Cooperative Resource Management Plan for the Bay Scallop *Argopecten irradians* in the Menemsha Pond Complex
June 2017

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Prepared by: Marcella Andrews and Elizabeth Finn, Wampanoag Tribe of Gay Head (Aquinnah) Natural Resources Department, 20 Black Brook Road, Aquinnah, MA 02535

APPROVED BY:

Wampanoag Tribe of Gay Head (Aquinnah) Natural Resources Department Director:

_____ Date:_____

Bret Stearns, NRD Director
The Wampanoag Tribe of Gay Head (Aquinnah)
20 Black Brook Road, Aquinnah, MA 02535
Tel: 508-645-9265, Email: bstearns@wampanogtribe.net

Town of Aquinnah Shellfish Constable

_____ Date:_____

Brian Vanderhoop, Shellfish Constable/Harbor Master
953-55-57 State Road
Aquinnah, MA. 02535
Tel: 508-645-2307

Town of Chilmark Shellfish Constable

_____ Date:_____

Isaiah Scheffer, Shellfish Constable
Chilmark Town Hall
P.O. Box 119
Chilmark, MA 02535
Tel: 508-645-2100 ext. 2145, Email: ischeffer@chilmarkma.gov

This Shellfish Plan was developed by:

Marcella Andrews and Beckie Finn, Natural Resources Department, Wampanoag Tribe of Gay Head (Aquinnah)

With Assistance from:

The Town of Aquinnah:

Selectboard: Jim Newman, Gary Haley and Juli Vanderhoop
Shellfish Constable/Harbor Master: Brian Vanderhoop
Town Administrator: Adam Wilson

The Town of Chilmark:

Selectboard: Warren M. Doty, William Rossi and Jim Malkin
Shellfish Constable: Isaiah Scheffer
Harbor Master: Dennis Jason, Administrative Assistant: Virginia Jones
Executive Secretary: Timothy R. Carroll

The Martha's Vineyard Shellfish Group, Inc

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Special thanks to the team who put together the 2012 Nantucket Shellfish Management Plan, which served as a valuable template in which to craft this one.

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GLOSSARY OF ACRONYMS AND TERMS

Adult-mature scallop that is able to reproduce and is legal size to harvest

Bushel- a container used to collect and measure shellfish caught; holds 9.6 fluid gallons. A struck bushel is when the contents are flatly leveled on top so none are above the fill line.

DMF-Division of Marine Fisheries

EPA-Environmental Protection Agency

HAB-Harmful algae blooms

Juvenile-Young scallop that has developed from larval form but not fully mature yet.

Larvae- the free-swimming immature form of scallops

MA DEP Massachusetts Department of Environmental Protection

MVSG-Martha's Vineyard Shellfish Group

NDR-Natural Resource Department

Nub scallops-scallops that have undergone a shortened growth period and whose growth rings are 1-20 mm from hinge; such scallops may not be fully matured despite size.

Seed/spat-juvenile scallops introduced to a water system for population management or enhancement purposes.

Set- the resting of larval or juvenile shellfish in a water system

WTGHA-Wampanoag Tribe of Gay Head Aquinnah

SECTION 1: INTRODUCTION

The Natural Resources Department of the Wampanoag Tribe of Gay Head (Aquinnah) shares a good working relationship with the Towns of Aquinnah and Chilmark. The Tribe has for many years worked cooperatively on environmental enhancement projects that protect and enhance natural resources beyond Tribal boundaries. The Menemsha Pond complex, comprising Menemsha, Squibnocket, Stonewall, and Nashaquitsa ponds, is divided into three separate jurisdictions between the Tribe, Town of Aquinnah, and Town of Chilmark. Each jurisdiction manages the land and water resources independently. While there is support between jurisdictions in times of emergency and times of need, the lack of a coordinated Resource Management Plan has dramatically reduced the efficiency of each jurisdiction and the ability to implement habitat improvement. It is hoped that this Cooperative Management Plan for the Menemsha Pond complex would not only ensure the proper management of the bay scallop (*Argopecten irradians*) resource in Menemsha Pond, but also create a framework for management of other important resources, such as American oysters, herring species, winter flounder, American eels, and any other resource found in the connected pond system. The management plan should also be used as a platform to resolve historically difficult issues between parties, such as reciprocity between Town and Tribe field staff, uniform regulations between towns, uniform oil-spill response and creating a dredging plan for Menemsha Pond.

As a highly seasonal economy with few sources of year-round employment, shellfish provide a way for residents to diversify and supplement their income. The bay scallop is important culturally and commercially to both the Tribe and the Island as a whole. Found naturally in Menemsha, Nashaquitsa, and Stonewall Ponds, the scallop population had fallen dramatically. Actions undertaken by the Tribe and by the towns, through the assistance of the Martha's Vineyard Shellfish Group, Inc. and various federal and local funding agencies have helped to enhance the current bay scallop population in Vineyard waters. It is not only the Island's highest value fishery, but it is also important because it is a winter fishery and provides income when the summer economy has subsided.

Bay scallops were once abundant in coastal waters of the eastern United States from North Carolina to Maine. Massachusetts scallop fisheries have seen a widespread decline since the mid-1980s. Many scientists point to poor water quality as the primary culprit. Water pollution from increased tourism, coastal housing developments, and fertilizer runoff adds more nitrogen to the water, which accelerates algae growth. As algae density increases, water clarity decreases. This affects the amount of sunlight that can penetrate the water to reach the eelgrass meadows, the bay scallop's habitat. As a result, bay scallop fisheries in most other locales are gone as well, or at best emerge briefly when the few remaining spawners produce a fortuitous set.

Martha's Vineyard is fortunate in its offshore location, more distant from the terrestrial impacts that have affected other coastal waters. Population density and development have been lower, and slower to increase on the island than in most other coastal areas. The

threats of shoreside contaminants as well as environmental factors such as climate change and the incursion of invasive species continue to grow in Vineyard waters, risking the future of bay scallops as well as mussels, clams, oysters and other shellfish. Although people continue to make a living harvesting shellfish, many do so with concern for the future of the resources and habitats that support them. This Shellfish Management Plan provides an historical description of shellfishing in Menemsha addresses some of the existing pressures on shellfish resources and their habitats, outlines a strategy to fill data gaps that will potentially affect management decisions, and makes recommendations to promote sustainable commercial and recreational shellfisheries in the Menemsha Pond Complex. For the purposes of this Plan, "sustainable" refers to (1) maintaining a viable fishery for (at a minimum) the current number of people actively harvesting shellfish; and (2) maintaining/improving habitats and other factors that lead to a healthy shellfish population.

In order to most effectively address the needs of the fishery and preserve our local and national heritage, the Shellfish Management Plan aims to meet three guiding principles, namely management that is:

- Community-based, involving decision-making by, addressing the needs of, and spreading responsibility among as many local stakeholders as possible.
- Ecosystem-based, accounting for the interconnectedness of multiple physical, chemical and
- Adaptive, designed to learn from the outcomes of previous management actions and to respond and evolve quickly and purposefully.

Assessment of Needs

The Wampanoag Tribe has a deep cultural and economic history with Menemsha Pond and its associated waters. For 10,000 years these ponds and streams have fed the Wampanoag people. The Tribe's Natural Resources Department has a shorter but very successful history with these waters: monitoring the water quality and biological health, restoring the bay scallop fishery, and partnering with the towns of Aquinnah and Chilmark to develop a comprehensive management plan for the pond complex. The Menemsha Pond complex, comprising Menemsha, Squibnocket, Stonewall, and Nashaquitsa ponds, is divided into three separate jurisdictions between the Tribe, Town of Aquinnah, and Town of Chilmark. With the progress made under the Tribe's most-recent TWG, the hope is that each jurisdiction will manage the water resources cooperatively.

SECTION 2: PURPOSE, SCOPE, PLANNING PROCESS, AND LARGER CONTEXT

The island of Martha's Vineyard as a whole is invested in keeping the shellfish resources healthy and sustainable. The initiation of the Menemsha Pond bay scallop management plan includes many already in-place practices the six towns utilize. The goal of making the scallop population continually viable commercially, recreationally and for tribal sustenance, hinges on the implantation from each jurisdiction.

The planning process was aided by the Tribe's Natural Resources Department familiarity with the scallop population as well as the ponds characteristics. As a native people, the Wampanoags feel an obligation towards the stewardship of the land and waters that sustain them, and which they so closely value and respect. As such, it is the duty of the Tribe's Natural Resources Department to establish and manage such environmental programs on Tribal lands, and beyond. In combining that information with the towns' management practices and outcomes, the community-based plan grew along with recommendations from other shellfishing towns on along the east coast.

The shellfish resources of Menemsha Pond should be managed to support a viable and continuing shellfishery for both economic and traditional purposes by:

- Maintaining or improving the habitat associated with a healthy bay scallop population
- Maintaining or enhancing the populations and health of scallops

Efforts by the towns and tribe have and are continually made to maintain a healthy environment for harvestable resources and for infrastructure and recreational use within Menemsha Pond as well as the surrounding waters. The construction of this plan encompasses historic and present anthologies for shellfish and water quality management. These comprehensive sections create a network including the additional developments the towns' and tribe have undertaken. Efforts including road, culvert and storm sewer maintenance and natural sediment restoration enviably support many components of Menemsha Pond. This plan is designed around the bay scallop initially, but will aspire to further include additional economic and culturally relevant species.

SECTION 3: GENERAL CHARACTERIZATION OF THE MENEMSHA POND COMPLEX AND ITS SHELLFISHING RESOURCES

Like all of Martha's Vineyard, Aquinnah and Chilmark are economically driven by tourism. Menemsha is a working fishing town and its economic value pairs with cultural interest from the increased seasonal population. Balancing the demand tourism brings with local growth and development and the integrity and health of its cultural and natural resources is a continuous goal for all sectors.

The bay scallop commercial fishery represents a large economic value on Martha's Vineyard, providing income to fishermen during the off season. In addition, bay scallops represent historic and cultural significance to Menemsha harbor and the Wampanoag community. Scallop populations fluctuate year to year and are hard to predict, making management necessary but difficult. In 2010, Aquinnah and Chilmark reported around 1,500 bushels harvested commercially, followed by small harvests and shortened seasons in 2011 (Aquinnah and Chilmark Town Reports, 2010-2011).

Along with commercial and recreational shellfishing and fishing, Menemsha pond accommodates the commercial transport of people and goods, swimming, and recreational boating. Other commercial shellfisheries include quahogs, mussels, and conch. Recreational shellfishing is also popular given the Island's productive habitat, strong tradition of family scalloping, and large seasonal influx of tourists. Recreational shellfishers harvest bay scallops, soft shell clams, quahogs, oysters, and mussels. In addition to shellfish, other fishery resources harvested by island fishermen include lobsters, summer flounder, striped bass, bluefish, eels, black sea bass, tuna, sharks, cod, haddock and other groundfish.

SECTION 4: CHARACTERIZATION OF THE POND'S ENVIRONMENTS AND HABITATS

Menemsha Pond is a saltwater pond that is fed directly by the moving tides of the Atlantic Ocean. The pond is approximately 790 acres, and is part of a watershed containing 1760 acres. Attached to Menemsha Pond are two additional saltwater ponds; Nashaquitsa and Stonewall Pond. These ponds are fed by Menemsha Pond with small contributions from groundwater recharge. The combined acreage of Nashaquitsa and Stonewall Pond is roughly 120 acres. Menemsha Pond also connects to a 600 acre brackish pond known as Squibnocket. Squibnocket Pond is fed by a number of small streams and brooks as well as groundwater recharge within its own 1280 acre watershed. Squibnocket and Menemsha Pond are connected by a narrow creek stretching 1/3 of a mile. This creek, known as the Herring Creek, also serves as an anadromous fish passage for both Atlantic Blueback Herring (*Alosa aestivalis*) and Alewife (*Alosa pseudoharengus*), allowing them to access breeding grounds within Squibnocket Pond. In addition to the Herring Creek, Tribal lands contain two streams that contribute to the watershed; Black Brook, which drains into Squibnocket Pond, and Occooch Stream, which fills Occooch Pond, one of the many kettle ponds found within Tribal lands (WTGHA Natural Resource Department, 2015).

