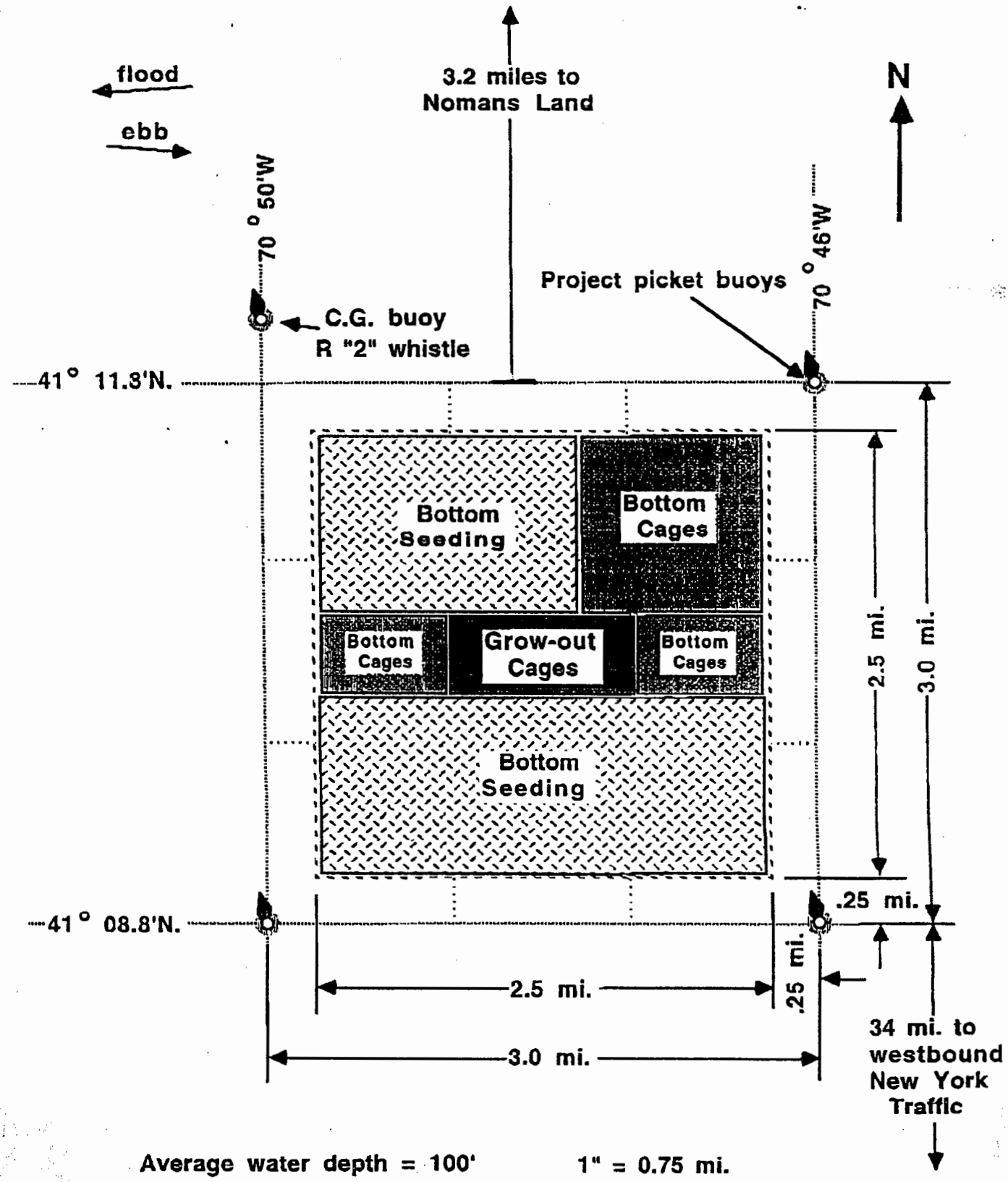
Copy Furnished: John Caskey, NMFS



Squibnocket Pond
PROHIBITED AREA
334.70 (see note A)
(chart 13233)
TOWER
NOMANS LAND
G "1"
Fl G 4s
BELL
LT OBSCURED
PROHIBITED AREA
334.70 (see note A)
Southwest Shoal
R "2"
Fl R 4s WHIS
Rep (1985)

Sea Scallop Experimental Area

C. Goudey
12-13-96

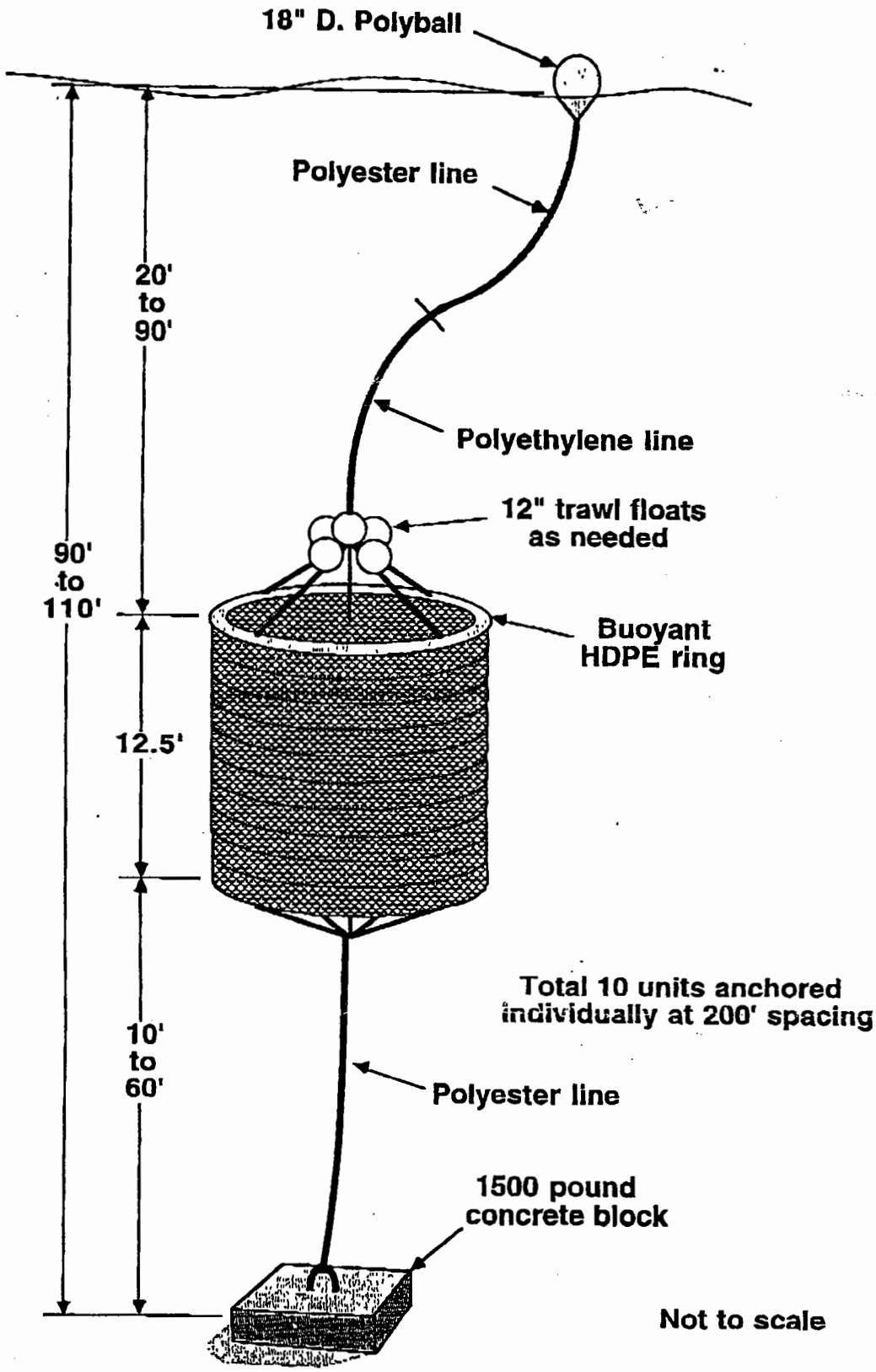


Average water depth = 100'

1" = 0.75 mi.

Suspended Grow-out Cages

C. Goudey
7-22-96



APPENDIX I

Sea Scallop Working Group

SeaStead Project

Coonamessett Farm

COONAMESSETT FARM
277 Hatchville Road
East Falmouth, MA 02536
508-564-5516
FAX 508-564-5073

January 12, 1994

SEA SCALLOP PRODUCTION

A group (see attached list), representive of the Massachusetts aquaculture and fishing industry, met in Congressman Studd's Hyannis office on January 11, 1994. The group focused on how to best proceed to develop a sustainable sea scallop industry based on enhanced production techniques. The group reached concensus on the following points:

1. It would be useful to formalize an industry directed consortium to provide a forum for coordinating activities related to the goal of enhancing sea scallop production. The consortium would have a board of directors including representation from industry, state and federal government, academic, and environmental interests.

2. There are many possible ways of attaining the objective of enhanced sea scallop production and it would be difficult at this time to predict the best approach. Emphasis needs to be placed in establishing the framework to allow individuals and groups to proceed at an experimental level.

3. Government leaders need to direct state and federal programs to support the goals of the consortium either by reorienting existing programs or by providing new funding.

4. Government agencies should be directed to work with the consortium to identify areas in state and federal waters that can be used for well-monitored experiments to enhance sea scallop production.

November 17, 1994

Mr. Peter Shelley
Conservation Law Foundation
62 Summer St.
Boston, MA 02110-1008

Dear Mr.Shelley;

Thank you for agreeing to attend the Sea Scallops Meeting scheduled for Monday, December 5, 1994 from 9:30 AM to 3 PM at the offices of the Cape Cod Economic Development Council, Barnstable Municipal Airport, 480 Barnstable Road, Hyannis, MA. Our host will be Mr. John O'Brian , Director of the Cape Cod Economic Development Council.

The need to address issues about aquaculture in Massachusetts has never been more evident .Reports that have appeared in our local and national press regarding the crises in our fishing, the need to create new jobs, the promise supplied by aquaculture, and the unique resources available in marine biology in this state to support aquaculture. The following organizations agree that this is an unique opportunity to provide leadership in Massachusetts for aquaculture and endorse this initiative:

Biotechnology Center of Excellence Corporation
Cape Cod and Islands Farm Bureau
Cape Cod Economic Development Council
Northeast Aquaculture Center - USDA
Policy Center for Marine Biosciences and Technology
Representative Gerry Studds
Sea Grant Program - Woods Hole Oceanographic Institution

To achieve this goal we need to identify aquaculture opportunities unique to this area, identify the critical deterrents for this specific Aquaculture, address regulatory problems, and prepare educational materials about aquaculture for regulators, practitioners and the general public. Sea Scallops have been selected as the aquacultural project to promote.

Our goal is two fold. First, a critical meeting is planned for the spring of 1995 which will involve develop a consensus program for sea scallop aquaculture in Massachusetts, will involve all the relevant constituencies and utilize key resource to develop an overall action plan. Second, and more immediate, to plan for this spring meeting we need to identify the opportunities available, the current barriers, and recommended solutions to these in our Dec. 5th meeting. We are pleased that you will join us in this process and look forward to seeing you on Dec. 5th..

Harlyn O. Halvorson
PCMBT
(508) 540-1030

Ronald Smolowitz
Coonamessett Farm
(508) 564-5516

AGENDA

SEA SCALLOP WORKSHOP
9:30 AM - Noon March 27,1995
Cape Cod Economic Development Council
480 Barnstable Road, Hyannis, MA

TENTATIVE AGENDA

1. **Welcoming Remarks**
   Mr. John O'Brien, CCEDC
   Mr. Mark Forest, Representative Studds Office
   Dr. Dale Leavitt, Sea Grant
   Mr. Ron Smolowitz, Coonamessett Farm

2. **State Initiatives** — **Mr. William Blanchard***
   White Paper
   Working Groups

3. **State Sen. Rauschenbach's Bill on Aquaculture** — **Ms. Pat Eldridge**

4. **Update SEA STEAD Project** — **Mr. Ron Smolowitz**

5. **Barnstable County Aquaculture SWAT Team** — **Mr. Bill Burt***

6. **NMFS Working Paper** — **Mr. Chris Mantzaris**

7. **Joint Subcommittee on Aquaculture: Aquaculture Research and Development: Strategic / Implementation Plan (via Dr. H. Parker)** — **Dr. H. O. Halvorson**

8. **Senate Bill 39 by Stevens, Kerry and Murkowski: To amend the Magnuson Fisheries Conservation and Management Act.**
   Hearings on Reauthorization, Boston. March 4, 1995 — **Mr. Mark Forest***

9. **OTA Aquaculture Project** — **Dr. Rollin Johnson**

10. **Canadian Aquaculture Development Strategy** — **TBA**

11. **Plans for Next Meeting** — **Halvorson, Leavitt**

ADJOURN

*** Invited**

Sea Scallop Workshop Program
CAPE COD COMMUNITY COLLEGE
July 24 - 25, 1995

Monday July 24 9 AM

Welcoming Remarks: John O'Brien Director Cape Cod Economic Development Council
Introductory Remarks: Harlyn O Halvorson Director, PCMBT

Session I: Sea Scallop Culturing Experience

9:20	Moderator	Dale Leavitt	WHOI Sea Grant
9:30	Sea Scallop Culture Techniques	Jay Parsons	Biol. Station, DFO. St. Andrew, N. B.

10:15 Coffee

10:30 Physical, Biological, and Tech. Considerations in siting a sea scallop aquaculture facility.
Sam Naidu DFO, St. John's, Newfoundland
11:15 User Conflicts: Some thoughts about the legal underpining of user conflicts
Peter Shelley Conservation Law Fndtn, Boston
Integrating new practices Ron Smolowitz Coonamessett Farm

12:00 Lunch

Session II: Environmental and Economic Considerations

1:00	Moderator	Ron Smolowitz	Coonamessett Farm
1:15	Environmental Issues	Don Rhoades	Woods Hole, MA
2:00	Economic Aspects	Mike Dadswell	Dept. Biol., Acadia Univ. Wolville, N. S.

2:45 Coffee

3:00 Current and Proposed Regulations in Mass. Jim Fair Div. of Marine Fisheries, Boston
3:45 A report to the New England Fishery Management Council in preparation for the development of a policy and management strategy for EE-Based aquaculture.
Bill Brennan NEFMC
3:45 Discussion of Breakgroup topics Dale Leavitt and Harlyn Halvorson

4:00 Roundtable

Moderator	Eric Nelson	NMFS Habitat Protection, Glouster
Respondents	Judy Dutra	Truro Aquaculture Project
	Carl Rask	Massachusetts Aquaculture Association
	Barbara Bragdon	F/V Resolute, Dennisport
	Jack Pearce	NMFS, Woods Hole
	Mark Simonitsch	Fish Weirs, Inc. Chatham
	Rod Taylor	Taylor Seafood, Fairhaven
	Cliff Goudey	MIT Sea Grant

6:30 Reception

7:00 Dinner

Session III: Overview

8:00	Moderator	Mark Forest	Staff to Rep. Studds
	Mass. Aquaculture Initiative	Jay Healy	Commissioner Dept. Food and Agric.
	Organizing Break out Groups	Cliff Goudey	MIT Sea Grant
		Sandy Campbell	Concensus Management, Inc.

Tuesday July 25 9:00 AM

Working Group Paper Review Dale Leavitt and Harlyn Halvorson

Session IV: Developing Sea Scallop Policy for Mass.

9:20 Breakout groups will each be assigned specific topics, a facilitator and a rappateur. The breakout groups will each meet to discuss their issue as put forth in the Working Paper and modify the appropriate sections as deemed necessary by the breakout group.

12:00 Lunch

Session V: Consensus Building

1:00	Reports of Breakout Sessions.		
2:00	General discussion		
	Moderator	Rollin Johnson	Kennedy Sch. of Gov. Harvard Univ.
4:00	Selection of a representative drafting committee		
4:30	Future Strategies	Mark Forrest	Staff to Rep. Studds, Hyannis

Sea Scallop Workshop
November 17, 1995
Cape Cod Economic Development Council
480 Barnstable Rd.
Hyannis, MA

Agenda

1.	Welcoming Remarks		Mr. John O'Brien Dr. Harlyn Halvorson
2.	Massachusetts Initiatives		Mr. Jay Healey* Ms. Susan Snow-Cotter*
3.	Cape Ann S.S. Activities		Mr. Richard Taylor
4.	Status of Ongoing Projects		Mr. Ron Smolowitz Ms. Judy Dutra* Mr. Richard Karney*
5.	Review of Recommendations	Dr. Dale Leavitt	
6.	Discussion: Developing a Strategy for Sea Scallop Aquaculture Creating & Action Group Funding		Dr. Rollin Johnson* Dr. Harlyn Halvorson
7.	Plans for the next meeting		

* invited participants

AGENDA

SEA SCALLOP WORKSHOP
9:30 AM - Noon December 15, 1995
Cape Cod Economic Development Council
480 Barnstable Road, Hyannis, MA

1. **Welcoming Remarks** — **Mr. John O'Brien**, **Dr Harlyn Halvorson**

2. **Aquaculture Boundary Jurisdiction in Massachusetts** — **Mr. Leo Byrnes**

3. **NE Fishery Management Council**
   Update
   Written Response to Amendment
   Brennan Management Strategy Report
   Dates for Aquaculture Subcommittee Meetings
   — **Mr. Ron Smolowitz**, **Dr Cliff Goudey**

4 **Falmouth Shellfish Association and Shellfish Advisory Committee** — **Dr. Dale Leavitt**

5. **Draft Letter** — **Dr Harlyn Halvorson**

6. **Future Action Items**
   Identify Suitable Sea Scallop Aquaculture Tracts
   Other
   — **Dr Dale Leavitt**, **Dr. Rollin Johnson**

7. **Next Meeting** — **Dr Harlyn Halvorson**

AGENDA

Sea Scallop Workshop
9:30 AM - Noon January 26, 1996
Cape Cod Economic Development Council
480 Barnstable Road, Hyannis, MA

1. Welcoming Remarks — Mr. John O'Brien, Dr. Harlyn Halvorson, Mr. Leo Byrnes

2. NEFMC Public Hearings on Amendment # 6 — Mr. Ron Smolowitz

3. Backers Prospective of Funding for Aquaculture — Mr. James Tiermen, Vice Pres. Fleet Bank

4. Past Experiences in Funding the Aquaculture System: Growers, Food Processors, and Distributors — Mr. Link Murray, Blue Gold Mussel, Inc.

5. State Loans to Protect Industrial Workers in Food Processing — Mr. Bud Tackett, Industrial Serv. Programs, OBD

6. Subcommittee Progress Reports — Dr. Cliff Goudey, Dr. Dale Leavitt

7. Position Statement on Aquaculture from Mass. Audubon Soc. — Dr. Harlyn O. Halvorson

8. Next Meeting

AGENDA

Sea Scallop Workshop
9:30 AM - Noon February 15, 1996
Cape Cod Economic Development Council
480 Barnstable Road, Hyannis, MA

1. Welcoming Remarks — Mr. John O'Brien, Dr. Harlyn Halvorson

2. Report of NEFMC Actions — Mr. Ron Smolowitz

3. Update on State Economic Plans to Support Aquaculture — Mr. Kent Lage

4. Subcommittee Report: Strategy for Dealing with the NE Fisheries Management Council — Dr. Cliff Goudey

5. Subcommittee Report: Recommendations on Identifying Tracts for Sea Scallop Aquaculture in Massachusetts — Dr. Dale Leavitt

6. Draft Response to Position Statement on Aquaculture from Massachusetts Audubon Soc. — Dr. Harlyn O. Halvorson, Dr. Jack Pearce

7. Next Meeting

This meeting will be followed by a meeting of the SeaStead Technical Advisory Committee (1 - 3 PM) — Dr. Dale Leavitt

AGENDA
Sea Scallop Workshop
9:30 AM - Noon
Friday May 17, 1996
Cape Cod Economic Development Coumcil
480 Barnstable Road, Hyannis, MA

1. Welcoming Remarks — Mr. John O'Brien, Dr. Harlyn Halvorson

2. Future Goals for Northeastern Regional Aquaculture Center
   Dr. Kim Harrison, NRAC

3. Predation and Bottom Ranching
   Dr. Miriam Barbeau , WHOI (invited)

4. GIS Technology for Identifying Sea Scallop Aquaculture Tracts
   Dr. Robert Edgar, UMass Dartmouth

5. National Aquaculture Development Plan of 1996
   (JSA Draft will be available at the meeting)
   Dr. Harlyn Halvorson

6. Other Business
   - History of Sea Scallop Aquaculture Project in NE
   - Bibliography Project

7. Next Meeting

AGENDA
Sea Scallop Workshop
9:30 AM - Noon
Wednesday Oct. 16, 1996
Cape Cod Economic Development Council
480 Barnstable Road, Hyannis, MA

1.	Welcoming Remarks	Mr. John O'Brien Dr. Harlyn Halvorson
2.	JSA meeting update	Dr. Harlyn Halvorson
3.	National Aquaculture Development Plan update	Dr. Harlyn Halvorson Dr. Kim Harrison
4.	Net Pen Aquaculture	Don Bishop, N. American Representative of a Japanese Fish Net Company
5.	Right Whale Considerations	John Caskey, NMFS Jim Fair Mass Div. Marine Fisheries
6.	NRAC Web site, Newsletter	Dr. Kim Harrison
7.	Other Business	Smolowitz: Status of Westport Sea Scallop Enhancement Project Status of grant applications
8.	Next meeting	

AGENDA

SEA SCALLOP WORKSHOP

9:30 AM - noon, March 5, 1997
Cape Cod Economic Development Council
480 Barnstable Road, Hyannis, MA

1. Welcoming Remarks	*Mr. John O'Brien* *Dr. Harlyn Halvorson*
2. Views from the Congressional Scene	*Mr. Mark Forest*
3. Aquaculture Opportunities at the MBL	*Dr. Rodger Hanlon*
4. WHOI Sea Grant Funding	*Dr. Dale Leavitt*
5. Northwest Atlantic Marine Alliance	*Mr. Mark Simonitsch* *Mr. Craig Whitcomb*
6. Proposal for the Boston Market	*Mr. Sandy Campbell*
7. Plans for Sea Scallop Fact Sheets	*Dr. Harlyn O. Halvorson*
8. Next meeting	

AGENDA

SEA SCALLOP WORKSHOP

9:30 AM - noon, April 30, 1997
Cape Cod Economic Development Council
480 Barnstable Road, Hyannis, MA

1. Welcoming Remarks	*Mr. John O'Brien* *Dr. Harlyn Halvorson*
2. Financial Support for Aquaculture Development Loans: Crop Disaster Relief Program	*Mr. Leo Byrnes* *Mr. Paul Russell* Farm Service Agency (USDA)
Loans Available from CDI	*Ms. Jeannine Marshall* Cape & Isl. Community Develop., Inc.
3. GIS Project Status	*Dr. Bob Edgar*
4. Lessons Learned: Westport Project	*Dr. Cliff Goudey* *Mr. Ron Smolowitz* *Dr. Dale Leavitt*
5. Update State Initiatives	Mr. Scott Soares
6. Sea Scallop TV Taping	*Dr. Harlyn Halvorson*
9. Next Meeting	

AGENDA

SEA SCALLOP WORKSHOP

9:30 AM - noon, September 9, 1997
Cape Cod Economic Development Council
480 Barnstable Road, Hyannis, MA

1. Welcoming Remarks — *Mr. John O'Brien*, *Dr. Harlyn Halvorson*

2. NMFS Survey Sea Scallops on Georges Bank — *Dr. Dale Leavitt*

3. Status Reports
   - Westport Project — *Mr. Ron Smolowitz*
   - Gloucester Sea Scallop Project — *Mr. Richard Taylor*

4. Joint NEFMC/Federal Agency
   - Aquaculture Administration Process — *Mr. William Brennan*

5. Update State Initiatives — *Mr. Scott Soares*

   a. Sea Scallop Commercialization
      Hatchery Contract Harborlife — *Mr. Rob Garrison*
   b. Draft Mass. Aquaculture Grant Program
   c. Shellfish Propagation Program
      Martha's Vineyard & Nantucket

6. Coarse Outreach for Regulators: Status — *Dr. Dale Leavitt*

7. Coming Meetings
   - World Aq. Society last of Jan. or Feb. in Los Vegas
   - State Aquaculture Subcommittee Meetings

9. Next Meeting

AGENDA

SEA SCALLOP WORKSHOP

9:30 AM - noon, October 30, 1997
Cape Cod Economic Development Council
480 Barnstable Road, Hyannis, MA

1. Welcoming Remarks — *Mr. John O'Brien*, *Dr. Harlyn Halvorson*

2. Status Reports
   North Truro Sea Scallop Project — *Ms. Judy Dutra*

3. Biological interactions controlling community structure; or why sand dollars don't always live with scallops — *Dr. Jack Pearce*

4. Update State Initiatives — *Mr. Scott Soares*

5. Developing an Ammendment to the NEFMC Scallop Plan — *Mr. Ron Smolowitz*

6. Coming Meetings
   NE Board of Higher Education Conference WHOI Nov. 13
   Aquaculture, Marine Sciences and Oceanography: Exploring the New England Confluence

7. Next Meeting

AGENDA

SEA SCALLOP WORKSHOP

9:30 AM - noon, January 8, 1998
Cape Cod Economic Development Council
480 Barnstable Road, Hyannis, MA

Massachusetts Aquaculture and Economic Development

1. Welcoming Remarks	*Mr. John O'Brien* *Dr. Harlyn Halvorson*
2. Regional Strategies	*Mr. John O'Brien* Director CCEDC
3. Selected Public Policy Issues	*Mr. Fernando Quezada* Exec. Director Biotech. Cntr. Exc. Corp.
4. Legislative Approaches Roundtable	
Congressman Delahunt's Staff	*Mr. Mark Forest*
Congressman Frank's Staff	*Ms. Esie Suza**
Senator Rauchenbach's Staff	*Mr. David Gillis*
Representative Peterson Staff	TBA*
Senator Bruce Tarr's Staff	*Mr. Dave Abdoo**
5. Informed Legislature: Coping with Science in a Democracy	*Ms. Megan Jones* Associate, Kennedy Sch. Gov., Harvard
6. Mass. State Initiatives	*Mr. Scott Soares* Mass. Aq. Coordinator, Dept. F&A
7. Coming Meetings	
8. Next Meeting	

* Invited

AGENDA

SEA SCALLOP WORKSHOP

9:30 AM - noon, March 3, 1998
Cape Cod Economic Development Council
480 Barnstable Road, Hyannis, MA

1. Welcoming Remarks — *Mr. John O'Brien*, *Dr. Harlyn Halvorson*
2. Area Management Options for Sea Scallops — *Dr. Steve Edwards*, NMFS Woods Hole
3. Coastal Zone Policy Considerations — *Mr. Jack Wiggin*, Urban Harbors Institute UMassBoston
4. Request to NEFMC to Extend Lease for Seastead Site — *Mr. Ron Smolowitz*, Coonamessett Farms
5. Report on Sea Scallop Aquaculture Workshop at WAS Meetings — *Dr. Dale Leavitt*, WHOI Sea Grant
6. Mass. State Aq. Update — *Mr. Scott Soares*, Mass. Aq. Coordinator, Dept. F&A
7. Coming Meetings
8. Next Meeting

BLUEPRINT FOR

SEA SCALLOP AQUACULTURE IN MASSACHUSETTS

Position Paper

Based on deliberations of a Sea Scallop Working Group

and on the Proceedings of a Workshop held at the

Cape Cod Community College, West Barnstable , MA

on July 24 - 25, 1995

Compiled by

Policy Center for Marine
Biosciences and Technology
at the
University of Massachusetts
Dartmouth