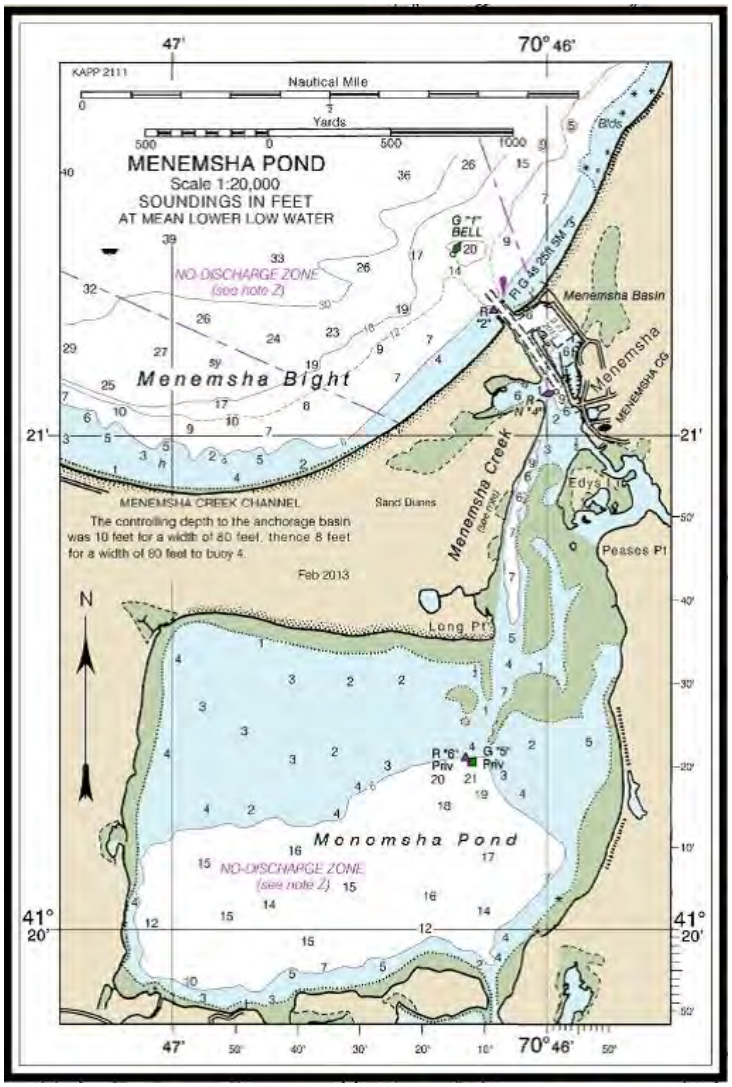

Figure 1: Depths in feet of the Menemsha Pond Complex

Water Quality in the Menemsha Pond Complex

The water quality of the Menemsha Pond Complex is monitored consistently throughout the year. The Tribe of Gay Head (Aquinnah) Natural Resources Department operates a surface-water quality monitoring program on and surrounding Tribal lands that provides data to Tribal programs, as well as the Island community and the State. As a fundamental water quality program, the monitoring strategy largely focused on the acquisition of data and information that would be pertinent for the protection of the local water bodies. The goal is to assess the presence and concentrations of various water quality criteria and contaminants in the Menemsha Pond Complex in order to help maintain the physical, chemical, and biological integrity of these waters.

These water bodies are subject to considerable human use including boating, swimming, fishing, and shellfishing as well as residential and commercial development of the nearby shorelines. These uses all have potential impacts on the water quality including nutrient loading, algae growth, oxygen depletion, and bacterial and organic and heavy metal contamination. By identifying factors that impact aquatic life and water resources, we can improve the health of the ecosystem by implementing corrective and preventative measures when needed.

It has become evident through the past 5 years of data elevated levels of both total coliform and *E. coli* bacteria continue to rise within the Menemsha Pond Complex. While the presence of these bacteria can be expected with an ecosystem, their elevated levels could pose a health risk those who use the pond for recreational actives. Reasons for this increase possibly stem from an increased presence of water fowl, agricultural runoff, and faulty septic, just to name a few.

While the Menemsha Pond Complex retains low levels of nitrate and nitrite, even when spikes flux outside their normal range, levels considered detrimental to the ecosystem are neither reached nor maintained. Nitrogen loading is a critical water quality parameter affecting the island as a whole. As a result, future water testing programs will focus collecting data on total nitrogen as a water quality parameter. The information will help better quantify nitrogen and its effects to the ecosystem.

Nitrogen, along with phosphate and other nutrients can introduced into a water system, coming from septic systems, fertilizers and runoff. These excess nutrients serve as fertilizer, feeding algal blooms. The algal blooms increase turbidity and shading of the sea floor, depriving plants (such as eelgrass) of the light needed to photosynthesize. Additionally, the decomposition of algae creates conditions of low dissolved oxygen, which can lead to the death of marine organisms.

Harmful algal blooms (HAB) and other toxic plankton are always cause for concern. As recently as October 2016, a state ordered shutdown for shellfish extended to Martha's Vineyard, caused by a toxic diatom. Scalloping is allowed during most of these closures because the animals' abductor mussel that is consumed is not impacted by the algae. While the edibility of scallops is not impacted, the health, body condition and in some instances, survival of seed scallops may be affected (Gobler et al., 2008). Additionally, bacterial (fecal and, to a lesser extent, non-fecal) coliforms from animal and human sources can shut down fishing in shellfish beds for species where the entire animal is consumed.

An acidic pH can have a large effect on an aquatic ecosystem, especially in the consideration of growth, reproduction and survival of both flora and fauna. As observed over the past 5 years of data, pH has showed a downward trend in the Menemsha Pond Complex. In fish species, young fish and immature stages of aquatic insects (their food) are extremely sensitive to pH levels below 5 and may die at these low pH values. Changes in pH can also affect aquatic life indirectly by altering other aspects of water chemistry. Low pH levels

accelerate the release of metals from rocks or sediments in the stream. These metals can affect a fish's metabolism and the fish's ability to take water in through the gills, and can kill fish fry. Low pH also influences the availability of nutrients vital for plant life to flourish.

Developing shellfish larvae are also greatly affected by changes in pH. This poses a potential threat to shellfish within proximity to the shore. The effects of ocean acidification have been shown to affect survival rates of free swimming shellfish larvae (i.e. bay scallops) by weakening their ability to produce shell, which is crucial in their early stages of life. Eelgrass beds, which are home to bay scallops, located along the south east to south west of Menemsha Pond only extend about 200 feet off shore and may be negatively affected by this drop in pH.

While short term or seasonal fluctuations in monitored parameters can be correlated with a specific event, only long-term trends make it possible to view the health of the Menemsha Pond Complex as a whole. By measuring and mapping out the numerous environmental variations with this ecosystem, a natural level of pond health can now be used for comparative studies.

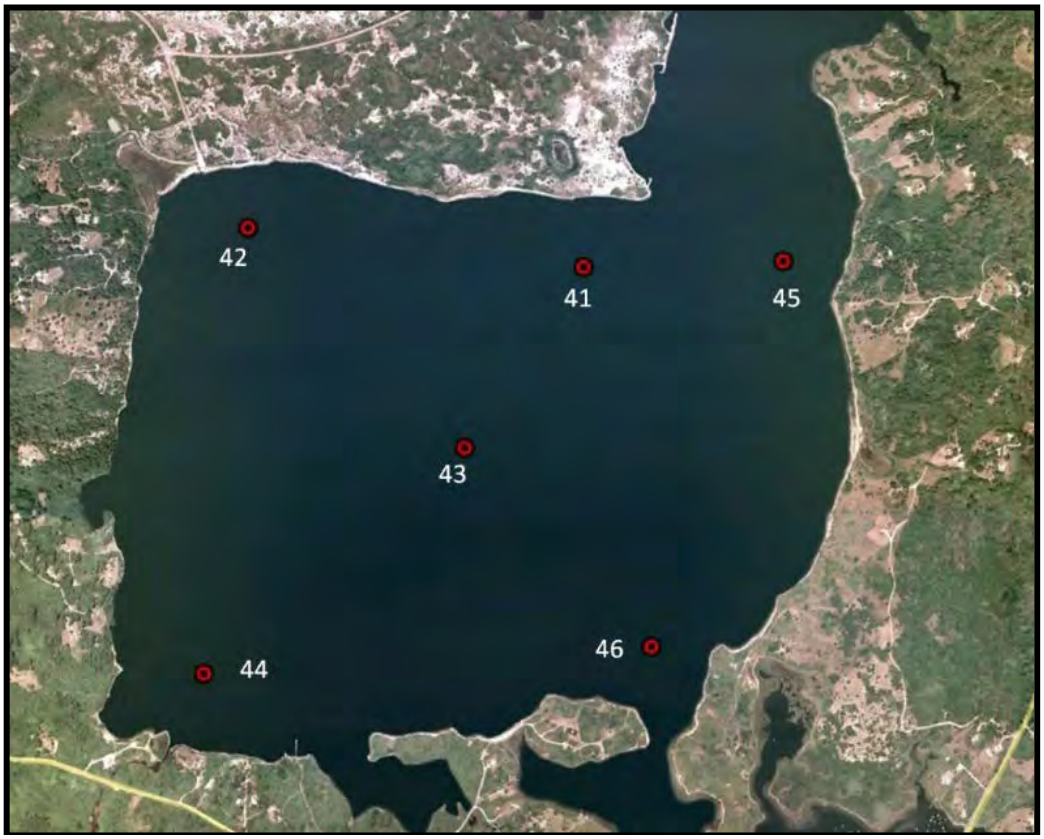

Figure 2: Map of Menemsha Pond sampling locations

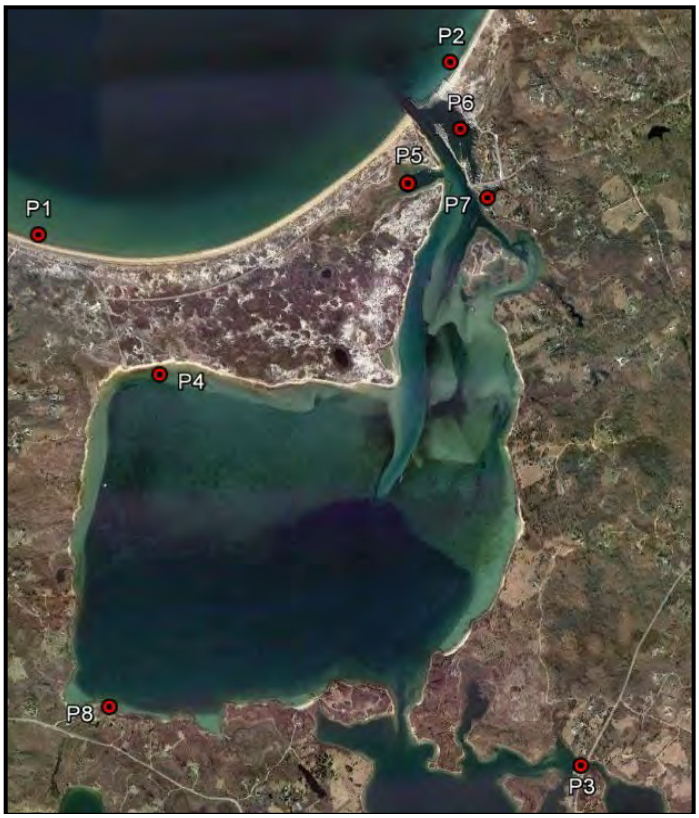

Figure 3: Map of Menemsha Pond perimeter sampling locations

Figure 4: Map of Squibnocket Pond sampling locations

SECTION 5: DESCRIPTION OF THE RESOURCES HARVESTED AND THEIR HABITATS

Bay Scallops - Biological characteristics and environmental requirements

The northern bay scallop (Argopecten irradians irradians) is a bivalve distributed along the east coast from Cape Cod to Maryland. It has a nearly symmetrical ribbed shell, a pair of equal-sized ears at the hinge, and a white to dark brown or gray color. Bay scallops are found at varying depths and salinities between 14–32 parts per thousand (ppt). Scallops thrive in areas that have healthy eelgrass and optimal water quality. Bay scallops are filter feeders and their primary food sources are phytoplankton and benthic diatoms.

Bay scallops are relatively short-lived, with an average longevity of 20–26 months. Because of the short life span of this species, only two age classes are typically represented in their populations (Fay, 1983). Scallops that do not bear a well-defined annual growth line are defined as seed scallops.

The bay scallop's biology directly influences the commercial fishing industry—specifically in terms of its spawning cycle, life span, development of a growth ring, and population size. Bay scallops (those approximately 12 months in age) typically spawn during the summer months when there is a rapid rise or fall in water temperature to around 20–22.2° C (Conant & Curley, 2005, 2). Scallops from a summer spawn grow through the summer and fall months, reaching a shell height of between 31–51 mm before the water temperature drops and their shell growth slows. Over the winter months, a ridge develops at the shell's edge. This ridge—referred to as a "growth ring"—suggests that the animal has lived through a winter.

Bay scallops are functional hermaphrodites where both gametes mature at the same time. During spawning events, eggs are released and fertilization occurs in the water column. After approximately 10–14 days as larvae drifting in the water column, the animal becomes a juvenile attaching onto a substrate—preferably a blade of eelgrass. They have also been found on alternative substrates such as seaweeds, filamentous algae, stones and debris.

Some bay scallops may also spawn in the fall, producing scallops that have a shortened growth period before the water temperature drops and shell growth ceases. These shellfish over-winter at 1–20 mm in size (Conant & Curley, 2005, 2), and develop a growth ring between 1– 20 mm from the hinge. These scallops are referred to as "nubs" or "ring at hinge" scallops.

In spite of all of the information available about the biology of this species, more research is needed to understand the reproductive capabilities of nubs. Specifically, there is debate as to whether or not an adult nub is able to over-winter and whether or not it can spawn twice. If it is found that nubs can spawn twice, that information may influence management decisions related to their harvest.

Threats/Stressors

One of the vexing problems of the bay scallop industry on Nantucket is the fluctuation in scallop populations from year to year. Given the short lifespan of these animals, their population levels rely on the successful reproduction of every year class. Successful reproduction depends on two factors—the first of which is a successful spawning that produces the larval supply. The second factor is recruitment, which relates to how many of these larvae survive and "set" as juveniles.

The relationship between spawning and recruitment can lead to a variety of outcomes. For example, a relatively small spawning stock can produce a strong year class when conditions for recruitment are favorable. The opposite can also be true, meaning a large spawning stock can produce a weak year class when unfavorable recruitment conditions exist. Landings data from year to year clearly illustrate this dynamic.