Harlyn O. Halvorson
Director

Alex Keynan
Sir Hans Kornberg
PCMBT Scholars

Sea Scallop Working Group

Ms. Barbara Bragdon, Dennisport, scalloper

Dr. Priscilla M. Brooks, Conservation Law Foundation

Ms. Judy Dutra, N. Truro, scalloper

Mr. Mark Forest, Rep. Studds Office

Dr. Cliff Goudey, MIT Sea Grant

Dr. Harlyn Halvorson, PCMBT.at U Mass Dartmouth

Commissioner Jay Healey, Dept. Food and Agriculture

Mr. J. Michael Hickey, Division of Marine Fisheries

Dr. Rollin Johnson, Kennedy School. of Government

Mr. Grant Kelley, US Army Corps of Engineers

Dr. Dale Leavitt, WHOI Sea Grant

Mr. Eric Nelson, NMFS Habitat Protection

Mr. John O'Brien, Cape Cod Economic Development Council

Mr. Karl Rask; The Cape Cod Resource

Mr. Peter ShelleyConservation Law Foundation

Mr. Mark Simonitsch, Nantucket Sound Fish Weirs

Mr. Ronald Smolowitz, Coonamessett Farm

Mr. Rod Taylor, Fairhaven, fisherman

Sponsored by:

Biotechnology Center of Excellence Corporation

Cape Cod Economic Development Council

NOAA National Sea Grant College Program Office, Department of Commerce
MIT Sea Grant Program
Woods Hole Oceanographic Institution Grant No. NA46RG0470
Project No. R / A -30 -PD

Policy Center for Marine Biosciences Technology

Rosenstiel Foundation

Printed by the
Commonwealth Electric
Company

Contents

Background

The *Policy Center for Marine Bioscience and Technology* (PCMBT), a 'center without walls', was established in 1992 to address a broad range of problems and opportunities in marine biosciences. One goal of the PCMBT is to stimulate developments in aquaculture for the economic and social benefits of the United States. The center hosted a conference - *Aquaculture and the Marine Environment: The Shaping of Public Policy*- in 1993. This conference [1], emphasized that aquaculture, the farming of aquatic animals and plants, will be a major global growth industry in the 21st Century. It is estimated that, by the year 2025, aquaculture will have to produce a total of 77 million metric tons of fish and shellfish annually - more than seven times the current total landings from wild capture fisheries and aquaculture combined. This is based on population projections and an expected concomitant 70% increase in world seafood demand in the next 35 years. A national commitment to aquaculture development must be made for the United States to be internationally competitive in this emerging growth industry.

After its 1993 conference, members of the PCMBT Steering Committee deliberated aquaculture issues early in 1994 and determined that the PCMBT could best assist the industry by focusing efforts on a single, promising species and one suitable coastal state where aquaculture could prosper. Given that situation, the committee decided to develop an action plan. The committee also recognized that, for a successful plan and industry, it would be essential to involve all relevant constituencies in the process and to utilize key resources. The selection was **Sea Scallop Aquaculture in Massachusetts.** Numerous other appropriate organizations were contacted, and representatives of these were invited to an initial workshop, which was held on December 5, 1994:

Aquaculture Entrepreneurs
Cape Cod and Islands Farm Bureau
Coastal Zone Management
Mass. Aquaculture Association
Mass. Dept. of Food and Agriculture
NRAC - USDA
Representative Gerry Studds
WHOI Sea Grant Program
Biotechnology Center of Excellence Corporation
Cape Cod Economic Development Council
Conservation Law Foundation
Mass. Division of Marine Fisheries
NMFS- Habitat and Protected Resources Division
Policy Center for Marine Biosciences technology
MIT Sea Grant Program
U.S. Army Corps of Engineers

Critical issues were identified at this meeting and a Sea Scallop Working Group was organized which held a series of meetings in 1995 to explore further critical issues, to define possible options for action and to plan a consensus format workshop. The members of the Working Group are listed on the reverse of the cover; the participants of the Workshop are listed in Appendix A.

Sea Scallop Workshop

The PCMBT and the WHOI and MIT Sea Grant offices organized a workshop for **July 24 - 25, 1995** at the **Cape Cod Community College**, with the aim of developing an action plan for sea scallop aquaculture in Massachusetts. This workshop involved many relevant constituencies and utilized key resources to develop an overall action plan. In planning for this workshop, representatives of many organizations [2] have, over this past year, held a series of meetings to identify the opportunities for, and the current barriers against, sea scallop aquaculture and to explore possible options for future progress. A Working Paper, which included a review of relevant literature [3 - 16] was prepared and served as a basis for discussion of breakout groups at the Sea Scallop Workshop. The principal issues addressed were:

1. Sea scallop culture technologies appropriate for Massachusetts;
2. Siting criteria, including consideration of user conflicts;
3. Potential environmental impacts of sea scallop aquaculture.
4. Regulatory restraints to sea scallop aquaculture;
5. Economic feasibility of sea scallop aquaculture;
6. Public education with respect to sea scallop aquaculture;
7. A better "knowledge base" on sea scallop biology and aquaculture technologies.

The workshop included presentations by invited local and Canadian experts on sea scallop biology and culture techniques, environmental requirements and issues, and economic considerations. The main speakers and topics are listed in Appendix B.

This Position Paper summarizes the main considerations advanced in the course of the workshop, both in groups and informal discussions, and records the chief recommendations that emerged from this meeting.

Needs and Opportunities

At present, Massachusetts plays virtually no part in the global development of aquaculture. As stated in the Massachusetts Marine Aquaculture White Paper [3]:

"In Massachusetts, marine aquaculture is presently limited to the cultivation of shellfish for commercial, research, and propagation purposes. There are no coastal fish farms or ocean ranches in the state and only very limited work, primarily for research purposes, is dedicated to seaweed culture."

Aquaculture has a strong growth potential; in the 1980's it was the fastest growing component of U.S. agriculture. By 1990, both production and value increased four-fold to 860 million pounds, worth $760 million. The industry now accounts for nearly 300,000 jobs and has an economic impact of several billion dollars. Yet, despite recent growth, aquaculture supplies only 10-15% of US seafood needs; the value of US aquaculture production ranked only tenth in the world in 1990. As a major seafood market, and with its substantial scientific and technical resources, the Commonwealth of Massachusetts has a major opportunity to develop a highly competitive, technologically advanced aquatic farming industry to serve national needs and to supply the global marketplace with exports of high quality products, goods, and services.

From an economic viewpoint, the sea scallop, *Placopecten magellanicus* (also called the giant scallop, the smooth scallop, the ocean scallop, or the Atlantic deep sea scallop [4]); is by far the most important commercial pectinid species in the world. *Placopecten* comprises more than half of total global scallop landings from wild capture fisheries. Moreover, cultured scallops have now overtaken the wild catch in terms of total landings. For example, in 1993 *Placopecten yessoensis* culture production in China was 200,000 MT and in Japan, 300,000 MT.

Sea scallop culture is one of the most appropriate ways to further develop the aquaculture industry in Massachusetts. Some of the advantages of scallop aquaculture are:

1.)The Giant Scallop, *Plactopecten magellanicus,* is indigenous and abundant in coastal waters off Massachusetts,
2) Scallops can be grown without adding food to the sea water thereby avoiding feed costs and concern over water quality,
3) Sea scallop culture systems can be located offshore - avoiding concerns of home owners in the coastal zone; however, much of the most productive waters will be found in the inshore areas, estuaries and embayments,
4) Massachusetts has a well-established marketing system and considerable experience in harvesting, processing, shipping and exporting of scallops.

The scallop fishery is one of the many commercial fisheries in New England that is being overexploited. In reaction to the dramatic decrease in the George's Bank scallop population, the New England Fisheries Management Council (NEFMC) Scallop Committee drastically restricted the scallop fleet, which includes over 400 boats fishing from the premier New England scallop fishing ports of Gloucester and New Bedford. Because of continued decline of harvestable scallop stocks, the NEFMC Scallop Committee, in 1995, shut down scallop fishing in selected areas of George's Bank, and is currently debating the effectiveness of these, more restrictive, management practices [5]. The demise of the wild caught fishery and the increased severity of the recently enacted fishing restrictions has brought hard times to the New England fishing fleet and have forced commercial scallopers to consider alternative means to support their industry.

The sea scallop industry can be assisted in several ways. One means is to artificially increase standing stocks of the species by way of a seeding / restocking program. A better way is to develop aquaculture of the deep sea scallop using the existing fishing infrastructure. Scallop aquaculture can reduce fishing pressure on wild stocks, and as an added incentive would employ many individuals, particularly experienced scallopers and fishers as scallop farming requires extensive maritime skills.

1. Regulatory constraints to sea scallop aquaculture

Regulatory reform is clearly needed if sea scallop aquaculture is to be promoted. Many recent studies of the aquaculture industry in the US. have concluded that regulations are one of the major disincentives to aquaculture development in the marine environment [6]. A number of reforms have been identified by a task force established by William Weld, Governor of Massachusetts, to examine these issues. The following regulatory issues and recommendations are specifically oriented to sea scallop culture.

Jurisdictions

Regulations within three jurisdictional categories affect sea scallop aquaculture: town, state and federal. The following brief summary presents what we perceive to be the major regulatory problems impacting sea scallop aquaculture within each jurisdiction.

State territorial waters extend for 3 statutory miles from a baseline defined at the average low water mark, or from the mouths of bays or lines between islands. Towns have jurisdictions seaward for three miles for all shellfish aquaculture. For adjacent towns the boundaries of authority may be confusing. The State should produce a map indicating town and/or municipality boundaries. Permitting requirements within town jurisdiction are also dictated or governed by State and federal government. Each town has its own system / operational procedures regarding shellfish aquaculture. Very few towns, if any, have shellfish departments that have the informational resources or knowledge base to make informed regulatory decisions or to oversee sea scallop aquaculture projects. Their expertise is generally limited to the cultivation of clams and oysters within intertidal and shallow subtidal areas.

Local jurisdiction is derived from home rule authority granted by the State. With respect to Aquaculture important local jurisdiction derived from the State include authority for:

- Aquaculture license (Ch. 130, sec. 57)
- Wetlands Protection Act (Ch. 131, sec. 40)
- Chapter 91 licenses

Unless the grant of home rule authority specifies otherwise, it would appear that local jurisdiction would extend to those State waters which are contiguous to the municipality. (In the case of Chapter 91, the home rule delegation appears to be limited to certain activities and areas managed by the harbor master).

If local jurisdiction extends to all adjacent State waters it could appear in some instances to extend beyond three miles. For instance, it would appear to extend into embayments such as Cape Cod Bay, which are within State waters as recognized by the Submerged Land Act of 1995.

In several key geographic areas where state jurisdiction extends beyond town waters, sea scallop aquaculture may be particularly well-suited. These areas include the North Shore waters, Massachusetts Bay, Cape Cod Bay, and Nantucket Sound. However, a major problem is that the Commonwealth has no current procedures / laws for providing exclusive use to any potential sea scallop project in these areas under its jurisdiction.

The area from 3 to 12 miles is considered **federal territorial waters.** In this zone the federal government acts as trustee of the environment and assumes responsibility for the laws affecting water quality, the protection of endangered species, navigation and the fishing of wild stocks.

The federal government has primary jurisdiction in the **Exclusive Economic Zone** (EEZ) which extends from 12 to 200 miles, where permitting may require several agencies, particularly the U.S. Army Corps of Engineers, depending on the site's location. The U.S. Army Corps of Engineers, under the Rivers and Harbor Act of 1899, has regulatory authority for any structures placed in navigable waters of

the U.S., including the EEZ. A permit from the Stellwagen Bank National Marine Sanctuary office is required for culture activities proposed within the boundaries of the Sanctuary. The National Marine Fisheries Service (NMFS), acting under the Magnuson Fishery Conservation and Management Act of 1976 (Magnson Act) and in conjunction with the New England Fishery Management Council (NEFMC), has the authority to regulate scallop aquaculture activities in the EEZ, but has not as yet set up the framework to do so in an expeditious manner. Currently, if a scallop aquaculture activity requires exclusive use of the sea bottom, changes to one or more of the fishery management plans may be required. This has proven to be a long and unpredictable process.

Although there are some unresolved questions, State and local jurisdiction is generally limited to the State territorial waters, while Federal dominion and emporium is paramount in the Federal territorial waters and the Exclusive Economic Zone

A comprehensive compilation of legal requirements is needed which apply to aquaculture in coastal waters that will build upon a recent NRAC document on government regulation of growth and development [7]. There is serious need for a guidance document in this area for the following reasons:

- In order to obtain financing, it will be necessary to assure financial institutions that all necessary permits have been obatianed, and legal requirements met.
- Developers of aquaculture need protection from suits which might be brought from any party who objects to the project.

Geographical areas

Several major geographical areas along the Massachusetts coast and the major regulatory problems associated with each of these areas regarding sea scallop aquaculture are as follows:

- North Shore

The nearshore waters surrounding Cape Ann are well suited for scallop aquaculture. Appropriate environmental conditions in near shore waters could avoid the logistical problems of culturing in the offshore environment.

- Buzzards Bay

Summer water temperatures in Buzzards Bay might be too high for sea scallops [8], although incidental information is available that sea scallops can be found in these waters, they are not commercially harvested due to fishing restrictions in Buzzards Bay at which time regulatory issues could arise. However, at some future time Buzzards Bat might be used as refuge during the winter for mobile sea scallop systems.

- Cape Cod Bay

Cape Cod Bay has many potential sea scallop culture sites under state jurisdiction and a few under town domain. However, most of Cape Cod Bay has been defined as a critical habitat for the Northern Right Whale. This designation may severely limit the development of sea scallop aquaculture in the bay. The issues are whale entanglement in aquaculture gear and interference of gear with whale movements. The Corps of Engineers (COE), in conjunction with the National Marine Fisheries Service (NMFS), should identify currently acceptable and unacceptable sea scallop culture designs for use in Cape Cod Bay.