In order to have the best possible outcome for any given year class, environmental conditions must be favorable for both spawning and recruitment.

Though exact numbers are uncertain each year, the boom and bust cycle of the fishing industry shows scallop populations to be vulnerable to environmental changes such as the stress placed on the habitat. While the precise reason(s) for this fluctuation may be unknown, the general downward trend in bay scallop abundance in Nantucket waters (as indicated by annual landing reports) may be linked to a range of stressors including poor water quality, loss of habitat (e.g., decline in coverage and health of eelgrass), the over-harvest of nub scallops, predation by marine species, the loss of larvae on outgoing tides, harmful algal blooms, and various other factors. Ocean acidification is also a threat to bay scallops (Talmage & Gobler, 2010). It is probable that all of the aforementioned stressors individually play a role in the health of the bay scallop population. It is also possible that the cumulative impacts from various combinations of stressors may have additional impacts on populations in the Menemsha Pond Complex.

SECTION 6: HISTORY AND DESCRIPTION OF MENEMSHA POND SHELLFISHING

The Bay Scallop has always been an important resource for the Wampanoag Tribe, with many Tribal fishermen relying on the annual harvest to provide sustenance. The Martha's Vineyard natives presided near the coastal and inner coastal areas of the island where shellfish were readily accessible. Various shells, including scallop, recovered from the Vineyard's Native American population and dated with carbon measurements are believed to be from 2270 B.C. and 1565 A.D. Scallop has long been used by the Wampanoag Tribe for decorative and religious purposes (Mackenzie, 2008).

Recorded commercial bay scallop harvesting began in Massachusetts in 1874, which went along with the introduction of dredges. Initially, scallops were not embraced culinarily and were used for bait and chicken feed but their shells were known for a variety of colors and patterns (Mackenzie, 2008). The Menemsha Pond Complex's proximity to the working fishing village allowed the scallop fishery to grow along with the rest of the State, which would go on to produce more bay scallops than surrounding states. Scalloping has become significant to Martha's Vineyard community. Commercial harvesting is a sizable component for fishermen in the winter months and recreational harvesting provides additional sustenance for local families. It is seen as a Vineyard institution, many island families upholding the practices that originated in their own towns.

Commercial shellfish licenses may be issued to permanent residences of Aquinnah or Chilmark and may purchases an all species license, allowing collection of scallops, quahogs, oysters, soft-shelled clams and mussels or a single species license. All licenses are valid from April 1st to March 31st of the following year.

A shellfish license is required to take any and all types of shellfish from the waters of the Menemsha Pond Complex. Exempt from family/individual licensing by the town of Aquinnah is any person who is a member of the Wampanoag Tribe of Aquinnah, provided that while partaking in shellfishing, they are in possession of their tribal identification card. The exemption is not valid for any type of commercial shell fishing and any shellfish gathered may not be sold.

Separate shellfish regulations are delineated for the Chilmark and Aquinnah zones of the Menemsha Pond Complex (Appendix F). There is much overlap between the towns' regulations; shellfish license cost and length, allowable hours for commercial scalloping and specifications for acceptable dredging equipment are the same for both towns. Differing regulations include the daily limit for commercial quahog harvesting (four bushels in Chilmark and 8 in Aquinnah). In Chilmark, minors under the age of 16 cannot have a shellfish license while in Aquinnah; the minimum age is 14 years old.

Methods and Equipment

Shellfishing equipment has continually changed. Vessels such as rowboats and sail powered

boats eventually became powered by inboard and outboard motors towing dredges. Those too would eventually be brought onboard using power lifts. While fishermen still collect using rakes and other manually operated tools, dredging has been the primary method for commercial harvesting. Dredges or drags operate like a large net; metal or cloth mesh attaches to the frame, leaving an opening in the front to allow flow through.

No more than 6 dredges per boat may be used and dredges that have teeth, lead rollers and lead weights are prohibited. A dredge cannot be wider than 36 inches and the chain sweeps cannot be thicker than 0.5 inches. Boats used for commercial scalloping cannot exceed 22 feet in length.

Recreational scallopers are legally allowed to harvest scallops in any manner they choose as long as it does not involve a motor- or sail-powered boat or a dredge. While some people dive for bay scallops, many recreational fishermen use rakes to harvest their shellfish.

Scallop Seasons and Times

Menemsha Pond is open for commercial scalloping between 7:00 am to 4:00 pm Monday through Friday. All shellfishing is prohibited on Thanksgiving and Christmas. Scallop season opening and closing dates, as well as catch limits, are determined by Shellfish Committee recommendations and approval of the Board of Selectmen.

The air temperature must reach a minimum of 30 degrees Fahrenheit by no later than 10:00 am for dredging. If there are one or more days Monday through Friday where the minimum temperature is not reached, then dredging may occur on the Saturday of that week.

Catch and Size Limits

The daily limit for the taking of scallops are set by the town selectmen prior to opening the season annually or at any time during the season the selectmen may vote to change the daily limits.

The bay scallop has only two year classes, in comparison to oysters and quahogs, which mandate what is harvestable. Only adult scallops may be possessed, taken or sold. Legal adults are defined as having a well-defined, raised growth line at least 10 millimeters from the hinge of the shell. If the growth line is less than 10 millimeters from the hinge, the shell height must be at least 2.5 inches to be considered an adult.

Area and Season Closures

Town selectmen and shellfish constables are able to define an area where no shellfish harvest activity is allowed. These areas may be closed to create spawning or seed sanctuaries, habitat protection and to prevent overfishing. These closures are in response to a low population of adult scallops and/or large population of nub scallops. The town

selectmen and shellfish constables may decide to prohibit scalloping to ensure maturity of nub scallops and allow reproduction.

At any time, if water quality standards exceed federal standards for the presence of pathogenic bacteria areas impacted by harmful algal blooms, then all shellfishing can be prohibited. These closures are implemented by DMF and the MA Department of Public Health. The bay scallop is not often subject to these water-quality-based closures given that the only part generally consumed by humans is the adductor muscle, which does not typically accumulate pathogens.

Year	Aquinnah	Chilmark	Year	Aquinnah	Chilmark
2015		740	1990		
2014		2516	1989		0
2013	2814	822	1988		900
2012	4000	2272	1987		
2011		622	1986	2500	500
2010	1726	1765	1985		2613
2009		499	1984	2145	498
2008			1983	0	600
2007			1982	9830	214
2006		550	1981	4404	400
2005		640	1980	1540	164
2004		30	1979	834	
2003	889	8	1978	8642	2176
2002	392	4167	1977		93
2001	501	2	1976	4404	100
2000	0	0	1975		
1999	6044	0	1974		4728
1998	5072	8539	1973		49
1997	273	80	1972		478
1996	256	700	1971		2600
1995	0	40	1970		
1994		450	1969		1273
1993		0	1968		428
1992		360	1967		326
1991		1900	1966		815

Table 1: Bushels of scallops caught and reported in the Menemsha Pond Complex

SECTION 7: AQUACULTURE, PROPAGATION, AND SEED MANAGEMENT ACTIVITIES IN MENEMSHA POND

Aquinnah, Chilmark and the Tribe have engaged in propagation activities as a means to enhance the scallop populations of the Menemsha Pond Complex. Propagation activities have largely centered on growing small shellfish to a size sufficient to increase their likelihood of survival in the wild, and then releasing them into the pond. Bay scallop propagation has also involved the use of spawning cages to increase the potential for fertilization during the spawning process.

Aquinnah, Chilmark and the Tribe has been placing spawning stock in spawning cages prior to anticipated spawning events in order to increase the potential for fertilization. It is believed that placing scallops in close proximity during a spawning event will increase the likelihood that fertilization will take place. Spat bags (larval scallop collection bags) were deployed to the north of the spawning cages. This location for the spat bags was chosen due to its ideal collection aspect as a result of the tidal flow of the pond. Over the duration of the growth period, these bags were tended to in order to remove any bio-fouling that may reduce the flow of nutrients to the growing scallops.

In addition, scallop spat produced from the MVSG, further enhance the juvenile seed population (Table 2). Throughout the season, Aquinnah and Chilmark receive a share of the hatchery grown seed. Each allotment comes once every few days, depending on growth rate and resources available, and are attached to the inside of the spat bags and tied to the growout lines. The sealed bags are spaced out on the lines at approximately a foot apart which allows proper flow around the entire bag. As scallops drop off or swim from packets they will likely attach, by byssal threads, to the first thing they come into contact with. Spat spread out and attach to the inside of the spat bags and netron. They stay in place until ready to be moved to the next form of growout or they become overcrowded. Alternatively, the tribe purchases a set amount of scallop seed that are received at one time and set in spat bags and netron in the same fashion as the towns.

Year	Aquinnah	Chilmark	Tribe
2016	4,000,000	4,000,000	150,000
2015	3,500,000	3,500,000	150,000
2014	4,650,000	4,650,000	150,000
2013	4,027,000	4,027,000	150,000
2012	2,100,000	2,100,000	200,000
2011	4,000,000	4,000,000	150,000
2010	1,800,000	1,800,000	None
2009	2,000,000	2,000,000	None
2008	2,000,000	2,000,000	200,000
2007	1,500,000	3,000,000	200,000
2006	200,000	1,700,000	200,000
2005	1,700,000	1,700,000	200,000
2004	None	1,487,000	None
2003	632,000	632,000	None
2002	1,534,000	1,534,000	None
2001	2,013,000	2,013,000	None
2000	1,700,000	1,700,000	280,000
1999	1,382,000	1,382,000	367,000
1998	1,260,000	1,207,000	206,000

Table 2: Number of scallops distributed from MVSG

Growout and Deployment

To increase the survival of the scallop seed, spat bags attacked to growout lines house the scallops while they grow. In the weeks prior to receiving seed, spat bags are filled with a rigid form of netron, which keeps the bags from collapsing and gives more room for the scallops. The scallops' growth and spat bags densities are monitored and are spread to additional bags when they become overcrowded. When the scallops reach larger sizes where survival rate is stronger, they are released into the designated sanctuary. This temporary sanctuary is marked off by buoys and is restricted to both boat travel and shellfishing. Scallops released into the sanctuary which allows them to grow safely due to the cover of the eelgrass without interactions from winter fishermen further reducing mortality.

Figure 5: 1 acre area for scallop seed sanctuary

Predator Control

Predator traps are deployed by the Towns and the Tribe in the Menemsha Pond complex roughly 2 weeks before spawning events are estimated to occur. Traps are set up in several lines to the northeast of scallop spawning pens and scallop growth bags. Crabs are removed from the traps, counted and traps rebaited. The most frequent species found within the traps are often the green crab (*Carcinus maenas*) and the spider crab (*Libinia emarginata*). In 2015, Chilmark reported 27,100 and the Tribe reported over 6,000 crabs were caught and removed from the Menemsha Pond Complex (Town of Chilmark 2015, WTGHA Natural Resource Department, 2015).

SECTION 8: OTHER MARINE RESOURCE USES

Boat Slips, Docks and Moorings

The harbor has a total of 100 boat slips and 10 moorings. Transient slips and moorings cannot be booked in advance; before entering the harbor, the harbormaster must be contacted to advise on entering and availability. Moorings are also available east and west side of the harbor entrance. There are two rows on the east side and one row of moorings on the west side. All moorings must be removed annually by November 1st, to allow for shellfishing. The inner dock provides about 200 feet of side tie space. There is also a bulkhead north of the fuel docks at Dutcher Dock that provides transient dockage for visitors and unloading space for commercial fishermen and maximum length of boat 50 feet (Town

of Chilmark, 2008). The floating docks at Quitsa Pond Landing in Chilmark and West Basin in Aquinnah are for loading and unloading from moored boats and shellfish/harbormaster boats.

Water Activities

Other recreational water activities, such as swimming, snorkeling and boating (i.e. sailing, canoeing, kayaking) are allowed the Menemsha Pond component of the complex. Swimming, snorkeling and Scuba diving is prohibited in the channel and harbor without permission from the Harbormaster. Vessels traveling through the channel, harbor or mooring areas may not exceed headway or four knots, or which would cause wake. Water skiing and wind surfing is allowed in Menemsha Pond 300-500 feet from bathing areas, moored vessels and shellfish propagation floats. Personal watercraft or jet ski operation is only allowed in the channels to access the Vineyard Sound (Town of Chilmark, 2008).

SECTION 9: OTHER PROGRAMS RELATED TO SHELLFISH MANAGEMENT IN THE MENEMSHA POND COMPLEX

Channel Dredge

The U.S. Army Corps of Engineers have been leading an effort to dredge Menemsha channel. The decision came as a result of inadequate navigable conditions for boaters to take safe refuge in the event of dangerous weather conditions and the need to improve the flushing of the pond. By dredging the channel to a sufficient depth for boats to travel also would result in an increased tidal flow to the Menemsha Pond complex. The channel had not been dredged since the 1980's and very little environmental data exists surrounding the event.

In an effort to investigate the possible impacts/benefits that the dredging of the pond would create, the Natural Resources Department contracted the Woods Hole Group to create models of how the dredging would affect the hydrodynamics of the pond system. Areas of upmost concern focused on possible effects of shoaling, erosion, tidal flow, and risks to local shellfish populations. The report indicated that dredging would only cause minor changes to the pond's hydrodynamics and that any risk to local shellfish would be minimal. This environmental analysis was paid for in whole by the Tribe.

An increased tidal flow will most likely come with an increased level of nutrients entering and/or exiting the complex. With the monitoring program's adequate sample size to create a baseline, benefits or detriments associated with this project can be can be identified more easily under further study.

Oil Grit Separator

Catch Basins are underground holding systems designed to remove debris and sediment from stormwater runoff. They also serve as temporary spill containment units for hydrocarbon based compounds.

There are approximately 56 catch basins located on Tribal lands. The Tribe is responsible for the maintenance these catch basins on an annual basis. Over the last number of years, the Natural Resources Department has installed several hybrid catch basin systems along the roads within the Common Lands (Oil/Grit Separators). These underground storage tanks with three chambers designed to remove heavy particulates, floating debris and hydrocarbons from stormwater. Stormwater enters the first chamber where heavy sediments and solids drop out. The flow moves into the second chamber where oils and greases are removed and further settling of suspended solids takes place. Oil and grease are stored in this second chamber for future removal. After moving into the third outlet chamber, the clarified stormwater runoff is then discharged.

These systems have prevented 88 pounds of sediment hydrocarbons and 160 gallons of contaminated water from road run enter the surrounding waters and the Tribe's cranberry bogs.

SECTION 10: RECOMMENDATIONS

Habitat Management

Goal I: Maintain and improve the habitat associated with sustainable commercial and recreational shellfish fisheries

Objective I: Manage water quality to maintain or improve the habitat associated with sustainable shellfish fisheries

<u>Recommendations</u>

- Conduct and/or support research to better understand the hydrodynamics within the Menemsha Pond Complex and the impacts of water circulation on shellfish habitat and population dynamics.
- Support research activities, regulatory management changes, public education initiatives, capital improvements, and related fund-raising activities aimed at reducing nutrient inputs from anthropogenic sources.
- Conduct and/or support research to better understand the links between shellfish habitats, population dynamics, and anthropogenic activities that introduce chemicals into the Menemsha Pond Complex.
- Develop a better understanding of the sources and impacts of HABs on shellfish and their habitat.

- Conduct studies to investigate the role that environmental changes may have in altering shellfish populations in the Menemsha Pond Complex, including sea level rise, ocean acidification, and climate change.
- Explore options to reduce the financial cost currently associated with obtaining water quality results. Include a review of off-Island labs, for specialized analyses, including those offered by EPA.

Objective II: Maintain and, where possible, improve the condition and extent of eelgrass beds in the Menemsha Pond Complex

Recommendations

- Beginning with historical data compiled and maintained by the Massachusetts DEP, encourage continued monitoring of the extent and health of eelgrass in the Menemsha Pond Complex, and explore the relationships between eelgrass beds and other aquatic vegetation such as epiphytic growth, which can influence eelgrass health
- Undertake a review of practices that may directly damage eelgrass beds (e.g., moorings, scallop dredges, propeller damage, excess nutrient inputs from upland sources) to determine the short and long-term nature and significance of the impacts and explore methods to minimize those impacts.
- Develop and implement a cost-effective strategy to protect/restore eelgrass in locations of significance to shellfish resources
- Until a new strategy to protect eelgrass is in place, enforce existing mooring regulations and ensure that moorings are not located in productive shellfish beds
- Support research to better understand the relationship between eelgrass health and density and shading from various algal blooms, physical effects on eelgrass growth from overlying macroalgae
- Conduct research to better understand changes in sediment within the Menemsha Pond Complex

Objective III: Improve opportunities for shellfish recruitment into the fishery

Recommendations

- Catalog, map, and ground-truth information about the dominant habitat types (relative to shellfish survival) throughout the Menemsha Pond Complex.
- Continue to monitor dissolved oxygen in benthic areas of the Harbors, and expand monitoring to include monitoring of sediment acidity.
- Continue monitoring spat settlement throughout the Menemsha Pond Complex by way of spat collection and enumeration.
- Conduct collaborative annual surveys of juvenile shellfish stocks to assess the areas of spat fall to aid in management decision-making.

Objective IV: Understand the impacts of harvesting related activities on the habitat and the resources

Recommendations

- Conduct and/or support studies to determine the impacts of recreational and commercial shellfish harvesting (including the impacts of by-catch) on the sustainability of the resource and the habitat.
- Monitor and assess the overall intensity of shellfish harvest practices (including impacts stemming from by-catch) and manage activities within specific harvest areas to minimize the risk of detrimental impacts from excessive harvest practices.

Shellfish Resources

Goal I: Maintain and enhance the populations of Bay scallops in the Menemsha Pond Complex

Objective I: Enhance shellfish resources through propagation activities

Recommendations

- Develop and implement a strategy to track the effectiveness of propagation activities in terms of supplementing the commercial and recreational harvests. As part of this, identify locations best suited for larval release (e.g., areas with larval retention), examine the timing of larval release in terms of survival, and conduct post-set release and associated monitoring for survivability.
- Continue current propagation efforts and, based on the results of the study of propagation effectiveness, consider pursuing opportunities to expand propagation activities, including expansion to different species (i.e., oysters).

Objective II: Enhance shellfish resources through seed management activities

Recommendations

- Develop seed management protocols for transplanting seed.
- Develop and/or support studies to evaluate the efficacy of seed management activities
- Better understand impacts of wind-driven strandings on the bay scallop population.

Objective III: Enhance shellfish resources through spawning management

Recommendations

- Continue to develop spawning sanctuaries, through the use of spawning cages, to increase larval supply, and monitor impacts of sanctuaries
- Institute new steps—and continue existing efforts—to identify spawning events and monitor spat levels

Goal II: Conduct predator management activities

Objective I: Better understand the impacts of shellfish predators on the fishery and manage accordingly

Recommendations

- Measure and monitor predator abundance in the Menemsha Pond Complex (in part through a survey of bycatch)and measure impacts on shellfish resources during the various life stages for each species.

Goal III: Manage shellfish based on scientifically sound understanding of the shellfishes' lifecycles, population dynamics, and other biological traits.

Objective I: Develop a better scientific understanding of the Menemsha Pond Complex shellfish

Recommendations

- Conduct and/or support current and future research to better understand the spawning cycle of scallops, and specifically the spawning cycle of nub scallops.
- Better understand and define the biological traits of and stressors to bay scallops. Use that knowledge to make informed management decisions. Specific topics of interest include the relationship between spat recruitment and post-set spat survival as it relates to the overall abundance of shellfish, and the genetic variability among harvested shellfish

Regulations

Goal I: Structure commercial and recreational harvesting effort to protect shellfish resources.

Objective I: Ensure that commercial and recreational harvesting efforts provide for the sustainable maintenance of the shellfish resources

Recommendations

- Monitor the population characteristics of important shellfish resources across the Island, assessing recruitment into the fishery and the standing stock available for harvest, in order to provide information for management decisions
- Continue to limit the size and mechanics (power hoisting) of dredges and enforce existing restrictions such as the current 40-pound limit on the weight of the dredge.
- Work with other Massachusetts-based shellfishing communities and DMF to identify and conduct research designed to evaluate the definition of a legally harvestable bay scallop
- Increase oversight of recreational shellfishermen and enforcement of recreational regulations more widely

Goal II: Ensure adaptive management of shellfish resources

Objective I: Regulations need to be adaptive and responsive as new information and management strategies arise

Recommendations

- Implement the steps needed to institute the adaptive management section of this Plan. As a first step, the Town should establish a Shellfish Management Plan Implementation Committee. This Committee should be responsible for developing specific rules about adaptation

Goal III: Ensure sufficient resources to carry out the recommendations of this plan and management responsibilities under State and municipal laws and regulations

Objective I: To increase the revenue generated for shellfish management

Recommendations

- Develop alternative commercial and recreational permit fee structures to generate more revenue for the Menemsha Pond Complex

Management Implementation

Goal I: Administer and enforce the municipal Shellfish Management Plan in an efficient, consistent, equitable, and cost-effective manner

Objective I: Establish a stable independent budget for the Town's shellfish management activities

Recommendations

- Ensure stable funding for sufficient staffing of all management activities including research, water quality testing and analysis, propagation, enforcement and the use of interns and seasonal employees

Objective II: Continue to build on collaborative management and research, coordinating the activities and interests of the relevant Towns of Aquinnah and Chilmark and the Tribe boards and departments, commercial and recreational fishermen and associations, the Division of Marine Fisheries, and nonprofit organizations

Recommendations

- All personnel involved in management of shellfish resources and enforcement of shellfish regulations should attend periodic joint-training sessions (facilitated by fishermen and managers together) to ensure consistency of enforcement

- Work with other fishing communities in Massachusetts to identify and make recommendations to DMF in areas where changes might benefit Martha's Vineyard shellfisheries.
- Menemsha Pond research entities, along with the Towns and fishermen, should work together to further develop and implement the coordinated Research Plan associated with this Shellfish Management Plan

Objective III: Increase opportunities for successful commercial shellfish aquaculture in the Menemsha Pond Complex

Recommendations

- Continue to develop and implement an action plan to increase available space and use of space for aquaculture in the Menemsha Pond Complex
- Continue to work with DMF to identify and consider (1) potential aquaculture locations outside of the agency's usual physical sitting requirements and (2) approval of a block of sites in advance of the DMF's issuance of a license to an individual.

Objective IV: Manage areas of the Menemsha Pond Complex for harvest based on assessments of the resource, habitat conditions, and social demand

Recommendations

- Identify and make publically available areas for recreational fishing.
- Recreational fishing already dominates those shallow areas of the Menemsha Pond Complex most easily accessible to recreational fishermen. Information about those areas should be made available to recreational fishermen, though commercial fishing should not be excluded from those areas.

Education

Goal I: Increase public education/outreach efforts to the general public as well as recreational and commercial fishermen to create a better understanding of how human activities affect important shellfish resources

Objective I: Educate the general public about the significance of shellfishing to the Island's economy, culture, and history

Recommendations

- Design and implement a study to assess the economic impact of recreational and commercial shellfishing to the Menemsha Pond Complex.
- Develop and implement a public outreach strategy to highlight the significance of shellfishing both from a cultural and an economic perspective.
- Develop an oral history of commercial and recreational shellfishermen and those associated with the industry as part of the historical records.

Objective II: Educate the general public about the ways in which their actions affect the shellfishing industry

Recommendations

- Develop and implement an outreach strategy to educate the public about how land and water based activities can affect shellfish habitat.

Objective III: Provide education/outreach to recreational fishermen both as to how to improve their catch (within the limits of the management program) and to minimize impacts on habitat

Recommendations

- Provide information on "best fishing practices" for recreational fishermen, including tips on how to identify legally harvestable scallops, where to access the water, how to be safe while harvesting, and how to minimize impacts on the habitat. Improve outreach to let people know that recreational permits are required to harvest shellfish. Use the outreach opportunity as a way to improve community awareness of the issues facing the shellfisheries. Include information about how the money raised by license sales helps the fishery and the Island's economy.
- Improve access for recreational fishermen when feasible.
- Gather contact information from people when they purchase their recreational shellfish permits.

Objective IV: Provide opportunities to the commercial fishing fleet to participate in research projects and stock assessments, both as a means to gather high-quality information and to inform the fishing fleet as to on-going research efforts

Recommendations

- Investigate other Fishery Cooperative Research Programs in the region with the intention of developing and implementing a program in the Menemsha Pond Complex that will allow local fishermen to be involved in research and stock assessment efforts.
- Identify a select group of fishermen to assist with research by documenting bycatch details such as the percentage of seed and the types and abundance of predators.

Harvest Documentation

Accurate and comprehensive catch and effort data are critical to effective fisheries management. Daily catch data for bay scallops are gathered by shellfish wardens who check every catch every day—either on the water, at the docks, or at the shanties.

While some processes are in place to capture data about the commercial harvest of shellfish,

recreational shellfish catches are much more difficult to estimate due to the less visible and less predictable harvesting conducted by recreational fishermen.

Improved mechanisms to collect and/or verify commercial and recreational catch information, including details specific to different areas of the Harbors, will help to create a better record of the fisheries and will contribute to an improved understanding of legally harvestable species abundance and habitat issues.

Goal I: Manage based on accurate and complete data on the amount and location of shellfish harvested

Objective I: Improve methods of recording commercial and recreational shellfish landings to ensure a complete and accurate accounting of the harvest

Recommendations

- Continue to utilize records from shanties to help monitor and verify commercial landings. Additionally, continue to utilize records from shanties for enforcement of limits.
- Implement a means to track the general locations where shellfish were harvested—both recreationally and commercially.

Support of the Commercial Shellfishery

Goal I: Support the economic and physical structures of a viable shellfishery for both economic and traditional purposes

Objective I: Improve strategies to optimize the dollar value of harvested shellfish

Recommendations

- Develop marketing strategies, such as branding the Menemsha Pond scallop and/or controlling the rate at which scallops reach the market, to optimize the price of the Menemsha Pond bay scallop.
- Consider establishing a co-op for marketing purposes. As part of the development of this co-op, consider making participation optional, and look to other co-ops for examples of good strategies.
- Develop marketing strategies to enhance the value of the Menemsha Pond Complex shellfish by-products.
- Review options for timed fishing closures to ensure the quality and consistency of product reaching the market.
- Explore the apparent correlation between the price of scallops and number of buyers. Determine whether or not the number of buyers affects the price they are willing to pay.

Objective II: Improve training needed to maintain a viable shellfishery.