- Nantucket Sound, Vineyard Sound and Massachusetts Bay

These water bodies have both town and state regulations. For some regulatory issues which may impact sea scallop aquaculture within Nantucket Sound, it is unclear whether jurisdiction resides with the State or federal government. In particular, there are EEZ and federal waters in the Nantucket and Vineyard Sounds for which the Commonwealth has fisheries management responsibilities. Navigational issues, both commercial and recreational transit, might be a limiting factor in these bodies of water.

- Outer Shores

This category includes all the open ocean areas east and south of Massachusetts. Beyond three miles the jurisdiction over aquaculture falls to the federal government with the associated problem described previously. The four main regulatory issues that will affect sea scallop aquaculture in these

areas, once the permitting procedures are reformed and established, are user conflicts, mooring design / certification, navigation and protection of endangered species.

Recommendations:

- **Charge some individual or entity within the Commonwealth government to act as an advocate for sea scallop aquaculture in dealing with the federal process.**

- **Each jurisdiction should be urged to identify aquaculture tracts suitable for sea scallop culture and establish procedures / criteria for issuing sea scallop leases within these tracts. The New England Fisheries Management Council should do this for their jurisdiction by developing an Aquaculture Fisheries Management Plan (FMP).**

- **Request the U.S. Army Corps of Engineers (COE), in conjuction with NMFS, identify the size and scope of the operations that they will allow within Cape Cod Bay and identify the tracts of least potential cumulative impact on right whale critical habitat.**

  Provide State funds to the Massachusetts Division of Marine Fisheries and / or the Sea Scallop Working Group to gather and analyze existing and new data to assist in the identification of potential sea scallop aquaculture tracts with federal, state and town jurisdiction.

- **Request the Corps of Engineers to promote research on mooring design criteria and issue regulatory guidelines.**

- **Request the Commonwealth to clarify its authority over aquaculture in Nantucket Sound.**

- **Provide adequate funding for legal resources to: clarify the geographic jurisdictions in which local, state. and Federal requirements apply; describe what these legal requirements are; provide guidance on how to meet these requirements; and undertake measures to simplify these requirements; consolidate overlapping review procedures; and revise these requirements, if necessary, without jeopardizing other public concerns, particularly those regarding the environment**

2. Site selection for sea scallop aquaculture

Site selection for sea scallop culture should include an assessment of an area's biological and physical parameters in order to best determine its suitability for sea scallop growth and survival, and the technology and effort required to grow scallops economically at that site [9]. In addition, other uses of the area need to be identified (e.g., commercial or recreational fishing, vessel traffic, whale breeding and feeding) in order to anticipate or avoid user conflicts, which could possibly result in the delay or denial of necessary permits.

The biological requirements for sea scallop aquaculture have been established based on data from several countries. The chief requirements are: ambient temperatures between 10^{o} and $18^{o}C$, salinity approximating "normal" sea water levels, an adequate supply of plankton, absence of pollutants, and a constant and sufficient supply of oxygen. Gravel is preferred to mud for bottom culture.

Those physical parameters which should be considered in site selection include proximity of the site to a home port, average wind and wave energy, exposure to storm events, water depths, currents, and substrate type. Massachusetts' waters are largely exposed to considerable wind and wave energy, but sea scallop culture under these conditions is still feasible if the appropriate water depths exist and the appropriate culture techniques are applied. Commercial and recreational fishing (and boating in general)

is common in Massachusetts coastal waters. Given the active and varied use of our waters, successful sea scallop culture will require a harmonious existence with other activities. A thorough site assessment should help to avoid some obvious conflicts, and the option of utilizing culture techniques (e.g. bottom culture) that permit the multiple use of an area, should help to prevent other conflicts.

Upstream, the chief environmental concern is water-borne contaminants which may affect scallop nurseries and culture sites. Contaminants include chemicals such as polynuclear aromatic hydrocarbons (PAHs) or polychlorinated biphenyls (PCBs) and/or biological agents such as coliform bacteria or other indicators of the presence of sewage in the water, and the biological toxins such as those causing paralytic shellfish poisoning (PSP) in clams. Monitoring for many of these upstream contaminants is routinely done within State waters which are required to be State certified before shellfish culture can be initiated. Unfortunately, the routine monitoring of water quality by the State stops at the boundaries of the State waters and little to no provisions are made for assessment and certification of water quality of federal waters (in the EEZ) with respect to certification of water quality.

One of the most important things that should be done immediately is to describe the physical and biological attributes of the Massachusetts coastal region, and after bringing these various existing data and information together, relate them to the habitat needs of the scallops. Moreover, these data have been collected and recorded in non standardized ways and formats and are divided between several private, State and Federal agencies. To achieve progress on sea scallop aquaculture in Massachusetts, coastal areas need to be classified using standard methods and that information presented using a standard format (such as provided by the Geographic Information System "GIS"), and coastal areas for which data is lacking need to be identified and the data collected. In addition, this consolidation and augmentation of information would reveal locations where there are conflicting interests between existing uses of the maritime environment and possible developments of sea scallop aquaculture. These conflicts could then be rationally examined and, it is hoped, resolved. It would further be essential to devise means whereby such information can be made available to potential experimental and commercial aquaculturists. The best way to achieve all these objectives would be to set up a central depository of such data, under the aegis of a State agency (DMF, CZM).

Recommendations:

- **Classify suitability of coastal areas for aquaculture, by using standard methods (such as those provided by the Geographic Information System "GIS").**
- **Set up a central data depository for informing potential commercial and experimental aquaculturists, under the aegis of a State agency (DMF, CZM).**

3. Culture techniques for sea scallop aquaculture

Two grow-out methods are routinely used world-wide to culture the sea scallop. The first is bottom culture, either by ranching, where the scallops are freely dispersed on the bottom, or by containment in bottom cages. The second method is suspended culture, either in a contained system (in pearl or lantern nets or suspended cages) or as individually tethered scallops (by ear hanging or individual pockets) [9].

Economically feasible techniques for the aquaculture of sea scallops have been developed in many parts of the world, notably Chile, China, Japan and Canada. The species preferred (Placopecten magellanicus), and the geographical constraints outlined under section 2 above, make the Canadian experience the most relevant for sea scallop aquaculture in Massachusetts waters. However, it appears there is no suitable gear for off-shore, deep water scallop culture, as envisaged for Massachusetts. The development of such apparatus is obviously of the highest urgency. Although relevant work is already underway at MIT; much greater effort, preferably under the aegis of this or other academic institutions and preferably funded jointly by State, federal and private (industry) money, will be needed for aquaculture of sea scallops to flourish in New England. In designing apparatus which optimizes scallop growth, due attention must be paid not only to robust construction and secure mooring but also to protecting the scallops against possible intrusions by predators, such as sea stars, crabs, lobsters, dogfish, cod and

wolfish, and to protecting the environment against possible impacts to endangered species and to environmentally sensitive sites.

Bottom ranching entails the release of juvenile scallops within a designated area. The scallops are allowed to remain on the bottom undisturbed until the majority of the deployed scallops reaches a predetermined size threshold at which the scallops are then harvested for market using conventional harvesting technology. Sea scallops are mobile swimming shellfish and actively move about the ocean bottom [11].

Although bottom ranching has been shown to result in reductions in scallop growth rates when compared to off-bottom culture techniques, it has been suggested to be more economically desirable for sea scallop culture in Atlantic Canada [12,13]. This is due primarily to the reduced level of equipment and time invested in maintaining the culture system. Hatcher *et al.* [13] observed a range of scallop returns, from <1 to 48%, during harvest of scallops deployed in three differing bottom conditions. Losses were attributed primarily to predation by crabs and starfish.

Bottom cage culture may be appropriate technology for scallop farming in Massachusetts waters;. the cost benefits need to be calculated. Bottom containment counteracts potential scallop losses due to migration and / or predation, without suspension of structures in the water column.

The deep sea scallop grows at a faster rate in suspended culture than in bottom culture [8]. Therefore suspended culture of the sea scallop also is a viable means of juvenile growout. In addition, *P. magellanicus* growth rates in suspension culture are maximal at shallow depths (9 m) and decrease with increasing depth (to 21 m) in the Gulf of St. Lawrence [14]. This corresponds to similar observations on growth rates of shallow versus deep water wild scallops [8]. The interplay of depth and water temperature may become a key consideration in prescribing appropriate culture techniques for sea scallop aquaculture in Massachusetts.

Recommendations:

- **Promote the development of gear suitable for off-shore sea scallop aquaculture in Massachusetts waters.**

- **Support a grow-out demonstration project to compare culture techniques.**

4. Supply of seed ('spat') for sea scallop aquaculture

Aquaculture of sea scallops in Chile and Japan is based on the production of juveniles (spat) in hatcheries; Canadians rely mainly on the collection of spat from well-defined sites that have been established over a number of years [15]. Cultivation of sea scallops in Massachusetts might well benefit from both approaches. Reliance on the collection of wild spat would require sites that reproducibly and reliably yield adequate supply to stock commercial sites; suitable collection sites in Massachusetts waters have yet to be identified.

Hatcheries would provide a controllable environment for developing fertilized eggs to the larval stage. Although sea scallop hatcheries are currently subject to unexplained and unpredicted losses of animals, research should solve these difficulties for sea scallops and other species. Hatcheries could also provide back-up against natural disasters which could damage or destroy suitable wild spat collection sites.

The success of sea scallop aquaculture in Massachusetts will depend on reliable and constant availability of seed, which in turn will require the development of appropriate hatcheries, and research to identify sites and time slots to optimize collection of spat. This research and development work would best be undertaken by academic institutions and will inevitably require funding from the public purse.

Techniques for rearing spat and enhancing juvenile growth must be identified; these may include temperature manipulations, optimization of food resources, and genetic selection for faster growing individuals.

Recommendations:

- **Support the development of sea scallop hatcheries in New England.**
- **Promote research to identify optimal sites and time slots to maximize spat collection.**

5. Potential environmental impacts on and by aquaculture of sea scallops

One of the main advantages of culturing sea scallops, which obtain their food from the water column, is that the technology does not present a significant impact on the environment, although it is possible that environmental issues may be raised regarding specific sites.

Downstream, from the sea scallop culture system there may be an impact on the marine environment, however shellfish aquaculture is generally considered to have little to no impact on water quality or benthic conditions. Scallop culture does not require inputs of biological or chemical nutrients and treatments. Therefore, oxygen depletion, carbon loading, and negative impacts on biological diversity are not problems of scallop culture systems. Concern has been expressed regarding the buildup of shell debris downstream from some mussel culture facilities, but there has been little research to quantify the environmental impact of shell accumulation or whether there would be a similar issue for scallop culture. In the long run, the main environmental issue may be handling of the waste products accumulated during the processing, rather than the culture, of sea scallops. In this industry, as with other aquaculture ventures, utilization of waste products has been actively pursued for both economic and environmental benefits.

Inshore and offshore programs are recommended to monitor environmental impacts on and by scallop farms. While few inshore areas are likely suitable for sea scallop aquaculture, except in the vicinity of the North Shore and possibly Cape Cod Bay, monitoring for levels of coliform bacteria and algal toxins is necessary. Offshore areas may not require extensive testing, but would need monitoring for algal toxins. The most efficient way to conduct this monitoring is still open to discussion. For offshore waters, an area monitoring program would be more efficient than monitoring individual sites.

An on-site environmental issue is the potential for entanglement of whales and sea turtles in the dense array of lines and gear at suspension culture sites. The risks are greater in areas where whales and turtles concentrate to feed and raise young. Cape Cod Bay is such an area; it has been designated a critical habitat for the northern right whale, the most endangered whale species in New England. In order to utilize such areas for scallop culture, techniques (i.e. bottom culture) should be developed that minimize the potential for entanglement.

An additional environmental issue is the potential for exacerbating an indigenous disease condition through the concentration of sea scallops within a vary small area. Little is known about diseases of the sea scallop; with the exception of toxin ingestion by whole animals, disease problems have not been reported. However, the possibility should be borne in mind that diseases may follow on the development of intensive culture systems: past experience with other domestication systems, albeit with organisms cultivated at densities much greater than those used for sea scallop aquaculture, strongly suggest that disease development may become an important determinant of success.

Recommendations:

- **Establish a water quality and shellfish monitoring program at designated aquaculture sites or regions.**
- **Encourage an organization knowledgeable about diseases of marine organisms, such as the Laboratory for Marine Animal Health at MBL in Woods Hole, to develop a sea scallop disease / health monitoring program.**

6. Economic feasibility of sea scallop aquaculture

> *" A primary impediment to aquaculture today is financing. There is a misconception about the nature of the business and very little information usable for investment analysis"* (Tom Hopkins, Maryland Aquaculture Association).

The economic feasibility of sea scallop aquaculture has been well established in several countries with different economic climates. Countries as diverse as Chile, Japan, China, Canada and Great Britain have established or are establishing economically viable scallop aquaculture industries. Massachusetts waters have the potential for supporting successful scallop aquaculture; to determine the economic feasibility of a scallop aquaculture industry in Massachusetts, an estimate of the total annual production (tons) from Massachusetts waters is needed.

Research and industry infrastructures already exist in Massachusetts which would support an aquaculture industry. Several Massachusetts institutes (MBL, WHOI MIT, Univ. Mass., and others) have scientists with aquaculture expertise and experience and laboratories suitable for conducting aquaculture research. The processing and marketing infrastructure of the Massachusetts scallop fishery can be used and developed for farmed scallops.

The sea scallop aquaculture industry has the potential to create employment for a ready and skilled labor force , i.e. fishermen (especially scallopers). Opportunities include scallop farm operators/owners and employment on scallop operations.

Marketing analysis is required to determine national and international marketing potential of sea scallop aquaculture in Massachusetts and the possible economic impact (total annual revenues and jobs) of a scallop aquaculture industry in Massachusetts.

There is abundant evidence that the development of viable aquaculture industries depends on the availability of direct State-funded support. In 1993, the five leading aquaculture producing states provided financial support to the industry [5]. Hawaii and California, with rapidly growing industries, have established loans or other financial assistance programs for aquaculture producers. A Massachusetts aquaculture industry could benefit from similar programs and support.

A State Aquaculture Plan should be developed in collaboration with industry and researchers. A consensus process should be used to encourage input from all sectors and constituencies, and to include in the plan, all potential aquaculture species in Massachusetts. The sea scallop position paper could serve as a model.

A State Aquaculture Coordinator is needed to coordinate policy in all of the State agencies which govern or administer to the aquaculture industry, as well as to work with federal agencies and municipalities. Additional responsibilities would be to provide information; to encourage venture capital to remain in the State, and to work with the financial community to encourage the financing of sea scallop aquaculture ventures.

A State Aquaculture Extension Service is needed to implement this State Aquaculture Plan.

Industry Support Funds will be required to support various programs to assist development of the Massachusetts aquaculture industry. Sea scallop aquaculture ventures will require start-up funds, such as those previously available under the Small Business Assistance Programs. The availability of funds for aquaculture does not mean that people are going to rush to get a loan in aquaculture. To obtain private capital, the right market must be created, much of which has to do with addressing the regulatory issues discussed earlier. The State also has a role to play, in the areas of education, extension, loans and insurance for demonstration projects. Insurance already exists for fish farms and this should be available also for shellfish. We recommend that the State establish a revolving loan fund to assist operators in increasing their production to a commercial level. With all aquaculture projects, it takes about three years to develop a site before it is feasible to scale up to an commercial level. Here demonstration projects are very valuable as not only do they provide guidance for evaluating sites for sea scallop aquaculture but they

reduce that three to five-year learning period. Therefore we recommend some support for demonstration projects.

Some of the fishermen could take the initiative to create scallop aquaculture, others could be employed by the existing industry. Incentives could be start-up loans for those who wish to start industries, as well as some incentives for existing industries which wish to employ fishermen.

While this Position Paper is strictly for Massachusetts, we recognize that fishermen from different states and localities fish in these waters. To gain their cooperation we need to also talk about Long Island Sound, Block Island Sound, and the Massachusetts areas, states and providence's to the North.

In Summary, the Commonwealth of Massachusetts has several regions potentially suitable for successful sea scallop farming. and has research, processing, and marketing infrastructures already in place, as well as a labor force skilled in maritime activities and scallop handling. What is needed is direct, state-funding to conduct an economic feasibility study, to develop a State Aquaculture Plan, and to establish and maintain a state infrastructure to assist the industry, including support for Aquaculture Coordinator, an Aquaculture Extension Service, and Industry Support Programs.

Recommendations:

- **Conduct an economic feasibility study of sea scallop aquaculture in Massachusetts.**
- **Provide for a model within the sea scallop aquaculture plan for other aquaculture fisheries within the State through the development of a State Aquaculture consensus plan.**
- **Provide support for demonstration projects.**
- **Appoint a State Aquaculture Coordinator to coordinate State efforts in regulating aquaculture and / or to work with the sea scallop industry. This office would provide information, encourage venture capital to stay in the State, and work with the financial community to encourage the financing of sea scallop aquaculture projects.**
- **Develop an extension service for aquaculture in the State (e.g., MA Department of Food and Agriculture), and support the expansion of Sea Grant or CES.**
- **Provide affordable insurance.**
- **Fund Small Business Assistance Programs to encourage sea scallop industry growth through the Executive Office of Economic Affairs.**
- **Establish a revolving loan fund for sea scallop aquaculture start-up capital for projects using proven methods.**

7. Provision of information regarding sea scallop aquaculture

For aquaculture to flourish in the Commonwealth, there is a need to gather and distribute information about the industry. Consultations on a valuable but limited scale are already provided by the Sea Grant Program, by the USDA Northeastern Regional Aquaculture Center, and Barnstable County Cooperative Extension, but a greater effort will be needed for an expanded aquaculture industry. An efficient way to do this and also to provide for technology transfer is through an extension service, such as has been successfully demonstrated for agriculture. Formal education programs that cut across disciplines are needed: these could most effectively be offered in universities, community colleges, vocational agricultural institutions, and research institutions. Target audiences would include operators, interested individuals in the public-at-large, town regulators, and representatives of financial and

insurance interests. Currently there is a lack of printed material on sea scallop aquaculture. Since many business failures in the past can be attributed to inadequately prepared operations, this educational effort should provide a more stable environment for this industry in Massachusetts.

Much time and effort could also be saved by providing information to potential aquaculturists, benefiting from the experience of sea scallop cultivation in Canada and some states of the USA, such as Louisiana. The relevant official agencies in the Commonwealth are best placed to achieve this result, by consulting with sister bodies in these and other locations.

Recommendations:

- **Promote courses in aquaculture at institutions of higher education.**
- **Encourage State agencies to gather information on scallop culture activities from other states and other countries.**
- **Encourage companies conducting aquaculture research, development and marketing to collaborate in order to establish an aquaculture cooperative and to obtain capital from State and private sources.**

8. Basic research to support a sea scallop aquaculture industry

Although considerable progress has been made in the culture of the sea scallop, much remains to be done [16]. It is likely that the momentum *already in place* will culminate in the establishment of a significant growth industry along the Atlantic coast [4]. As identified above, basic and applied research directed to the development of sea scallop aquaculture requires an increased effort to address the shortcomings in our knowledge base.

Scallop aquaculture research efforts in other regions of the world, working with different scallop species and including Japan, China, Chile, and Europe, have resulted in the development of commercial scallop aquaculture industries in each of these geographic areas. The Canadian effort has made significant advancements to the field of sea scallop aquaculture, funded in large part by federal sources. The U.S., and the Commonwealth of Massachusetts specifically, must increase the level of funding to meet this need. The scientific expertise is available, particularly in Massachusetts, and the research efforts are being proposed. The money to undertake this research effort must be forthcoming.

Basic research is needed in biology, ecology and technology to acquire reliable information on,:

- the factors essential for the collection of wild seed ('spat') or for the production of seed in hatcheries;
- the sites in Massachusetts at which such seed can grow to marketable size in the minimum of time;
- what apparatus is best fitted for the cultivation of sea scallops and their harvest in MA, and how such apparatus can optimally be developed.

Research and development should be done in close cooperation with the industry to assure that the research effort is productively focused. Applied scientific research must be driven by the industry to ensure the issues studied are the most pressing deterrents to the development of the industry. The State of Maine has successfully addressed the issue by establishing in 1989 three Maine Aquaculture Innovation Centers (MAIC). The MAIC's are state assisted, but industry drives research and development centers. As such they are very responsive to industry needs while maintaining a balanced representation from government and industry [5].

Recommendations:

- **Establish stable long term funding for a Massachusetts Aquaculture Innovation Center, modeled after the Maine Aquaculture Innovation Center.**

- **Increase State and Federal funding in support of developing sea scallop aquaculture technology.**

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Appendix A

Sea Scallop Workshop Program
Cape Cod Community College
July 24-25, 1995

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Appendix B

Sea Scallop Workshop Program
Cape Cod Community College
July 24 - 25, 1995

Monday July 24 9 AM

Welcoming Remarks: **John O'Brien**,Director, Cape Cod Economic Development Council
Introductory Remarks: **Harlyn O. Halvorson**,Director, PCMBT

Session I: Sea Scallop Culturing Experience

9:20 Moderator **Dale Leavitt**, WHOI Sea Grant
9:30 The current state of sea scallop culture techniques
Jay Parsons, Biol. Station, DFO. St. Andrew, N. B.
10:30 Physical, biological, and tech. considerations in siting a sea scallop aquaculture facility.
Sam NaiduDFO, St. John's, Newfoundland ,
11:15 User conflicts: Some thoughts about the legal underpinning of u, ser conflicts
Peter Shelley, Conservation Law Fndtn, Boston
Integrating new practices
Ron Smolowitz, Coonamessett Farm

Session II: Environmental and Economic Considerations

1:00 Moderator **Ron Smolowitz**, Coonamessett Farm
1:15 Some thoughts on environmental effects of sea scallop aquaculture
Don Rhoades, Woods Hole, MA
2:00 Economic considerations of sea scallop aquaculture
Mike Dadswell, Dept. Bio., Acadia Univ. Wolville, N. S.

3:00 Current and Proposed Regulations in Mass
Jim Fair, Div. of Marine Fisheries, Boston
3:45 A report to the New England Fishery Management Council in preparation for the development of a policy and management strategy for EE-Based aquaculture.
Bill Brennan, NEFMC
3:45 Discussion of break out groups topics
Dale Leavitt
Harlyn Halvorson

4:00 Roundtable

Moderator	**Eric Nelson**	NMFS Habitat Protection, Glouster
Respondents	**Judy Dutra**	Truro Aquaculture Project
	Carl Rask	Massachusetts Aquaculture Association
	Barbara Bragdon	F/V Resolute, Dennisport
	Jack Pearce	NMFS, Woods Hole
	Mark Simonitsch	Fish Weirs, Inc. Chatham
	Rod Taylor	Taylor Seafood, Fairhaven
	Cliff Goudey	MIT Sea Grant

Session III: Overview

8:00	Moderator	**Mark Forest**	Staff to Rep. Studds
	Mass. Aquaculture Initiative		
		Jay Healy	Commissioner Dept. Food and Agri.
	Organizing Break out Groups		
		Cliff Goudey	MIT Sea Grant
		Sandy Campbell	Consensus Management, Inc.

Tuesday July 25 9:00 AM

Working Group Paper Review **Dale Leavitt**
Harlyn Halvorson

Session IV: Developing Sea Scallop Policy for Mass.

9:20 Breakout groups will each be assigned specific topics, a facilitator and a rappateur. The breakout groups will each meet to discuss their issue as put forth in the Working Paper and modify the appropriate sections as deemed necessary by the breakout group.

Session V: Consensus Building

1:00 Reports of Breakout Sessions.
2:00 General discussion
Moderator **Rollin Johnson**, Kennedy Sch. of Gov. Harvard Univ.

4:00 Selection of a representative drafting committee
4:30 Future Strategies **Mark Forest**, Staff to Rep. Studds, Hyannis

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APPENDIX I

Aquaculture Policy Development

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BACKGROUND INFORMATION AND RECOMMENDATIONS FOR NEW ENGLAND FISHERY MANAGEMENT COUNCIL DEVELOPMENT OF AN AQUACULTURE POLICY AND MANAGEMENT STRATEGY

Submitted to:

New England Fishery Management Council
5 Broadway
Saugus, Massachusetts 01906

September 30, 1995

EXECUTIVE SUMMARY

Several issues have arisen that require Council decisions concerning aquaculture and other similar projects in the New England Exclusive Economic Zone, however, the Council currently lacks a policy or process for administering projects of this nature and is thus unable to provide the necessary guidance to project developers. As aquaculture is encompassed within the Magnuson Fishery Conservation and Management Act's broad definition of fishing, the New England Fishery Management Council can, at its discretion, develop management measures for aquaculture related activities within the New England exclusive economic zone.

Although various forms of aquaculture have been practiced in this country for many years, EEZ-based aquaculture is a relatively new phenomenon that has, heretofore, been focused within coastal state waters. The most significant tool used by some coastal states to manage aquaculture is the state's ability to lease, license or grant to the aquaculturist the proprietary right to use what is in essence public property. No single federal agency has been delegated lead responsibility to administer EEZ-based aquaculture, but rather, through authorities derived from various statutes, a number of agencies are involved. The ability to grant proprietary rights to the aquaculturist is not currently available to these federal agencies, however.

Many activities associated with aquaculture cannot be undertaken without modification to certain elements of existing fishery management plans, thus the New England Fishery Management Council will be petitioned by developers to amend these plans. The Council also has an obligation under the Magnuson Act to comment concerning aquaculture projects which may affect fishery habitat. Should the Council opt not to broaden its involvement with aquaculture beyond this, however, it will be relegated to advisory status and the management of user conflicts which overshadow all fishery management activities will be left to federal agencies which have neither the expertise or, and more importantly, a forum familiar to the various stakeholders within which issues can be presented and discussed.

Aquaculture is, however, a component of the New England fishery for which the Council has a responsibility and the legal authority to manage. Furthermore, the Council is the only entity with the necessary expertise and experience to effectively deal with the allocation of space and the attendant potential for conflicts between various user groups. Therefore, it is recommended that the Council play an active role in aquaculture management by developing a policy and management strategy that will facilitate the development of EEZ-based aquaculture in a fashion that does not threaten traditional fisheries and maximizes opportunities for productive coexistence.

Toward that end, several management options available to the Council are presented and discussed in this report. A range of evaluative criteria also are presented and several recommendations are offered for Council consideration as it strives to determine and delineate its role in EEZ-based aquaculture management.

RECOMMENDATIONS

Following is a list of those recommendations which have been made in this report relative to the Council's involvement with EEZ-based aquaculture.

1. The allocation of space issue is central to the aquaculture debate, the NEFMC is the only entity with the necessary expertise, experience, and statutory responsibility to effectively deal with this issue and, thus, the NEFMC should moderate this debate (page 12, paragraph 1).

2. The NEFMC should develop an aquaculture policy that will aid in the development of an aquaculture management strategy (page 12, paragraph 3).

3. The NEFMC should be circumspect in determining which issues to address in formulating a management strategy, selecting only those that are clearly germane to the Council's fishery management role (page 12, paragraph 4).

4. The NEFMC should attempt to facilitate rather than complicate an already complex federal aquaculture permitting process and should a) work closely from the outset with other involved federal agencies and b) appoint a representative to attend meetings of the Joint Subcommittee on aquaculture (page 13, paragraph 2).

5. The NEFMC should position itself as the "point of contact" for aquaculture developers, providing information and federal permit application materials in a fashion similar to the cooperative application and review procedure utilized by several states (page 13, paragraph 3).

6. The NEFMC should seek the advice of NOAA General Counsel relative to its ability to block aquaculture projects in certain instances (page 15, paragraph 1).

7. The NEFMC should seek the advice of NOAA General Counsel regarding its ability to recoup administrative costs associated with individual aquaculture projects and to determine the permit fee schedule allowed under current law (page 15, paragraph 3).