Recommendations

- Continue to enhance and implement a mentoring program to assist new entries into the fishery. As part of the enhancement, develop a check-list of topics for the teaching captain to cover with the apprentice. The checklist would include topics such as how to identify a legal bay scallop (to be taught by a Warden or shellfish biologist), how to cull a catch, a review of the regulations, and general etiquette at sea.

Adaptation of Plan

Goal I: The Shellfish Management Plan should respond to changing conditions in order to ensure that shellfish resources are not depleted below sustainable levels, thus ending the shellfish industry in Menemsha Pond.

Objective I: Shellfish management should be adaptive (i.e., can change from year to year or even during the season based on key pieces of information).

Recommendations

- Bring together a group of people (a "Shellfish Management Plan Implementation Committee") responsible for overseeing the implementation and adaptation of this Plan. This group should meet regularly and should include representatives from multiple stakeholder groups including recreational fishermen, commercial fishermen, SHAB, the Department of Natural Resources, scientists, and managers. Off-Island expertise should be included as appropriate. Three-year term limits should be established for this Committee. The group should work closely with not for- profit entities to help raise funds for management plan research and implementation activities, identify common data reporting/gathering techniques, prioritize research projects, and address other research-related issues.
- Establish a system whereby a review of coordinated threshold criteria (e.g., number of weather related fishing days lost, seed density, stock assessments, etc.) or a valid concern raised by a citizen would initiate a public process to address the issue(s)—including possible management actions.
- Review and revise the Shellfish Management Plan every three years.

SECTION 12: RESEARCH PLAN

Shellfish Resources

Goal I: Manage shellfish based on a scientifically sound understanding of the animals' lifecycles, population dynamics, and other biological traits.

1. Compile previous research focused on Menemsha shellfish resources.
    - Collect previous Nantucket shellfish research documents, data sets, metadata, and any other research deemed important to furthering the understanding of shellfish resources on the Island. This information should be available electronically, and a hard-copy should be maintained in the Town Archives.
    - Management Implications: This management planning effort identified several important sources of information pertaining to the management of shellfish. These documents provide important scientific and historical insight, and may prove useful as new management issues arise.

2. Define the biological traits and life history characteristics of bay scallops
    - Describe the spawning cycle of bay scallops on Martha's Vineyard and how environmental conditions may affect overall spawning effort.
    - Explain the spawning cycle and contribution of nub scallops to the overall population of bay scallops.
    - Conduct investigations into biology of other species as need arises.

Management Implications: The details of the bay scallops' spawning cycle, including the impact of environmental conditions on spawning effort will provide insight into causes for population fluctuations, and may help better predict the quality of the season before it begins. Having some insight as to what an upcoming season may look like can inform early planning in terms of the management strategies that would be most appropriate (e.g., extending or shortening the season). Additionally, if conclusions can be drawn to support a thickness gauge for identifying legally harvestable bay scallops, management might be changed to reflect a thickness rule rather than a growth ring and shell height rule.

Understanding the nub scallop's spawning cycle and its contribution to the population would help to clarify whether or not there is value in leaving nubs in the water and is critical to bay scallop management

3. Assess the populations of harvested shellfish resources.
    - Monitor the population characteristics of shellfish resources across the Island, assessing recruitment into the fishery and the standing stock, with a goal of defining the resource available for harvest. This could be done in a collaborative manner by working with local fishermen to assist in stock assessments.

- Investigate the interrelationship between spat recruitment and post-set spat survival as it relates to the overall abundance of harvestable bay scallop stock.
- Develop a population model with predictive capacity for bay scallop populations in Menemsha Pond Complex waters. Ground truth with data from the stock assessment suggested above.
- Investigate the genetic variability among harvested shellfish.
- Determine how enhancement activities have affected the bay scallop population in different areas of the Menemsha Pond Complex.
- Investigate the impacts of propagation activities.

Management Implications: Better understanding of population characteristics, including the impacts of spat survival on population abundance may help better predict the quality of the season before it begins. Having some insight as to what an upcoming season may look like can inform early planning in terms of the management strategies that would be most appropriate (e.g., extending or shortening the season).

4. Recognize the role that various environmental stressors may play in altering the ecosystem to an extent that affects shellfish resources, including the bay scallop.
    - Excess nutrient run-off from all potential sources,
    - Local application of pesticides, fungicides and other toxins used in upland management activities, and
    - Marine-based toxicants, such as antifouling paints and chemicals used for maintenance of boats.

Management Implications: Understanding the impacts of chemicals and nutrients from upland and water-based sources will help target efforts to reduce those chemicals with significant impacts on Nantucket's shellfish and their supporting habitats.

Goal II: Maintain and enhance the populations of scallops in Menemsha Pond.

1. Improve shellfish resources through enhanced spawning management
    - Continue to utilize and evaluate spawning sanctuaries to increase larval supply and monitor their impacts.
    - Identify annual shellfish spawning events

2. Improve shellfish resources through post-set release of bay scallops
    - Understand the impacts of post-set release, including predation, survivability, and effectiveness of various substrate-types.

Management Implications: Spawning management is a significant part of the Tribe and towns' strategy to maintain sustainable shellfish populations. Understanding the impacts of existing spawning management efforts, and finding ways to improve those efforts will help to direct future spawning management activities so that they are most cost-effective.

3. Improve opportunities for shellfish recruitment into the fishery
    - Catalog, map, and ground-truth information about the dominant habitat types (relative to shellfish survival) throughout Menemsha Pond Complex.
    - Research the potential for using natural or artificial substrates
    - Conduct collaborative annual surveys of juvenile shellfish stocks to assess the areas of spatfall.

Management Implications: By developing baseline data about the traits, trends, and locations of habitats significant to shellfish, efforts can be made to monitor the condition and extent of those habitats over time. This information will help identify where habitat protection strategies are needed and where artificial habitat might be appropriate. Additionally, information about habitat changes could provide insight into the quality of future seasons, and could influence preseason management activities.

4. Evaluate new methods for shellfish propagation in local waters
    - Evaluate the current propagation activities involving the shellfish hatchery post-set seed production
    - Identify locations and times best suited for specific propagation-related technologies/activities, such as competent larval release, based on water quality, habitat value, larval distribution/retention, and growth/survival.

Management Implications: Propagation is a significant part of the strategy to maintain sustainable shellfish populations. By identifying ways to increase the effectiveness of propagation activities (e.g.: best technologies, significance of water quality conditions, etc.), future propagation activities can be more cost effective.

5. Enhance shellfish resources through seed management activities
    - Develop and test handling protocols for transplanting seed, including stranded seed from a weather event as well as seed relayed from areas of exceedingly high densities.
    - Evaluate and establish criteria for siting seed sanctuaries based on water quality, habitat value, and seed survival/growth.
    - Investigate the role that fishing practices may play in relocating seed during harvest culling activities.

Management Implications: Many of the current bay scallop seed management activities are conducted based upon the general expectation that efforts to relay and transplant seed and to create seed sanctuaries will benefit the overall bay scallop population. However, developing a scientifically-based understanding of how best to manage seed (e.g., through transplants, culling activities, and seed sanctuaries) will ensure that protocols for such seed management activities are successful.

Goal III: Conduct predator management activities

1. Evaluate the impacts of predators on shellfish resources during the various life stages for harvested species
    - Measure and monitor pest/nuisance and predator abundance in local waters
    - Assess predator impacts
    - Implement a predator management protocol as appropriate, perhaps based on the identification of an "over-abundance" (which would need to be defined) of predators in the ecosystem.

Management Implications: An improved understanding of predators and their impacts on Menemsha Pond Complex shellfish resources can inform a predator management strategy to relieve that particular stressor to shellfish populations

Habitat Management

Goal I: Maintain and improve the habitat associated with sustainable commercial and recreational shellfish fisheries

1. Investigate the role of water circulation patterns on shellfish distribution, recruitment, growth, and survival
    - Better understand the overall hydrodynamics within the Menemsha Pond Complex
    - Investigate the role of freshwater intrusion/inputs on scallop population dynamics

Management Implications: Understanding the role of water circulation patterns on shellfish populations will help identify specific management activities to best reduce related stressors to shellfish.

2. Better understand the links between water quality, shellfish population dynamics, and anthropogenic activities that influence the Menemsha Pond Complex.

    - Understanding the impacts of applying fertilizers, herbicides, and pesticides on upland areas. This would entail:
        - gathering details about the chemicals being used, the quantities being applied,
        - and the associated impacts and obtaining information about the condition septic systems
    - Researching the impacts of discharging grey water from vessels (and the related No Discharge Area designation)
    - Evaluate methods for reducing nutrient inputs to local waters from anthropogenic sources.
    - Understanding the impacts of boat maintenance activities such as boat washing and bottom painting as well as the overall impacts of boat activity in

local waters, including petroleum hydrocarbon discharges and effects of propeller shear stress on larval survival.

Management Implications: Understanding the impacts of chemicals and nutrients from upland and water-based sources will help target efforts to reduce those chemicals with significant impacts on shellfish and their supporting habitats.

3. Develop a better understanding of the sources and impacts of Harmful Algal Blooms (HABs) on shellfish and their habitat
    - Identify sources of and track potentially harmful blooms in local waters.
    - Investigate toxicities of new HAB occurrences to all shellfish resources.

Management Implications: Understanding the causes of HABs can help direct efforts to reduce those causes, and thus the occurrence of HABs. Tracking the impacts of HABs that do take place can suggest important information about the potential quality of the following shellfish season and can inform early planning in terms of the management strategies that would be most appropriate (e.g., extending or shortening the season)

4. Maintain and, where possible, improve the condition and extent of eelgrass beds in Vineyard waters
    - Beginning with historical data compiled and maintained by the Massachusetts DEP, continue monitoring and evaluating the extent and health of eelgrass in the Menemsha Pond Complex.
    - Better understand the relationship between eelgrass health and the following;
        - surface density and shading from algal blooms or physical structures over the water
        - physical effects on eelgrass growth from overlying
        - effects to eelgrass from nuisance epiphytes growing directly on eelgrass
    - Undertake a review of practices that may directly damage eelgrass beds to determine the short- and long-term nature and significance of the impacts
    - Evaluate the progress of modifying moorings in Nantucket Harbor to minimize damage to surrounding eelgrass beds.
    - Evaluate cost-effective strategies to protect/restore eelgrass in locations of significance to shellfish resources—both within and outside the Menemsha Pond Complex.
    - Survey sediment within the Harbors to update and/or verify data sets with a focus on sediment types where eelgrass has been lost.

Management Implications: Understanding the condition and extent of eelgrass and the stressors to eelgrass condition and extent can inform eelgrass restoration and protection activities. Additionally, monitoring can show trends in eelgrass habitat condition and extent, which may indicate the quality of the following shellfish season and lead to early planning in terms of the management strategies that would be most appropriate (e.g., altering gear

used).

5. Understand the impacts of harvesting-related activities on the habitat and the resources
    - Determine the impacts of recreational and commercial shellfish harvesting practices on the sustainability of the resource and the habitat.
    - Develop and/or promote more "habitat-friendly" shellfish harvest tools and methods, which would include the development of a "best practices" for commercial shellfish harvesting to incorporate into the apprenticeship program and promote among the fleet.

Management Implications: Understanding the impacts of shellfish harvesting may lead to changes in management strategies including such harvesting practices as gear restrictions and fishing locations.

Climate Change

Goal I: To ensure that the management of shellfish resources in the Menemsha Pond Complex are prepared to adapt as our knowledge of the potential impacts of climate change develop.

1. Develop a better scientific understanding of the impact that global climate change and associated changes in the environment will have on shellfish resources and how to adapt to those projected changes.
    - Enhance efforts to record water temperature, changes in pH, and/or other details, such as when the harbors freeze over
    - Determine the role of freshwater inputs on scallop population dynamics
    - Investigate the role that environmental change may have in altering shellfish populations in the Menemsha Pond Complex, including sea level rise, ocean acidification, and climate change.
    - Evaluate the impacts of returning shell to the Harbors in terms of the ability to buffer pH levels.

Management Implications: Understanding the impacts of climate change on shellfish populations will provide important information about the future of the fishery, and may influence the importance of management actions such as propagation activities and pH buffering.

Support of the Commercial/Recreational Shellfishery

Goal I: Support structure of a viable shellfishery for both economic and traditional purposes.

1. Understand the role of shellfish harvests to the economy and culture of Menemsha Pond

- Assess the economic impact of recreational and commercial shellfisheries in the Menemsha Pond Complex, including:
    - Employment rates (including jobs both directly and indirectly affected by shellfishing) and wages,
    - impact to other sectors of the economy,
    - Cash-flow through the Island economy,
    - Economic trends related to shellfishing.

Management Implications: A better understanding of the economic significance of shellfishing can help elevate its significance among researchers, funders, and the general public. Such increased attention may lead to the acquisition of new knowledge, the increased general will to protect the natural resources related to shellfishing, and the influx of financial resources to study and manage the shellfisheries.

Goal II: Enhance the economic return derived from harvest of shellfish in the Menemsha Pond Complex

1. Improve strategies to optimize the dollar value of harvested shellfish
    - Research the potential of marketing strategies, such as branding the Nantucket bay scallop and/or controlling the rate at which scallops reach the market, to optimize the price of the Menemsha Pond bay scallop.
    - Research the effectiveness of using a sticker to identify all containers of scallops as coming from the Menemsha Pond Complex.
    - Research the potential for and effectiveness of establishing quality standards (such as a freshness standard) that would be universally agreed upon and promoted by all who handle Menemsha Pond bay scallops.
    - Research opportunities to link recreational shellfish harvesting to other aspects of ecotourism when promoting Chilmark and Aquinnah as destinations.
    - Review options for timed fishing closures to ensure the quality and consistency of product reaching the market, and the impact on price due to change in supply.
    - Evaluate establishing a co-op for marketing purposes.
    - Investigate the use and commercial value of by-products from the Menemsha Pond Complex shellfishery.

Management Implications: Understanding how to optimize the dollar value of harvestable shellfish will lead to such management actions as branding the Menemsha Pond Complex bay scallop, using timed closures to increase the price of shellfish, developing a co-operative of fishermen, and developing/refining guidelines for the use of shellfish by-products.

Education

Goal I: Increase public education/outreach efforts to create a better understanding of how

human activities affect important shellfish resources

1. Investigate ways to effectively educate the general public about the significance of shellfishing to the Island's economy, culture, and history
    - An oral history of commercial and recreational shellfishermen and those associated with the industry as part of the historical records of the Island.
    - Collaboration to build off of other educational efforts (past and present).
    - A research project designed to determine the direct and induced economic significance of commercial and recreational shellfishing in the Menemsha Pond Complex.
    - Alternative yard maintenance options.
    - A review of the capabilities of conservation moorings
    - A program about the relationship between spawning biomass, larval supply, and post-set recruitment.
    - A mobile display conveying the significance of shellfishing in the Menemsha Pond Complex.

Management Implications: An improved understanding of how best to reach out to the general public (e.g., how to work with existing education efforts, how to make shellfishing significant to the general public, and how to inspire environmentally responsible behavior with regard to impacts on shellfish) may lead to efforts to minimize anthropogenic impacts such as septic maintenance, impervious surface reduction, and yard care practices.

Collaborative Research

Given the specific need to improve scientific understanding in a way that will inform management strategies, a collaborative should be developed to facilitate conversations dedicated to the research needs and opportunities identified in this Plan and those that arise as a result of new information and/or the passage of time.

Specific objectives of the Research Collaborative might include:

- Coordinate research proposals and programs so that all relevant partners are involved.
- Share data, methods, experiences, etc., to improve the planning and execution of research.
- Ensure that new projects build upon past projects and integrate with ongoing projects. For example, a habitat restoration proposal by one partner should take advantage of long-term monitoring by another.
- Collectively update and re-prioritize research needs on an on-going basis, giving specific attention to how research projects address management issues.
- Grow the total pool of research funds by demonstrating diverse partnerships and accessing unique sources.
- Provide a vehicle for introducing off-island experiences, expertise and collaborations into local research and management.

- Engage fishermen in specific, approved research programs that directly address information needs identified by the Research Collaborative. Incentives for fishermen's participation could be economic, either by allowing extra fishing days or bag limits or directly compensating the fishermen for their efforts. (This strategy has proven to be highly successful for the off-shore scallop fishery where new innovations in gear technology have been developed through collaborative efforts among fishermen, scientists and engineers that are supported in part by enhanced fishing opportunities parlayed to participating fishermen.)

Application of Information to Shellfish Management

As new information is generated and routine information is better appreciated, the conversion of information to management techniques requires interpretation and application of the information.
Assuming that (1) shellfish research specific to Menemsha Pond Complex shellfish will increase, and (2) that catch reporting information will become more reliable and more accessible.

The data-limited nature of the Menemsha Pond Complex shellfishery does not allow application of traditional stock assessment models that estimate biological reference points and stock status relative to those reference points. Even if the fishery was more data-rich, the life history and ecology of local shellfish, such as the bay scallop, are likely not amenable to traditional stock assessment methods. However, the potential for any species, even bay scallops, to reach dangerously low levels that threaten economic, ecological or even outright biological extinction calls for some means of gauging the health and trends of the stock and, therefore, consideration of approaches other than traditional stock assessment models.

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APPENDIX A: MATRIX OF RECOMMENDATIONS

The matrix of recommendations is a summary of the recommendations contained in the body of this plan. Addressing any of the recommendations outlined in this matrix will improve the understanding and management of the Menemsha Pond Complex bay scallop fishery. Opportunities or interest in addressing any of these recommendations will benefit the Menemsha Pond Complex bay scallop fishery. The ranking of some recommendations as "high" does not mean that, if the opportunity arises, other recommendations (ranked either "medium" or "low") should not be pursued.

The capacity to address more recommendations and to do so more effectively will be enhanced by the creation of the Menemsha Research Collaborative, which will facilitate pooling resources, integrating projects, and increasing the range of outputs.

The Shellfish Management Plan Committee also felt that evaluation criteria (to be developed by the Shellfish Management Plan Implementation Committee) may be useful in helping to determine some metrics to assess whether or not each recommendation has successfully been implemented - and to what effect. Accordingly, the matrix includes a place-holder column for evaluation criteria.

		Objective	Recommendation #	Recommendation	Implementing Agencies/Groups	Priority	Evaluation Criteria
Habitat Management	**Goal I: Maintain and improve the habitat associated with sustainable commercial and recreational shellfish fisheries**	**Objective I: Manage water quality to maintain or improve the habitat associated with sustainable shellfish fisheries**	**Recommendation 1**	Conduct and/or support research to better understand the hydrodynamics within the Menemsha Pond Complex and the impacts of water circulation on shellfish habitat and population dynamics. With better information on water circulation and its impacts, options for improving circulation could be considered and implemented as appropriate.	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah) • Department of Marine and Coastal Resources • Outside experts as appropriate	Med	
			Recommendation 2	Support research activities, regulatory management changes, public education initiatives, capital improvements, and related fund-raising activities aimed at reducing nutrient inputs from anthropogenic sources.	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah) • Department of Marine and Coastal Resources • Town Shellfish Committees • Martha's Vineyard Shellfish Group, Inc. • Outside experts as appropriate	High	
			Recommendation 3	Conduct and/or support research to better understand the links between shellfish habitats, population dynamics, and anthropogenic activities that introduce chemicals into Menemsha waters. Examples of activities of interest include: the application of fertilizers, herbicides, and pesticides on upland areas (including details about the chemicals being used, the quantities being applied, and the associated impacts); the use of septic systems; the discharge of grey water from vessels (and the related No Discharge Area designation); the discharge of petroleum hydrocarbon; and boat maintenance activities such as boat washing and bottom painting.	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah) • Department of Marine and Coastal Resources • Town Shellfish Committees • Martha's Vineyard Shellfish Group, Inc. • Martha's Vineyard Commission • Outside experts as appropriate	High	

		Recommendation 4	Develop a better understanding of the sources and impacts of HABs on shellfish and their habitat. Support or conduct research to address identifying and tracking potentially harmful blooms in local waters.	• Menemsha Research Collaborative* •Wampanoag Tribe of Gay Head (Aquinnah)Natural Resources Department • Department of Marine and Coastal Resources • Martha's Vineyard Shellfish Group, Inc. • Martha's Vineyard Commission • Outside experts as appropriate	High	
		Recommendation 5	Conduct and/or support studies to investigate the role that environmental changes may have in altering shellfish populations in the Menemsha Pons Complex, including sea level rise, ocean acidification, and climate change. As part of this, continue, and where appropriate, enhance efforts to record water temperature, changes in pH, and details about when the ponds and harbor freezes over.	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah) • Department of Marine and Coastal Resources • Outside experts as appropriate	Med	
	Objective II: Maintain and, where possible, improve the condition and extent of eelgrass beds in the Menemsha Pond Complex	**Recommendation 1**	Beginning with historical data compiled and maintained by the Massachusetts DEP, encourage continued monitoring of the extent and health of eelgrass in the Menemsha Pond Complex, and explore the relationships between eelgrass beds and other aquatic vegetation such as epiphytic growth, which can influence eelgrass health. To the extent possible, connect with regional eelgrass mapping exercises.	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah) • Department of Marine and Coastal Resources • US EPA • Outside experts as appropriate	Med	

		Recommendation 2	Undertake a review of practices that may directly damage eelgrass beds (e.g., moorings, scallop dredges, propeller damage, excess nutrient inputs from upland sources) to determine the short and long-term nature and significance of the impacts and explore methods to minimize those impacts.	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah) • Department of Marine and Coastal Resources • US EPA • Outside experts as appropriate	High	
		Recommendation 3	Develop and implement a cost-effective strategy to protect/restore eelgrass in locations of significance to shellfish resources	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah) • US EPA • Outside experts as appropriate	Med	
		Recommendation 4	Until a new strategy to protect eelgrass is in place, enforce existing mooring regulations and ensure that moorings are not located in productive shellfish beds	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah)	Med	
		Recommendation 5	Support research to better understand the relationship between eelgrass health and density and shading from various algal blooms, physical effects on eelgrass growth from overlying macroalgae	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah)	Low	
		Recommendation 6	Conduct research to better understand changes in sediment within the harbor since the most recent data were gathered	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah)	Low	
	Objective III: Improve opportunities for shellfish recruitment into the fishery	**Recommendation 1**	Catalog, map, and ground-truth information about the dominant habitat types (relative to shellfish survival) throughout Menemsha Pond. Use this information as baseline data and as a basis for prioritizing and protecting shellfish habitat and promoting an awareness of the need for managing habitat as an important element in managing the shellfishery.	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah) • US EPA • Outside experts as appropriate	Med	

			Recommendation 2	Continue to monitor dissolved oxygen in benthic areas of the Harbors, and expand monitoring to include monitoring of sediment acidity.	• Menemsha Research Collaborative* •Wampanoag Tribe of Gay Head (Aquinnah)Natural Resources Department	Med	
			Recommendation 3	Continue monitoring spat settlement throughout the Menemsha Pond Complex by way of spat collection and enumeration.	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah)	Med	
			Recommendation 4	Conduct collaborative annual surveys of juvenile shellfish stocks to assess the areas of spat fall to aid in management decision-making.	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah)	Med	
		Objective IV: Understand the impacts of harvesting related activities on the habitat and the resources	**Recommendation 1**	Conduct and/or support studies to determine the impacts of recreational and commercial shellfish harvesting (including the impacts of by-catch) on the sustainability of the resource and the habitat.	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah) • US EPA • Outside experts as appropriate	Low	
			Recommendation 2	Monitor and assess the overall intensity of shellfish harvest practices (including impacts stemming from by-catch) and manage activities within specific harvest areas to minimize the risk of detrimental impacts from excessive harvest practices.	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah) • US EPA • Outside experts as appropriate	Med	
Shellfish Resources	**Goal II: Conduct predator management activities**	**Objective I: Enhance shellfish resources through propagation activities**	**Recommendation 1**	Develop and implement a strategy to track the effectiveness of propagation activities in terms of supplementing the commercial and recreational harvests. As part of this, identify locations best suited for larval release (e.g., areas with larval retention), examine the timing of larval release in terms of survival, and conduct post-set release and associated monitoring for survivability.	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah)	High	

			Recommendation 2	Continue current propagation efforts such as the larval release program and, based on the results of the study of propagation effectiveness, consider pursuing opportunities to expand propagation activities, including expansion to different species (i.e., oysters).	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah)	High	
		Objective II: Enhance shellfish resources through seed management activities	**Recommendation 1**	Develop seed management protocols for transplanting seed. Outline criteria for establishing seed sanctuaries. Review the effects of the protocols and adapt as appropriate.	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah)	High	
			Recommendation 2	Develop and/or support studies to evaluate the efficacy of seed management activities. Adjust seed programs to improve effectiveness.	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah)	Med	
			Recommendation 3	Better understand impacts of wind-driven strandings on the bay scallop population. Topics of interest include survivability of seed returned to the water and the effects on the seed population (i.e., what percent of seed is stranded).	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah) • US EPA • Outside experts as appropriate	Med	
		Objective III: Enhance shellfish resources through spawning management	**Recommendation 1**	Continue to develop spawning sanctuaries, through the use of spawning cages, to increase larval supply, and monitor impacts of sanctuaries	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah)	High	
			Recommendation 2	Institute new steps—and continue existing efforts—to identify spawning events and monitor spat levels	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah)	Med	

	Goal II: Conduct predator management activities	**Objective I: Better understand the impacts of shellfish predators on the fishery and manage accordingly**	**Recommendation 1**	Measure and monitor predator abundance in the Menemsha Pond Complex (in part through a survey of bycatch)and measure impacts on shellfish resources during the various life stages for each species.	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah) • Shellfishermen • Outside experts as appropriate	Low	
	Goal III: Manage shellfish based on scientifically sound understanding of the shellfishes' lifecycles, population dynamics, and other biological traits.	**Objective I: Develop a better scientific understanding of the Menemsha Pond Complex shellfish**	**Recommendation 1**	Conduct and/or support current and future research to better understand the spawning cycle of scallops, and specifically the spawning cycle of nub scallops.	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah) • Shellfishermen • Outside experts as appropriate	Med	
			Recommendation 2	Better understand and define the biological traits of and stressors to bay scallops. Use that knowledge to make informed management decisions. Specific topics of interest include the relationship between spat recruitment and post-set spat survival as it relates to the overall abundance of shellfish, and the genetic variability among harvested shellfish	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah) • Shellfishermen • Outside experts as appropriate	Med	
Regulations	**Goal I: Structure commercial and recreational harvesting effort to protect shellfish resources.**	**Objective I: Ensure that commercial and recreational harvesting efforts provide for the sustainable maintenance of the shellfish resources**	**Recommendation 1**	Conduct and/or support current and future research to better understand the spawning cycle of scallops, and specifically the spawning cycle of nub scallops.	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah) • Shellfishermen	Med	
			Recommendation 2	Continue to limit the size and mechanics (power hoisting) of dredges and enforce existing restrictions such as the current 40-pound limit on the weight of the dredge.	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah) • Selectboards	Med	