8. The NEFMC should seek the advice of NOAA General Counsel as to whether the Council is authorized to develop a Fishery Management Plan for the prospective and principally administrative management of aquaculture projects generically (page 16, paragraph 3).

9. The NEFMC should seek the advice of NOAA General Counsel regarding the degree to which NEPA requirements are applicable to EEZ-based aquaculture (page 18, paragraph 2).

MIT Sea Grant College Program
Center for Fisheries Engineering Research

Date: 15 March 1996

To: Members of the Sea Scallop Working Group

From: Cliff Goudey

Subj. Draft response to NEFMC on Brennan Report

Last year the New England Fisheries Management Council commissioned Bill Brennan to explore the issues confronting the Council with respect to aquaculture and to recommend appropriate strategies. The "Brennan Report" was issued on Sept. 30, 1995 and it has important implications for anyone interested in EEZ aquaculture.

The Working Group asked me, Sandy Campbell, Mark Simonitsh, and Mike Collins to review the report and provide a consensus response to be conveyed back to the Council. Attached is a draft response for consideration and discussion by the Group.

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Draft

March 1996

Mr. Douglas Marshall, Executive Director
New England Fisheries Management Council
Suntaug Office Park
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Dear Mr. Marshall,

The Sea Scallop Working Group (SSWG) in Massachusetts has followed with interest the Council's deliberations and recent actions with respect to the Westport Sea Scallop Project's application for exclusive use of an experimental area. We applaud the Council's approval of Amendment #6 as an responsible step in advancing sea scallop aquaculture towards its potential role as an engine for economic growth for the region.

As no doubt you, your staff, and the Council members recognize, aquaculture in the EEZ is a complicated issue. Its facilitation under the Magnuson Fishery Conservation and Management Act presents great challenges.

The SSWG has read William J. Brennan's report "Background Information and Recommendations for New England Fisheries Management Council Development of an Aquaculture Policy and Management Strategy" and we would like to take this opportunity to express both our support and some concerns regarding the process that is now facing the Council.

General - We agree with the report that EEZ aquaculture is an area that the Council has a significant interest. This view is based not only on the legal standing of the Council with respect to EEZ fisheries but also logically, based on the direct implications of aquaculture on commercial fishing and natural stocks.

Definitions - If, as the Brennan report suggests, some aquaculture hardware is fishing gear, then it should also be a candidate for a general exemption from COE permitting. This issue needs to be clarified by both agencies. There are forms of aquaculture, such as bottom-cage culture of sea scallops, that are operationally similar to fixed gear fishing, and arguably more benign. If those forms of grow-out could be exempted, it would provide significant relief for both the Council and potential practitioners.

Legal Role - The Council needs to firmly establish its legal authority to manage EEZ aquaculture and, as suggested in the report, the Council must have a clear aquaculture policy. Further, the SSWG believes that a streamlined application and review process must be developed to ensure timely processing and evaluation.

There is general satisfaction with the current ACOE permitting process and its associated agency reviews. Redundancy with the ACOE should be avoided by focusing the Council's attention on fishing conflicts and impacts on regulated stocks.

Council Staffing - The Council will need adequate resources to properly carry out its aquaculture-related tasks. Your current staff's responsibilities in the development and refinement of FMPs leaves little time for new initiatives. The SSWG feels strongly that the Council must have additional staff and funds to properly carry out its EEZ aquaculture responsibilities.

Evaluation Criteria - The Council needs to develop and publish criteria for evaluating applications. Those criteria must be developed in an open process with advice from a full range of stake holders. We would caution the Council from adopting standards which substantially exceed criteria used in evaluating fishing proposals.

Rents & Royalties - The charging of administrative costs or additional fees to aquaculture applicants should be done equitably with respect to current practices for fisheries management plans. With current fishing permit limits, Council activity is already in support of a finite number of commercial operations.

We reiterate our support of the Council in its efforts to develop and implement an aquaculture policy. The SSWG has labored for over a year, seeking to support and guide industry and institutional efforts towards sustainable sea scallop production. We would be pleased to assist the Council or its Aquaculture Committee in furthering our mutual goals.

Sincerely,

Dr. Harlyn O. Halvorsen
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Response to the Joint Subcommittee on Aquaculture on the Draft National Aquaculture Development Plan of 1996

From the Policy Center for Marine Biosciences and Technology (PCMBT)
and the Sea Scallop Working Group (SSWG)
University of Mass Dartmouth, North Dartmouth, MA 02747

Dear Sirs:

We appreciate the opportunity to comment on the draft National Aquaculture Development Plan for 1996. The JAS is to be congratulated for undertaking this essential analysis, revisiting of the U.S. governmental position, and providing an explicit description of the problem.

We fully agree that it is imperative for the federal government to assist in correction the balance of trade deficit in aquaculture and to lay the groundwork to build this important industry in this country. The impediments to aquaculture in the U.S. have been well documented, for example the Report of the National Research Council and of the Office of Technology Assessment. PCMBT participated in the latter review.

As a consequence of deliberations on how to address these impediments, PCMBT was instrumental in creating a bottom-up group, SSWG, to focus recommendations on a specific species (sea scallops) in a defined region (Massachusetts). This was done in the full understanding that the recommendations are not unique to this species or region. The result of a several year study, with a broad based group, led to the enclosed blueprint for **Sea Scallop Aquaculture in Massachusetts**. Some of the primary recommendations which are relevant to the National Plan are listed below.

1. Regulatory constraints to aquaculture.

The area from 3 to 12 miles is considered federal territorial waters, and the area from 12 to 200 miles is the Exclusive Economic Zone in which the federal government has primary responsibility. The U.S. Army Corps of Engineers, under the Rivers and Harbor Act of 1899, has regulatory authority for any structures placed in navigable waters of the U.S., including the EEZ.

A permit from the Stellwagen Bank National Sanctuary office is required for culture activities proposed within the boundaries of the Sanctuary. The National Marine Fisheries Service (NMFS), acting under the Magnuson Fishery Conservation and Management Act of 1976 (Magnson Act) and in conjunction with the New England Fishery Management Council (NEFMC), has the authority to regulate scallop aquaculture activities in the EEZ, but has not as yet set up the framework to do so in an expeditious manner. Currently, if a scallop aquaculture activity requires exclusive use of the sea bottom, changes to one or more of the fishery management plans may be required. This has proven to be a long and unpredictable process.

Each jurisdiction should be urged to identify aquaculture tracts suitable for culture and establish procedures / criteria for issuing leases within these tracts. The New England Fisheries Management Council should do this for their jurisdiction by developing an Aquaculture Fisheries Management Plan (FMP).

Request the U.S. Army Corps of Engineers (COE), in conjunction with NMFS, identify the size and scope of the operations that they will allow within Cape Cod Bay and identify the tracts of least potential cumulative impact on right whale critical habitat.

2. Permitting

Aquaculture in federal waters comes under the influence of many existing federal laws including the Fisheries Management and Conservation Act (FCMA), Marine Mammal Protection Act (MMPA), Endangered Species Act (ESA), Clean Water Act (CWA), and Rivers and Harbors Act (RHA) etc. The major impediment in developing the sea scallop project in federal waters has been the FCMA. FCMA needs to be amended to support aquaculture and resource enhancement activities. Also a Memorandum of Understanding (MOU) must be signed between NMFS, EPA, and the Army Corps of Engineers (COE) to facilitate handling of aquaculture project requests. The basic regulatory framework is in its place, there is only the need for simple adjustments and high level; policy support.

The lead agency for aquaculture permitting in federal waters should be COE. The other agencies should be involved via the conslatative process that currently exists. The major missing link is a systematic approach for addressing user questions. One way to incorporate aquaculture into the FMCA process is to appoint an industry / government team to make recommendations for federal action.

3. Culture techniques for sea scallop aquaculture

Two grow-out methods are routinely used world-wide to culture the sea scallop. The first is bottom culture, either by ranching, where the scallops are freely dispersed on the bottom, or by containment in bottom cages. The second method is suspended culture, either in a contained system (in pearl or lantern nets or suspended cages) or as individually tethered scallops (by ear hanging or individual pockets). Our recommendations are to: Promote the development of gear suitable for off-shore sea scallop aquaculture in Massachusetts waters, and support a grow-out demonstration project to compare culture techniques.

The government should support a sea scallop hatchery and enhancement project on a small scale. If results are encouraging, as they were in New Zealand, then the government should encourage expansion through a public / private venture with eventual operation being completely private. Fundacion Chilie, for example, was a quasi public agency that was instrumental in developing that countries industry.

4. Site selection

Site selection for sea scallop culture should include an assessment of an area's biological and physical parameters in order to best determine its suitability for sea scallop growth and

survival, and the technology and effort required to grow scallops economically at that site. In addition, other uses of the area need to be identified (e.g., commercial or recreational fishing, vessel traffic, whale breeding and feeding) in order to anticipate or avoid user conflicts, which could possibly result in the delay or denial of necessary permits.

One of the most important things that should be done immediately is to describe the physical and biological attributes of the Massachusetts coastal region, and after bringing these various existing data an information together, relate them to the habitat needs of the scallops. Moreover, these data have been collected and recorded in non standardized ways and formats and are divided between several private, State and Federal agencies. To achieve progress on sea scallop aquaculture in Massachusetts, coastal areas need to be classified using standard methods and that information presented using a standard format (such as provided by the Geographic Information System "GIS"), and coastal areas for which data is lacking need to be identified and the data collected. In addition, this consolidation and augmentation of information would reveal locations where there are conflicting interests between existing uses of the maritime environment and possible developments of sea scallop aquaculture. These conflicts could then be rationally examined and, it is hoped, resolved. It would further be essential to devise means whereby such information can be made available to potential experimental and commercial aquaculturists.

5. Data collecting and monitoring

The federal government should concentrate on data collection and monitoring to address aquaculture siting and resource enhancement issues. The NOAA General Council and NMFS fishery management personnel should be proactive on aquaculture issues.

Harlyn O. Halvorson

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Member SSWG

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September 15, 1996

Comments on National Aquaculture Plan
Sites in Federal Waters

(1) What are the major impediments to, and needs for, development and long term economic viability of your segment of the aquaculture industry?

Aquaculture in federal waters comes under the influence of many existing federal laws including the Fisheries Management and Conservation Act (FCMA), Marine Mammal Protection Act (MMPA), Endangered Species Act (ESA), Clean Water Act (CWA), and Rivers and Harbors Act (RHA) to name a few. In our attempt to get a sea scallop aquaculture research project underway in federal waters the major impediment has been the FCMA. Two major actions need to take place at the federal level to overcome these impediments. First, the FCMA needs to be amended to support aquaculture and resource enhancement activities. Secondly, a Memorandum of Understanding (MOU) must be signed between NMFS, EPA, and the Army Corps of Engineers (COE) to facilitate handling of aquaculture project requests. The basic regulatory framework is in place, there is only the need for simple adjustments and high level policy support. I want to emphasize tl.at there is no need for a new aquaculture act or permitting system, only modifications to existing statutes (primarily the FCMA).

I believe the lead agency for aquaculture permitting in federal waters should be the COE. The other agencies should be involved via the consultation process that currently exists. This existing system works well. EPA for discharge issues, NMFS and FWS for protected species/habitat issues, USCG for navigation issues, COE for technical design issues, etc, under the authority of existing statutes. However, there is one missing and most critical link: a systematic approach for addressing user questions. This deficiency has resulted in a long, drawn out, inefficient, public process without guidelines. The FCMA is an act that is set up to allocate marine living resources and the ocean space they occupy. This is accomplished by Fishery Management Councils which are composed of current users (resource managers, fishermen, environmentalists, etc). Aquaculture needs to be represented in this process. There are many possible approaches on how to incorporate aquaculture into the FCMA process. An industry/government team should be appointed to examine this issue and make recommendations for federal action.

(2) What do you see as a constructive federal role in light of the draft ?

a)The federal government should concentrate on data collection and monitoring in order to address aquaculture siting and resource enhancement issues. The current data collection and monitoring programs are totally inadequate in this regard. b) NOAA General Council and NMFS fishery management personnel should be informed that it is national policy to encourage aquaculture in the USA and that they should be proactive on aquaculture issues. c) If in fact it is the responsibility of the private sector to develop aquaculture then the private sector should not be inhibited by federal regulations from conducting scientific research in federal waters.

New England Fishery Management Council
5 Broadway, Saugus, Massachusetts 01906-1036
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Chairman
Joseph M. Brancaleone

Executive Director
Paul J. Howard

Meeting Notice
Joint Aquaculture Committee and Advisory Panel Meeting

Date: Thursday, March 12, 1998
Time: 9:30 a.m.
Location: Peabody Marriott Hotel, 8A Centennial Drive, Peabody, MA 01960: telephone (978) 977-9700

Agenda:

- Selection of Advisory Panel Chairman
- Review of joint agency pre-application guidelines
- Discussion of NEFMC evaluation criteria for aquaculture projects
- Initial development of a framework adjustment procedure to facilitate NEFMC project approval
- Consideration of a request to extend the timing of the closure associated with the Westport Sea Scallop Project (renamed the Seastead Site) and to allow research on habitat impacts
- Report on the status of other EEZ-based aquaculture projects

For further information or copies of any relevant documents, please call Council staff member Patricia Fiorelli at the Council office (781) 231-0422.

This meeting is physically accessible to people with disabilities.

cc: Council Members
Aquaculture Committee Advisory Panel
Aquaculture Interested Parties

TA: #98-66
Notice date: 3/3/98

NEW ENGLAND FISHERY MANAGEMENT COUNCIL
AQUACULTURE POLICY

WHEREAS, aquaculture is encompassed within the Magnuson-Stevens Fishery Conservation and Management Act's broad definition of fishing which includes the catching or taking of fish, the harvesting of fish and any other activity or at-sea operations in support of such activity, and

WHEREAS, the NEFMC has an obligation under the Magnuson-Setevens Act to make comment concerning aquaculture projects which may affect fishery habitat; and

WHEREAS, many activities associated with EEZ-based aquaculture cannot be undertaken without modification to certain elements of existing FMP's under the NEFMC's jurisdiction; and

WHEREAS, several federal agencies are involved in reviewing and permitting EEZ-based aquaculture projects although no agency has been delegated lead responsibility for management, and

WHEREAS, the NEFMC has the necessary expertise, experience and statutory authority to effectively address the issues attendant to aquaculture development in the EEZ:

NOW THEREFORE BE IT RESOLVED that the NEFMC recognizes that it has a responsibility to develop management measures that will facilitate EEZ-based aquaculture development, and

BE IT FURTHER RESOLVED that it is the NEFMC's policy to encourage biologically and environmentally sound aquaculture projects and to develop management strategies that maximize opportunities for the aquaculture industry's productive coexistence with the traditional commercial fisheries of the New England region.