		Recommendation 3	Work with other Massachusetts-based shellfishing communities and DMF to identify and conduct research designed to evaluate the definition of a legally harvestable bay scallop.	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah) • Selectboards	Med	
		Recommendation 4	Increase oversight of recreational shellfishermen and enforcement of recreational regulations more widely	•Towns of Aquinnah, Chilmark Shellfish Departments and/or the Wampanoag Tribe of Gay Head (Aquinnah) NRD	Med	
Goal III: Ensure sufficient resources to carry out the recommendations of this plan and management responsibilities under State and municipal laws and regulations	**Objective I: To increase the revenue generated for shellfish management**	**Recommendation 1**	Implement the steps needed to institute the adaptive management section of this Plan. As a first step, the Town should establish a Shellfish Management Plan Implementation Committee. This Committee should be responsible for developing specific rules about adaptation	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah) • Selectboards	High	
Goal II: Ensure adaptive management of shellfish resources	**Objective I: Regulations need to be adaptive and responsive as new information and management strategies arise**	**Recommendation 1**	Develop alternative commercial and recreational permit fee structures to generate more revenue for the Menemsha Pond Complex	•Towns of Aquinnah, Chilmark Shellfish Departments and/or the Wampanoag Tribe of Gay Head (Aquinnah) NRD	Low	

Management Implementation	**Goal I: Administer and enforce the municipal Shellfish Management Plan in an efficient, consistent, equitable, and cost-effective manner**	**Objective I: Establish a stable independent budget for the Town's shellfish management activities**	**Recommendation 1**	Ensure stable funding for sufficient staffing of all management activities including research, water quality testing and analysis, propagation, enforcement and the use of interns and seasonal employees	•Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah) Natural Resources Department • Selectboards	High	
		Objective II: Continue to build on collaborative management and research, coordinating the activities and interests of the relevant Towns of Aquinnah and Chilmark and the Tribe boards and departments, commercial and recreational fishermen and associations, the Division of Marine Fisheries, and nonprofit organizations	**Recommendation 1**	All personnel involved in management of shellfish resources and enforcement of shellfish regulations should attend periodic joint-training sessions (facilitated by fishermen and managers together) to ensure consistency of enforcement	•Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah) Natural Resources Department • Selectboards	High	
			Recommendation 2	Work with other fishing communities in Massachusetts to identify and make recommendations to DMF in areas where changes might benefit Martha's Vineyard shellfisheries.	•Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah) Natural Resources Department • Selectboards	Med	
			Recommendation 3	Menemsha Pond research entities, along with the Towns and fishermen, should work together to further develop and implement the coordinated Research Plan associated with this Shellfish Management Plan	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah) • Shellfishermen • Outside experts as appropriate	Med	
		Objective III: Increase opportunities for successful commercial shellfish aquaculture in the Menemsha Pond Complex	**Recommendation 1**	Continue to develop and implement an action plan to increase available space and use of space for aquaculture in the Menemsha Pond Complex	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah) • Shellfishermen	Med	
			Recommendation 2	Continue to work with DMF to identify and consider (1) potential aquaculture locations outside of the agency's usual physical sitting requirements and (2) approval of a block of sites in advance of the DMF's issuance of a license to an individual.	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah) • MA Division of Marine Fisheries • Shellfishermen	Med	

		Objective IV: Manage areas of the Menemsha Pond Complex for harvest based on assessments of the resource, habitat conditions, and social demand	**Recommendation 1**	Identify and make publically available areas for recreational fishing. Recreational fishing already dominates those shallow areas of the Menemsha Pond Complex most easily accessible to recreational fishermen. Information about those areas should be made available to recreational fishers, though commercial fishing should not be excluded from those areas.	• Menemsha Research Collaborative* •Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah) • MA Division of Marine Fisheries	Med	
Education	**Goal I: Increase public education/outreach efforts to the general public as well as recreational and commercial fishermen to create a better understanding of how human activities affect important shellfish resources**	**Objective I: Educate the general public about the significance of shellfishing to the Island's economy, culture, and history**	**Recommendation 1**	Design and implement a study to assess the economic impact of recreational and commercial shellfishing to the Menemsha Pond Complex.	• Menemsha Research Collaborative* • Wampanoag Tribe of Gay Head (Aquinnah) Natural Resources Department • Town Shellfish Committees • Martha's Vineyard Shellfish Group, Inc. • Martha's Vineyard Commission • Outside experts as appropriate	Med	
			Recommendation 2	Develop and implement a public outreach strategy to highlight the significance of shellfishing both from a cultural and an economic perspective.	• Menemsha Research Collaborative* • Wampanoag Tribe of Gay Head (Aquinnah) Natural Resources Department • Town Shellfish Committees • Martha's Vineyard Shellfish Group, Inc.	High	
			Recommendation 3	Develop an oral history of commercial and recreational shellfishermen and those associated with the industry as part of the historical records.	• Menemsha Research Collaborative* • Martha's Vineyard Historical Society • Martha's Vineyard Fishermen's Preservation Trust	Low	

		Objective II: Educate the general public about the ways in which their actions affect the shellfishing industry	**Recommendation 1**	Develop and implement an outreach strategy to educate the public about how land and water based activities can affect shellfish habitat.	• Menemsha Research Collaborative* • Wampanoag Tribe of Gay Head (Aquinnah) Natural Resources Department • Town Selectboards • Town Shellfish Committees • Martha's Vineyard Shellfish Group, Inc. • Martha's Vineyard Commission	High	
		Objective III: Provide education/outreach to recreational fishermen both as to how to improve their catch (within the limits of the management program) and to minimize impacts on habitat	**Recommendation 1**	Provide information on "best fishing practices" for recreational fishermen, including tips on how to identify legally harvestable scallops, where to access the water, how to be safe while harvesting, and how to minimize impacts on the habitat. Improve outreach to let people know that recreational permits are required to harvest shellfish. Use the outreach opportunity as a way to improve community awareness of the issues facing the shellfisheries. Include information about how the money raised by license sales helps the fishery and the Island's economy.	• Menemsha Research Collaborative* • Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah) Natural Resources Department • Martha's Vineyard Shellfish Group, Inc. • Martha's Vineyard Commission • MA Division of Marine Fisheries • Martha's Vineyard Fishermen's Preservation Trust	High	
			Recommendation 2	Improve access for recreational fishermen when feasible.	• Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah) Natural Resources Department • MA Division of Marine Fisheries	Low	
			Recommendation 3	Gather contact information from people when they purchase their recreational shellfish permits.	• Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah) Natural Resources Department	Low	

		Objective IV: Provide opportunities to the commercial fishing fleet to participate in research projects and stock assessments, both as a means to gather high-quality information and to inform the fishing fleet as to on-going research efforts	**Recommendation 1**	Investigate other Fishery Cooperative Research Programs in the region with the intention of developing and implementing a program in the Menemsha Pond Complex that will allow local fishermen to be involved in research and stock assessment efforts.	• Menemsha Research Collaborative* • Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah) Natural Resources Department • Martha's Vineyard Fishermen's Preservation Trust	Low	
			Recommendation 2	Identify a select group of fishermen to assist with research by documenting bycatch details such as the percentage of seed and the types and abundance of predators.	• Menemsha Research Collaborative* • Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah) Natural Resources Department • Martha's Vineyard Fishermen's Preservation Trust	Low	
Harvest Documentation	**Goal I: Manage based on accurate and complete data on the amount and location of shellfish harvested**	**Objective I: Improve methods of recording commercial and recreational shellfish landings to ensure a complete and accurate accounting of the harvest**	**Recommendation 1**	Continue to utilize records from shanties to help monitor and verify commercial landings. Additionally, continue to utilize records from shanties for enforcement of limits.	• Town Shellfish Departments and/or the Wampanoag Tribe of Gay Head (Aquinnah) Natural Resources Department	Med	
			Recommendation 2	Implement a means to track the general locations where shellfish were harvested—both recreationally and commercially.	• Town Shellfish Departments and/or the Wampanoag Tribe of Gay Head (Aquinnah) Natural Resources Department	Med	

Support of the Commercial Shellfishery	**Goal I: Support the economic and physical structures of a viable shellfishery for both economic and traditional purposes**	**Objective I: Improve strategies to optimize the dollar value of harvested shellfish**	**Recommendation 1**	Develop marketing strategies, such as branding the Menemsha Pond scallop and/or controlling the rate at which scallops reach the market, to optimize the price of the Menemsha Pond bay scallop.	• Menemsha Research Collaborative* • Martha's Vineyard Fishermen's Preservation Trust • Shellfishermen	Med	
			Recommendation 2	Consider establishing a co-op for marketing purposes. As part of the development of this co-op, consider making participation optional, and look to other co-ops for examples of good strategies.	• Menemsha Research Collaborative* • Martha's Vineyard Fishermen's Preservation Trust • Shellfishermen	Low	
			Recommendation 3	Develop marketing strategies to enhance the value of the Menemsha Pond Complex shellfish by-products.	• Menemsha Research Collaborative* • Martha's Vineyard Fishermen's Preservation Trust • Shellfishermen	Low	
			Recommendation 4	Review options for timed fishing closures to ensure the quality and consistency of product reaching the market.	• Towns of Aquinnah, Chilmark, and/or the Wampanoag Tribe of Gay Head (Aquinnah) Natural Resources Department • Town Shellfish Committees • Martha's Vineyard Shellfish Group, Inc.	Low	
			Recommendation 5	Explore the apparent correlation between the price of scallops and number of buyers. Determine whether or not the number of buyers affects the price they are willing to pay.	• Menemsha Research Collaborative* • Martha's Vineyard Fishermen's Preservation Trust • Shellfishermen	Low	
		Objective II: Improve training needed to maintain a viable shellfishery.	**Recommendation 1**	Continue to enhance and implement a mentoring program to assist new entries into the fishery. As part of the enhancement, develop a check-list of topics for the teaching captain to cover with the apprentice. The checklist would include topics such as how to identify a legal bay scallop (to be taught by a Warden or shellfish biologist), how to cull a catch, a review of the regulations, and general etiquette at sea.	• Town Shellfish Committees • Wampanoag Tribe of Gay Head (Aquinnah) Natural Resources Department • Martha's Vineyard Shellfish Group, Inc. • Menemsha Research Collaborative* • Martha's Vineyard Fishermen's Preservation Trust • Shellfishermen	Med	

Adaptation of Plan	**Goal I: The Shellfish Management Plan should respond to changing conditions in order to ensure that shellfish resources are not depleted below sustainable levels, thus ending the shellfish industry in Menemsha Pond.**	**Objective I: Shellfish management should be adaptive (i.e., can change from year to year or even during the season based on key pieces of information).**	**Recommendation 1**	Bring together a group of people ("Menemsha Research Collaborative") responsible for overseeing the implementation and adaptation of this Plan. This group should meet regularly and should include representatives from multiple stakeholder groups including recreational fishermen, commercial fishermen, SHAB, the Department of Natural Resources, scientists, and managers. Off-Island expertise should be included as appropriate. Three-year term limits should be established for this Committee. The group should work closely with not for- profit entities to help raise funds for management plan research and implementation activities, identify common data reporting/gathering techniques, prioritize research projects, and address other research-related issues.	• Town Shellfish Committees • Wampanoag Tribe of Gay Head (Aquinnah) Natural Resources Department • Martha's Vineyard Shellfish Group, Inc. • Menemsha Research Collaborative* • Martha's Vineyard Fishermen's Preservation Trust • Shellfishermen	High	
			Recommendation 2	Establish a system whereby a review of coordinated threshold criteria (e.g., number of weather related fishing days lost, seed density, stock assessments, etc.) or a valid concern raised by a citizen would initiate a public process to address the issue(s)—including possible management actions.	• Town Selectboards • Town Shellfish Committees • Wampanoag Tribe of Gay Head (Aquinnah) Natural Resources Department • Martha's Vineyard Shellfish Group, Inc. • Menemsha Research Collaborative* • Martha's Vineyard Fishermen's Preservation Trust • Shellfishermen • MA Division of Marine Fisheries	Low	
			Recommendation 3	Review and revise the Shellfish Management Plan every three years.	• Town Selectboards • Town Shellfish Committees • Wampanoag Tribe of Gay Head (Aquinnah) Natural Resources Department • Martha's Vineyard Shellfish Group, Inc. • Menemsha Research Collaborative* • Martha's Vineyard Fishermen's Preservation Trust • MA Division of Marine Fisheries	Med	

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Web Resources:

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Cape Cod Commercial Fishermen's Alliance: http://capecodfishermen.org/

Cape Cod Fisheries Trust: https://ccft.fishhub.org/

East Coast Shellfish Growers Association: http://www.ecsga.org/

Local Catch: http://www.localcatch.org/about.html

Martha's Vineyard/Dukes County Fishermen's Association:
http://www.dukescounty.org/pages/DukesCountyMA_Fishermen/Index

The Martha's Vineyard Fishermen's Preservation Trust (MVFPT) :
http://mvfishermenspreservationtrust.org/

Martha's Vineyard Shellfish Group, Inc.: http://www.mvshellfishgroup.org/

Massachusetts Department of Food and Agriculture: http://www.mass.gov/agr/

Massachusetts Division of Marine Fisheries: http://www.mass.gov/eea/agencies/dfg/dmf/

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APPENDIX C: CONSIDERATIONS FOR DEVELOPING A MARKETING COLLABORATIVE

In the broadest sense, a cooperative (or co-op) is simply a group of people working together to collectively improve their situation. There is a long history of such cooperatives for the purposes of energy production, localized wastewater treatment, agricultural crop raising and marketing, craft sales, and so on. The marketing of scallops from Menemsha waters is considerably more focused but there is much that can be transferred from these broader initiatives. To some extent, works begun by the Martha's Vineyard Shellfish Group, Inc. and the Vineyard Wild Caught initiative have made a solid difference in marketing local fish. "Romancing the Oyster" has become an annual event showcasing locally farmed shellfish. Not only does this serve as an opportunity to show off the quality of the food raised in the community; it also serves as a fundraiser benefitting the Martha's Vineyard Shellfish Group – an organization committed to growing shellfish seed and distributing it to the towns in Dukes County.