ACCORDINGLY, the NEFMC will facilitate the aquaculture permitting process through the following policy objectives:

(1) The NEFMC will address those issues that are clearly germane to the Council's fishery management role and will work with other federal agencies involved in aquaculture to identify and minimize or eliminate areas of potential overlap.

(2) The NEFMC will position itself as a point of contact for aquaculture developers, to provide information and federal permit application materials, and to provide recommendations to developers which may help avoid projects or elements of those projects that would otherwise pose conflicts with the Council's management activity.

(3) The NEFMC will seek advice and guidance from representatives of both the aquaculture and fishing industries, the conservation community and other resource management agencies in formulation of aquaculture management strategies so as to minimize or eliminate the potential for user conflicts.

JOINT NEFMC/FEDERAL AGENCY AQUACULTURE ADMINISTRATION PROCESS

INTRODUCTION.

The Council's Aquaculture Policy states that the Council will facilitate the aquaculture permitting process by: 1) addressing those issues that are germane to the Council's fishery management role; 2) work with other involved federal agencies to identify and minimize or eliminate areas of overlap: 3) position itself as a point of contact to provide information and recommendations which may help avoid projects or project elements that would pose conflicts; and 4) seek advice and guidance from aquaculture and fishing industries, the conservation community and other resource management agencies. The purpose of this memo is to outline a process through which the Council can attempt to achieve the above objectives. This process includes an interagency review and permitting procedure and recommended protocols for the Council to consider in reviewing aquaculture proposals.

BACKGROUND.

The U.S. Department of Agriculture has been statutorily charged with lead responsibility for aquaculture in this country. However, with respect to EEZ-based aquaculture operations, no single federal agency has been delegated overall responsibility to administer aquaculture for purposes of permitting, etc. Rather, through authorities derived from various statutes, a number of federal agencies are involved. This situation is somewhat confused from the perspective of project developers who must complete an array of permit applications and meet a variety of requirements, some duplicative, in order to undertake an EEZ-based aquaculture operation. A permit required under Section 10 of the Rivers and Harbors Act, administered by the Army Corps of Engineers (ACOE), is the most comprehensive hurdle that a project developer must overcome and thus the ACOE is by virtue of its authority the *de facto* lead agency.

The advent of proposals to undertake aquaculture research and development projects in the U.S. EEZ raises a number of issues which break along many lines but, as the Council has already experienced, the preemption of bottom and the "privatization" of a public resource are issues which generate significant controversy. From the perspective of an aquaculturist, the inability to secure exclusive or proprietary rights can be a significant deterrent to investors and thus inhibit development. However, no federal agency has the legal authority to convey proprietary rights to the ocean bottom or water column above for the purposes of aquaculture. Allocation of space, therefore, continues to be an unsettled and contentious issue.

Representatives of federal agencies with an involvement in EEZ-based aquaculture, specifically the ACOE, the Environmental Protection Agency (EPA), and the National Marine Fisheries Service (NMFS) have acknowledged that the Council has the necessary expertise and experience to effectively deal with this 'competing use' issue and consider the Council to be a forum within which decisions relative to the allocation of space can be made. Because the Council is a quasi-federal agency, the process outlined here is proposed as an informal means of utilizing the Council's expertise to address potential space allocation conflicts prior to the initiation of formal federal agency permitting processes.

ADMINISTRATIVE PROCESS.

To accomplish the objectives articulated in the Council's Aquaculture Policy, specifically, the objective to work with other involved federal agencies to identify and minimize or eliminate areas of overlap and to position the Council as a point of contact to provide information and recommendations which may help avoid projects or project elements that would pose conflicts, the following process is recommended. This process has evolved through a number of staff level discussions with representatives of the ACOE, EPA and NMFS since a report entitled "Background Information and Recommendations for New England Fishery Management Council Development of an Aquaculture Policy and Management Strategy" was submitted to the Council in September 1995.

Federal regulation of aquaculture in the marine environment has a relatively short history and stems largely from development in coastal state waters where, because of the overlay of various state requirements, the application and permitting process can be extremely complex. To minimize the complexity, several states have or are in the process of developing a cooperative application and review procedure for aquaculture administration. Through agreement with the various state and federal agencies, the lead state agency provides an applicant with a comprehensive package that includes application material and instruction for all the necessary permits. The agency then conducts a review process that meets the standards required by the involved federal agencies. Although each agency ultimately issues its own permit, the process is significantly streamlined. Furthermore, unnecessary and protracted review is avoided in those instances where the state agency makes a preliminary determination that there is not a reasonable likelihood that a proposed project will be approved because it, among other things, unreasonably interferes with fishing.

This cooperative joint approach serves as a model for the application and review procedure proposed here. This process acknowledges that each of the various federal agencies are obligated to discharge separate statutory responsibilities in administering EEZ-based aquaculture development. This process also acknowledges that, although the Council does not have permitting authority for aquaculture *per se*, it does have authority to develop fishery management plan (FMP) recommendations for subsequent Secretarial approval to impose controls upon or sanction the activities of an aquaculture operation. Most importantly, the proposed process acknowledges the Council's preeminent role in addressing aquaculture/fisheries competing use issues and that these issues should be addressed early in the process of reviewing any proposed aquaculture venture.

To adapt the joint state/federal application and review process to the EEZ situation, the following elements are necessary: 1) a joint application of some form; 2) some means of issuing notice to interested and/or affected parties; 3) some type of public meeting or hearing to consider the proposed project; and 4) some form of interagency communication relative to the "findings" of the public meetings. Unlike the state situation where the state resource agency exercises a permitting or leasing function, the Council does not have similar authority and the ultimate permitting decision rests largely with the ACOE. However, the comments of Section 10 review agencies, including those of the Council, are most often adhered to by the Corps and the goal of the process proposed here is to "cull" or modify those projects whose Section 10 application would ultimately be rejected. Early identification of potential "flaws" in a project design or proposal will address problems that lead to protracted and costly consideration of proposals that lack sufficient merit and should give both project proposers and other interested parties an early and more rational expectation of outcomes.

The essential feature of the procedure proposed is the utilization of what is referred to as a pre-application phase which provides both project proposers and permitting agencies the opportunity to

identify unworkable project elements and overcome potential problems prior to initiation of a formal application phase which is constrained by time and regulatory procedures. It is during the pre-application phase that the Council would take the lead role and, as proposed here, this would most appropriately be undertaken by the Council's Aquaculture Committee.

The Joint NEFMC/Federal Agency Aquaculture process contemplates a three-phase approach, including: I) Pre-Application and Review; II) Formal Application; and III) FMP Amendment. Phases II and III can occur simultaneously and Phase III could utilize a Comprehensive Aquaculture Amendment or individual amendments to existing FMPs on an as needed basis to address individual aquaculture project elements.

PHASE I - PRE-APPLICATION AND REVIEW.

1. Application. A formal application in the sense of a Section 10 permit is not contemplated here, but rather, a simplified "proposal" form to the agencies would be developed. The proposal would present the who, what, and where of the project and would be used by the several agencies to determine what additional information may be necessary from the proposer in order to commence the review. The proposal format would be "standardized" and contain sections requesting specific information thought relevant to the various agencies responsibilities. The goal here, however, would be a general overview of the proposal in a simple and straightforward manner, but with sufficient detail to enable the agencies and the public to gain an understanding of the proposal and identify the issues that may complicate public acceptance of the project.

2. Coordination. The Joint Agency Aquaculture Proposal Form would be available from any of the involved agencies and it would be the responsibility of the applicant to send copies of the completed proposal to all agencies indicated on a cc list. Once a proposal has been received and initially reviewed by the recipient agencies, the Council staff would assume a coordinating role for the purposes of interagency communication to determine whether sufficient information has been received to commence a review. If additional information is sought by an agency, it would be the requesting agency's responsibility to communicate such to the proposer. Any additional information would be made available to the other agencies.

3. Notice. Once all agencies have agreed that sufficient information has been received, the review process would be commenced with the Council issuing some form of "notice" utilizing its established networks; either advisory committee lists, interested parties list, notice in trade journals or papers of record, etc. This notice would announce that the agencies are reviewing an aquaculture proposal; it would state briefly what the project is, where it is proposed to be located, who is proposing it, and what the Council's role is. The notice would also indicate how an interested person could obtain or view the full proposal and how to communicate with the Council, including when and where public meetings will be held.

4. Public Meeting. The public meetings contemplated in this process would be informal in that they would not relate directly to any permitting authority. While both the ACOE and EPA can cause a hearing to be held relative to the permits they issue, it is assumed here that applications for these permits have not been filed and, therefore, formal hearings under these authorities would not yet be available. However, according to representatives of the ACOE and the EPA, the meetings held by the Council at this stage could obviate the need for formal agency hearings once the formal application phase has been initiated. What is contemplated in this process is an informational meeting conducted under the aegis of the Council's Aquaculture Committee principally to obtain information and comments relative to those issues deemed germane to the Council's role.

Past experience demonstrates that germaneness is a relative term in Council sponsored meetings and this reality is acknowledged in this process as beneficial. The Council is principally concerned with fishery interactions, the potential effect of an aquaculture project on management objectives of extant plans, space allocation, resource utilization, cost-benefit comparisons, and fishery habitat impacts. However, other issues are likely to be raised including, design of surface structures and mooring systems, water column chemistry, genetic interactions, etc. While these issues are more appropriately considered by agencies other than the Council, it is appropriate that they be raised at the front end of the process so as to provide developers and permitting agencies with an understanding of issues needing to be addressed from the public's perspective.

Accordingly, while the proposed public meetings would be conducted under the aegis of the Council, representatives of the other agencies would also be present and could be called upon to address issues attendant to their agency's area of responsibility. A proposed format for such a meeting is as follows: opening presentation by meeting moderator; presentation and explanation of the project by the proposer; comments, questions, and recommendations from the audience including permitting agency representatives.

5. Council Review. Following the public meetings, the Council, via staff, advisory committee, and/or Aquaculture Committee representation, would work with project proposers to address Council germane issues of concern raised during public meetings. Through this effort, the Council would attempt to assuage proposers to make modifications that would ameliorate fishery interaction concerns. This is a very important component of the overall process in that it affords an opportunity to negotiate modification outside the formal Section 10 process. The incentive for the proposer to resolve issues at this stage is significant because the findings the Council forwards to the other agencies, particularly the ACOE, would have influence in the ultimate disposition of the project.

6. Council Findings. Once the Council has completed its review of the project and concluded negotiations with the proposer, it would forward its "findings" to the other agencies involved in the process, making recommendations concerning the overall project or project elements. It is important to recognize that a project proposer legally has to right to submit a Section 10 application at any time, prior to or during the process proposed here. However, because the *ACOE has expressed a desire to involve the Council in decisions relative to aquaculture/fishery interactions issues,* submitting a Section 10 permit application before this joint NEFMC/Federal Agency process is complete will not necessarily expedite the process. In fact, because an agency "clock" is initiated once the Section 10 application is received, a failure to resolve aquaculture/fishery issues could ultimately lead the ACOE to close the proceeding or deny the permit.

PHASE II - FORMAL APPLICATION.

The information provided below outlines the authorities, permits, and formal review procedures required by several federal agencies for aquaculture ventures proposed in the EEZ.

Army Corps of Engineers. The ACOE authority stems from Section 10 of the River and Harbors Act of 1899, Section 404 of the Clean Water Act, and Section 103 of the Marine, Protection, Research and Sanctuaries Act. The Corps' traditional and primary role relates to the potential impact of activities upon the navigable waters of the U.S. With regard to aquaculture, it is particularly concerned with structures and the mooring systems used to anchor these structures within the navigable waters. However, its authority extends to a full range of other considerations including those related to the environment and its permit certifies that the project will not impede

navigation or negatively affect environmental quality.

Applicants seeking an ACOE permit to install and maintain aquaculture facilities are required to provide general information about the proposed project, siting and operational information, an environmental description and impact assessment of the proposed project area, and the applicant may be required to complete environmental monitoring of the site. The information required by the Corps is also used by Section 10 review agencies such as the National Marine Fisheries Service (NMFS), the U.S. Fish and Wildlife Service (USFWS), the Environmental Protection Agency (EPA), the Coast Guard, and the Council.

Permits for EEZ-based aquaculture are administered by the ACOE Regional Division in Waltham, Massachusetts. A public hearing is not required, however, hearings will be held if it is determined by the District Engineer to be necessary or appropriate given the specifics of a particular project. Other federal agencies such as NMFS, USFWS, EPA, the U.S. Coast Guard, and the Council, serving as review agencies under provisions of Section 10 do not have "veto" authority, however, their comments and recommendations are usually adopted by the Corps as conditions and restrictions of the permit.

Environmental Protection Agency. Section 402 of the Federal Water Pollution Control Act established the National Pollutant Discharge Elimination System (NPDES) to ensure that point source discharges would not impair the nation's water quality. The EPA, which has statutory authority to administer NPDES permits, has determined that floating fish pens constitute "concentrated aquatic animal production facilities" under the Act and are thus subject to permit requirements. The agency has also determined that the Ocean Disposal Criteria of section 403(c) of the Act applies, thus mandating an environmental effects review of aquaculture projects proposed for offshore waters.

Currently, the EPA requires an NPDES permit for fish pen operations only; shellfish or other "low impact" aquaculture operations are administratively exempt, however, a broad interpretation of the Act's "concentrated aquatic animal production facilities" language could be construed to apply to these operations as well.

A "general" NPDES permit is not currently available for offshore aquaculture operations although there has been some discussion within EPA towards that end. A "common permit" was available for offshore oil and gas exploratory drilling facilities in the 1980s and a "general permit" is available for inshore aquaculture facilities, thus a precedent does exist in this regard. Until such time as a common permit is established, individual projects are required to seek a permit from the EPA Region I office in Boston, Massachusetts. The time frame for completion of the permitting process can be several months and, although a hearing is not required, the Region can cause one to be held should it appear necessary.

National Marine Fisheries Service. The National Marine Fisheries Service has regulatory authority to enforce measures adopted pursuant to Council or Secretarial FMPs. The harvest of Atlantic salmon in the EEZ, for example, is currently prohibited under provisions of a Council FMP and the taking of other species is restricted in a variety of ways including minimum size restrictions and vessel permit requirements which are enforced and administered by NMFS. As aquaculture facilities are subject to the Magnuson-Stevens Fishery Conservation and Management Act, the Service does have direct regulatory control over aquaculture, albeit incidental to management plans for other fisheries at this time.

In the absence of an aquaculture focused FMP, the Service's principal role vis-a-vis aquaculture is with respect to its statutory authority to administer the Marine Mammal Protection Act, its statutorily shared responsibility with the U.S. Fish and Wildlife Service to administer the Endangered Species Act, and its prerogatives as a review agency under Section 10 of the Rivers and Harbors Act, the Fish and Wildlife Coordination Act, and the National Environmental Policy Act.

As a review agency, the Service can provide comments regarding interactions with marine mammals and other protected species, impacts to the benthic environment and water quality, the possibility of deleterious genetic impacts and disease transmission to wild stocks. The Service has requested that ACOE permits be conditioned to require that salmon aquaculture facilities comply with protocols established by the North Atlantic Salmon Conservation Organization, of which the United States is a member, and the guidelines established by the New England Salmonid Health Committee. Depending upon the source of smolt used in salmon aquaculture, a fish health certificate and importation permit may be required.

The Service's parent agency, the National Oceanic and Atmospheric Administration (NOAA), also administers the Coastal Zone Management Act, which requires a consistency determination with approved state coastal zone management programs for federally permitted activities that affect land, water, or natural resources of the coastal zone; and the Marine Protection, Research, and Sanctuaries Act which prohibits certain activities within areas designated as National Marine Sanctuaries and requires consultation with NOAA's National Ocean Service in some instances.

U.S. Coast Guard. U.S. vessels, including barges, that support aquaculture facilities and that measure five net tons or larger must obtain Coast Guard documentation. Beyond vessel documentation requirements, the Coast Guard's interests pertain to navigational issues, including the design, placement, anchorage, and marking of structures within navigable waters. A Private Aid to Navigation Permit is required as is documentation confirming that applicants have read the applicable regulations pursuant to 14 U.S.C. 83 - 85. Permits are available from the 1st Coast Guard District in Boston.

Other Federal Agency Involvement. Beyond the agencies and activities outlined above, there are several other federal agencies that may have involvement with EEZ-based aquaculture depending upon the nature of the venture. These agencies include the U.S. Fish and Wildlife Service as a review agency under Section 10 addressing issues somewhat related to those that would be of concern to the NMFS and the U.S. Food and Drug Administration if the use of medicated feeds is contemplated.

PHASE III - FMP AMENDMENT AND FRAMEWORK ADJUSTMENT.

Many activities associated with aquaculture cannot be undertaken without modification to certain elements of existing fishery management plans. Should the Council find that a proposed aquaculture project has merit and if project element are in conflict with management provisions such as minimum fish size restrictions etc, the Council will be called upon to amend one or more FMPs to enable the venture. As mentioned above, Phase III of the process outlined here can occur in parallel with federal permitting Phase II. However, the Council must decide upon an amendment strategy.

The preferred management approach to minimize the burden on the Council to amend existing FMPs separately for each aquaculture project proposed would be through the development of one

overarching aquaculture FMP. Through this Aquaculture FMP, permissions or exemptions for aquaculture activities that are otherwise prohibited in all existing FMPs would be addressed comprehensively and prospectively. Once this is accomplished, individual aquaculture project proposals can be administered by the Council without need for FMP amendment and, thus, Phase III as contemplated in this process would be unnecessary. Unfortunately, this approach is not currently available to the Council because of Magnuson-Stevens Act prohibitions on the use of FMPs for principally administrative or process oriented purposes. It is recommended that the Council seek the advice of NOAA General Council as to the most appropriate way in which to communicate to the U.S. Congress the need to amend the Act to enable the development of an Aquaculture FMP.

Until such time as the Council has the statutory ability to develop an Aquaculture FMP, the alternative is to develop a comprehensive FMP amendment similar to that for the Multispecies, American Lobster, and Atlantic Sea Scallop Fishery Management Plans for resolving gear conflict in the Gulf of Maine, Georges Bank, and Southern New England. An amendment of this nature, with framework provisions included, will enable the Council to address individual project elements without requiring iterative amendment to other FMPs each time a new aquaculture project is proposed. With a comprehensive amendment of this nature in place, the Council would use framework provisions to address individual aquaculture project elements during Phase III. Without a comprehensive amendment, the Council would develop necessary amendments to existing FMPs to enable specific project elements during Phase III.

To address the aquaculturists need for some degree of proprietary access, the Council can ascribe a modicum of exclusivity to certain uses of an area through establishment of Special Management "Zones" as authorized in Section 303(b)(2) of the Magnuson-Stevens Act. The Council should also consider the designation of "aquaculture zones" to enhance planning and development of aquaculture sites or, alternatively, to identify productive fishing grounds as areas that would not be suitable as aquaculture sites.

JOINT AGENCY OFFSHORE AQUACULTURE PRE-APPLICATION GUIDELINES

DRAFT

Introduction. Several federal agencies are involved in permitting activities associated with aquaculture in the offshore waters of New England (3-200 nautical miles) referred to as the Exclusive Economic Zone (EEZ). To lessen the potential for confusion and to facilitate the transfer of information between prospective aquaculturists and involved agencies, these guidelines have been jointly developed by the New England Fishery Management Council, the U.S. Army Corps of Engineers, the National Marine Fisheries Service, and the U.S. Environmental Protection Agency.

Location is critical to the success of an aquaculture project and, therefore, site selection is important to both the aquaculturists as well as to permitting agencies. An appropriate site is one with suitable environmental conditions to support the proposed activity and one which does not conflict with other uses of the area. To ensure that a reasonable site has been selected, and to avoid unnecessary delays once the formal application process begins, a joint agency pre-application review process has been developed to provide an initial review of siting and locational issues. The purpose of these guidelines is to briefly explain the pre-application process, to provide a summary of project descriptors that the agencies will review to assess the nature and scope of the proposed project, and to provide mailing addresses and phone numbers for contacts in the various agencies.

Process. The pre-application review process will be coordinated by the New England Fishery Management Council (NEFMC) with assistance from other involved federal agencies. This 'pre-application' is not a requirement, however, the federal agencies have identified it as a desired coordination step to expedite the formal regulatory review process. A project review can be initiated by sending to each review agency one copy of a narrative project proposal responding briefly to the project descriptors outlined in the section below. Once proposals have been received and the joint agency group has become familiar with it, a public meeting will be scheduled by the NEFMC. The meeting will be a forum for exchanging information among all interested user groups. Following the public information phase, the NEFMC, in consultation with the project proposer and other interested parties, will attempt to resolve any issues of concern which may have been identified. Resolution of issues will facilitate the formal regulatory review process.

Project Descriptors:

Summary. Describe in brief the nature and purpose of the proposed project, providing an explanation of any background activities supporting the project and a description of communication with other users of the area.

Who. Describe the technical experience and expertise of those involved directly or indirectly in the project and provide a summary business plan including goals and objectives for the venture proposed to be conducted.

What. Describe the nature of the proposed project, whether it is to be production or demonstration scale, the type of activity contemplated, species to be cultured and its source, and the expected biomass production of the cultured species.

Where. Describe, and depict on an appropriate NOAA chart, the location of the site proposed for the project, including its coordinates (latitude/longitude), known site condition including indigenous species, and current uses of the area.

How. Describe the species retention and mooring system proposed including the dimension of its footprint, its elevations and profile, and the nature of the shoreside logistical support including the proposed port of operation.

Agency Contacts:

New England Fishery Management Council
Attn: Aquaculture Coordinator
5 Broadway
Saugus, MA 01906-1036
(781) 231-0422

U.S. Army Corps of Engineers
Regulatory Branch
424 Trapelo Road
Waltham, MA 02254-9149
(781) 647-8491

National Marine Fisheries Service
Habitat Conservation Division
One Blackburn Drive
Gloucester, MA 01930
(978) 281-9102

U.S. Environmental Protection Agency
Attn: Aquaculture Coordinator
CWQ, JFK Federal Bldg.
Boston, MA 02203-2211
(617) 565-3582

DRAFT

POTENTIAL REVIEW AND EVALUATION CRITERIA FOR NEFMC CONSIDERATION

In reviewing an aquaculture project proposal and during any subsequent FMP amendment that may be necessitated, the Council should have established standards for evaluation of individual projects. Appropriate standards would relate to the competing use issues, the potential impact to management objectives or fishery habitat, and the nature of the project and capabilities of the applicant.

Competing Use.

1. The proposed activity should not unreasonably interfere with other uses of the area, considering such factors as the number of individuals that participate in commercial or recreational fishing, the type of fishing gear utilized, the number of actual fishing days and the amount of fisheries resources harvested from the area.

2. Projects requiring less exclusivity, given the nature of other uses in or near the area including the number, size, location and type of other aquaculture uses of the area, should be encouraged.

3. If a project proposes to foreclose the fishing rights of others, a single entity should not receive excessive benefits with respect to other user groups and projects that propose to enhance harvesting opportunities for displaced fishermen should be encouraged.

4. Projects proposed by displaced fishermen and projects that are owner-operated should receive preferential treatment.

5. In the event that competing projects are submitted for review, a first come first serve review policy should be adopted.

6. Projects that maximize biological, social and economic values should be encouraged.

Management Objectives and Habitat Considerations.

1. A project must be consistent with objectives of Magnuson-Stevens, extant FMPs for the area or species in question, and other applicable law.

2. The project should present acceptable biological, social and economic impacts (direct, indirect and cumulative).

3. Projects that remove pressure from or enhance wild stocks or that create fishing opportunities directly or indirectly should receive preferential treatment.

4. A project should be compatible with the long term ability of the area to support ecologically significant flora and fauna, marine vegetation, and disrupt fish migration.

Scope of Project and Applicant Expertise.

1. Projects that are large in size and scale and lack thorough justification should be discouraged.

2. A project developer should be able to demonstrate the necessary technical and business expertise to undertake the project.

3. The project developer should be able to demonstrate that there is an available source of the organism to be cultured and, given the nature of the project, that there is a likelihood that the project can receive all necessary and relevant permits.

4. Pilot or demonstration type projects should be encouraged initially to better evaluate impacts and an expedited review process should be used for projects of this nature.

Language for Inclusion in the Groundfish, Sea Scallop, Herring, and Atlantic Salmon (EFH) Public Hearing Documents

Background In August, 1997 the Council voted to amend all NEFMC fishery management (FMPs) to include a framework adjustment process that would facilitate the timely approval of aquaculture projects that would otherwise require a full plan amendment. Since the concept of approving aquaculture projects through frameworks is a new addition to the list of "frameworkable" measures already listed in several Council FMPs, the public must be given an opportunity to comment on this proposal. For the sake of efficiency, consideration of an aquaculture framework adjustment process has been added to the FMP amendments now being developed to bring all NEFMC plans into compliance with the Sustainable Fisheries Act.

Assigning a new purpose to measures that are part of a framework adjustment process requires adoption of a plan objective that is consistent with the framework action. For example, in the Multispecies FMP, the Council adopted a plan objective to reduce harbor porpoise bycatch in order to establish gillnet time/area closures through framework adjustments. Consequently, the following objective will be added to each FMP: *to facilitate the siting of biologically and environmentally sound aquaculture operations in the EEZ, given that some projects cannot occur in federal waters without modification to one or more NEFMC fishery management plans.*

Process The framework adjustment process that already exists in the Groundfish and Scallop FMPs allows the Council to modify specified plan measures more quickly than by preparing a full plan amendment. In those plans, the proposed modification is announced in advance of at least two Council meetings and public comments are taken at each of those meetings prior to a final Council vote on the issue.

Additionally, a document containing the measure(s) proposed, other alternatives under consideration and the biological and economic impacts of the measures is made available at least a week before the meeting at which the final vote is scheduled. If an action is approved, the Council forwards its recommendation to the National Marine Fisheries Service Regional Administrator (RA). If the RA concurs with the framework adjustment, he has the discretion to publish it either as proposed or final regulations in the *Federal Register*.

In the existing framework process, there are other factors which are weighed during consideration of an adjustment. They include: a) whether the availability of data on which the recommended management measures are based allows for adequate time to publish a proposed rule, and whether regulations have to be in place for an entire harvest/fishing season; b) whether there has been adequate notice and opportunity for participation by the public and members of the affected industry in the development of the Council's recommended management measures; c) whether there is an immediate need to protect the resource; and d) whether there will be a continuing evaluation of management measures adopted following their implementation as a final rule.

For aquaculture projects in the EEZ, the Council's recommendations on adjustments or additions to management measures must come from one or more of the following categories: minimum fish sizes, gear restrictions, minimum mesh sizes, possession limits, tagging requirements, monitoring requirements, reporting requirements, permit restrictions, area

closures, establishment of special management areas or zones and any other management measures currently included in the FMP.

Rationale The Council proposes the use of the above-described process to make necessary adjustments to Council FMPs which apply to EEZ-based aquaculture projects. The intent is to make changes to FMPs in a timely manner. During this process, the Council will address issues within its purview, including user group conflicts and fishery habitat-related issues, but will not pre-empt the role of the permitting agencies, the Army Corps of Engineers and the Environmental Protection Agency.