The areas of marketing and product sales have historically been the purview of individual fishermen. From time to time there have been discussions of ways to improve the product value of "Menemsha Bay Scallops" (as opposed to those taken or produced in other locations) with the implication that scallops from the Island's waters should be considered more desirable. To date there has been marginal implementation of any of these ideas.

The Committee's recommendation is that a cooperative, group effort could lead to the "branding" of Vineyard Scallops and a marketing effort that would result in higher prices per unit for scallops taken in local waters.

Benefits of a Cooperative

At a 2010 workshop sponsored by the University of Maine SeaGrant Program (www.seagrant.umaine.edu/extension/shellfish-marketing), Robert Rheault, the Executive Director of the East Coast Shellfish Growers Association discussed how their cooperative worked in the production and marketing of shellfish raised through aquaculture. Many of his points are applicable to potential use on Martha's Vineyard.

Rheault began by stating his group's experience that the branding and appropriate marketing of specific groups of shellfish could add about 8% to the sale price of the product. In this process he emphasized the role of the co-op as a "price maker" (the entity that can, if not entirely control the price of the product, work with an existing distribution system to improve the price) rather than a "price taker" (an entity that takes whatever price a buyer sets). This enhanced value can sometimes be the difference between economic success and failure on the part of the growers; or, in the case on Menemsha, the fishermen.

This enhanced value was accomplished by establishing the product as a recognized brand, complete with a brand description, marketing materials, logos, and packaging. His organization worked to establish brand recognition as well as "product category." For Menemsha, the message would be something like, "Shellfish are good, and Menemsha Scallops are the best." Rheault emphasized that building brand recognition is not an overnight occurrence; it can take years to build such brand recognition. (The benefits can be destroyed overnight, however, with one instance of poor quality or service.)

Marketing differs from broad-scale advertising in that it is focused on a particular market and offers a message tailored to that market. If a market survey shows that most shellfish are sold to restaurants,

for example, the marketing might emphasize such aspects as freshness, healthfulness, consistency in size and appearance (important to chefs), and distinctive taste. A goal might be to have the name Menemsha scallops listed on a menu as a specialty item. Shellfish growers sometimes compare their product to wines; just as Riesling grapes can be grown in many different areas, each producing its own distinct flavoring of wine—distinct to the "sophisticated" wine fancier—so too can shellfish from specific area bring their own distinctive taste to the table.

Establishment of a Cooperative

There are several guides to establishing cooperatives available through government or non-profit entities. The US Department of Agriculture has an entire office dedicated to various types of cooperatives through its Rural Business-Cooperative Service Branch. The Cooperative Development Institute; Northeast Center for Cooperative Business in South Deerfield, MA (www.cdi.coop) provides "education, training and technical assistance to start-up cooperatively-structured enterprises in all business sectors."

The Committee's recommendation for a cooperative is limited to enhancing market access and broadening of market opportunities. As such, it is an extension of existing activities of the fishermen. A typical process for determining the need or desirability for a co-op and its implementation if determined to be desirable would follow a pattern somewhat similar to that following.

- Determining whether there is a need and/or opportunity for cooperative efforts

  Generally this would entail a survey of the existing fishermen to see whether they see sufficient potential benefits to even continue the discussion.

- Establishing the level of interest

  Is there a broad section of the industry willing to participate? Will there be sufficient interest to provide financial support to further the process? Will there be sufficient interest to participate in meetings, committee work, etc.?

- Conducting a Feasibility Study for a co-op.

  This would involve a more formalized market analysis and cost analysis for the efforts anticipated by the co-op and a preliminary cost-benefit analysis for participants. It is critical that this step involve an impartial market analysis and not merely rely on unsubstantiated opinions.

- Developing a Business Plan

  What sort of administrative/management structure will be needed to operate the co-op? What sort of financing will be required for both start-up and continuing operation? What will be the "end products" of the co-op and how will they be developed?

- Developing a Marketing Plan

  Who are the competitors now? How will they react to the co-op development and implementation? What is the current product distribution system and will it change with the establishment of a co-op? How will success be determined?

Disadvantages of a Co-op

There can be a downside to the establishment of a cooperative and any group contemplating such an exercise would do well to consider these and decide whether they are applicable in the particular instance under consideration.

Some of the potential disadvantages include:

- Members have to give up some of their independence and function in a group setting rather than individuals.
- Depending on the Business Plan of the Co-op, there may be a cost to the individual members. The Business Plan should give a realistic estimate as to when the benefits will outweigh the costs, but this will only be an estimate and unexpected situations may affect the pay-back time.
- There needs to be broad participation and support by members of the industry (in this case the Menemsha scallop fishermen), otherwise there could be a situation where a limited few are working to improve the value of the entire crop—a situation that is ripe for failure.
- It may be necessary to hire staff for the implementation of the marketing effort. This involves oversight of personnel, meeting payrolls, and various logistical actions.

Example of a Co-op comparable to that recommended for Menemsha

The Copper River/Prince William Sound Marketing Association, based in Cordova, AK (http://copperrivermarketing.org/) was established to "develop regional seafood brands" and prepare and implement a broad-based marketing plan to promote those brands. They define the purposes of the organization to:

- Develop regional seafood brands.
- Develop marketing plan for regions brands.
- Secure funds and implement the marketing plan.
- Facilitate member marketing program through common development of informational documents, market research, and promotion.
- Promote, foster and encourage quality assurance standards to attain highest industry standards.
- Promote improvements to the commercial fishing industry infrastructure in the region.

To implement these actions the group has incorporated as a non-profit organization under federal and state tax laws and created a Board of Directors and staff to administer the organization programs. Some of the specific activities they undertake (as described on their web site) are to:

- Coordinate site visits for the press,
- Host events for food writers,
- Provide a listing of where to get product and contacts for fishers who sell directly to restaurants/retailers,
- Establish and/or link to consumer web sites using or mentioning their product (think MenemshaScallops.com),
- Participate in seafood shows across the country
- Prepare public relations/press releases on their products that tell the story of the product, provide fishermen profiles (i.e., "humanize" or "put a face on" the product), provide the history and tradition of the fishery, etc.,
- Utilize social media such as Facebook to get their message out to a wider segment of the public, and

- Prepare printed materials common to the fishery (as opposed to specific fishers) including informational brochures, promotional materials, flyers and packaging used as part of product shipments.

For Further information

Contacts

Cooperative Development Institute; Northeast Center for Cooperative Business

South Deerfield, MA

(413) 665-1271

info@cdi.coop

www.cdi.coop

Copper River/Prince William Sound Marketing Association

509 First Street - P.O. Box 199

Cordova, AK 99574 (907) 424-

3459

info@copperrivermarketing.org

http://copperrivermarketing.org

Robert Rheault,

Executive Director, East Coast Shellfish Growers Assoc.

(401) 783-3360

bob@moonstoneoysters.com

William Brockhouse, USDA

U.S. Department of Agriculture"

Rural Business-Cooperative Service"

Cooperative Programs

Washington, DC. (202) 720-2021

bill.brockhouse@wdc.usda.gov!

Bibliography

Many of the following materials relate to aquaculture. Despite being based on a “wild” crop, because the Menemsha scallop industry involves a single species taken from a well-defined, limited area, it has many similarities to aquaculture.

Free Publications

From the USDA Rural Business-Cooperative Service

How to Start a Cooperative

www.rurdev.usda.gov/rbs/pub/cir7/cir7rpt.htm

Understanding the Cooperatives: Who Runs the Cooperative Business?

www.rurdev.usda.gov/rbs/pub/cir456.pdf

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www.rurdev.usda.gov/rbs/pub/cir55/cir55rpt.htm

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APPENDIX D: SEAFOOD BRANDING AND MARKETING INITIATIVES

While there is no universal definition for environmental labeling or eco-labeling, the Organisation for Economic Co-operation and Development (OECD) has defined environmental labeling as the "*voluntary granting of labels by a private or public body in order to inform consumers and thereby promote consumer products which are determined to be environmentally more friendly than other functionally and competitively similar products*" (http://www.fao.org/fishery/topic/12283/en).

Ecolabeling is a market-based economic instrument that seeks to direct consumers' purchasing behavior so they consider product characteristics other than price. These characteristics may be associated with economic, social, environmental, or ecological objectives. Consumers' preferences for different characteristics will produce price and/or market share differentiation between products with and without ecolabels. These differences provide economic incentive for businesses to seek product certification under the ecolabel. Consumers are provided with relevant product information via the ecolabel that may impact their purchasing and consumption decisions (http://www.fao.org/fishery/topic/12283/en).

In the case of seafood branding, the labeling program appeals to consumer preferences for sustainably harvested, high-quality seafood from a known, local source, and also a desire to support community businesses and grow the local economy. The program encourages these consumer preferences by identifying seafood that meets these criteria as defined in program standards. The suppliers in the seafood industry therefore have financial motivation to seek certification under the program to profit from these consumer preferences and to support their own interests.

The following is a summary of primary seafood branding programs operating at an international, regional, or state-level.

Marine Stewardship Council

The Marine Stewardship Council (MSC) (http://www.msc.org/) is a global, independent, non-profit organization designed to use ecolabel and fish certification programs to: (1) recognize and reward sustainable fishing practices, and thereby contribute to health of the world's oceans; (2) influence consumer seafood purchases; and (3) work with partner organizations to create a sustainable seafood market. These MSC programs are the first in the world to be completely consistent with the United Nations Food and Agriculture Organization (FAO) Guidelines for the Eco-labeling of Fish and Fishery Products from Marine Capture Fisheries.

The MSC is recognized as the global leader in certification for sustainable wild-capture seafood. The Council distinguishes itself through its scientific approach, independence, and transparency. The MSC has two core standards: (1) MSC environmental standard for sustainable fishing; and (2) MSC chain of custody standard for seafood traceability. Fisheries and seafood businesses voluntarily seek certification against the relevant standard.

MSC Standards

Sustainable Fishing

The MSC standard for sustainable fishing (http://www.msc.org/documents/scheme-documents/msc-standards/MSC_environmental_standard_for_sustainable_fishing.pdf) has 3 overarching principles, each supported by detailed criteria, that every fishery must prove that it meets:

Principle 1: Sustainable fish stocks
The fishing activity must be at a level which is sustainable for the fish population. Any certified fishery must operate so that fishing can continue indefinitely and is not overexploiting the resources. For those populations that are depleted, the fishery must operate in a manner that demonstrably leads to their recovery.

Principle 2: Minimizing environmental impact
Fishing operations should be managed to maintain the structure, productivity, function and diversity of the ecosystem on which the fishery depends.

Principle 3: Effective management
The fishery must meet all local, national and international laws and must have a management system in place to respond to changing circumstances and maintain sustainability.

Each of these three principles are developed further by detailed criteria in the MSC Environmental Standard for Sustainable Fishing

Seafood Traceability

The MSC standard for seafood traceability (http://www.msc.org/documents/scheme-documents/msc-standards/msc-coc-standard-v3) has 4 overarching principles, each supported by detailed criteria, that every fishery must prove that it meets:

Principle 1: The organization shall have a management system

Principle 2: The organization shall operate a traceability system

Principle 3: There shall be no substitution of certified products with non-certified products

Principle 4: There shall be a system to ensure all certified products are identified

MSC Certification Requirements

The MSC certification requirements (1) establish how the two core standards should be interpreted by certifiers conducting assessments; (2) ensure proper assessment methodology of fisheries and businesses against MSC standards; and (3) ensure consistent assessments against MSC standards regardless of when, where, and by whom the assessment is performed. The most current MSC certification requirements can be found at: http://www.msc.org/documents/scheme-documents/msc-scheme-requirements/msc-certification-requirements-v1.2/view

Third Party Certification

MSC operates a third party certification program (http://www.msc.org/about-us/standards/third-party-certification). This type of program is central to MSC impartiality and credibility. MSC establishes standards for sustainable fishing or seafood traceability, and fisheries and businesses can be certified if they meet these standards. Under a third party certification program, however, MSC establishes the standards but it does not conduct certification assessments or issue certificates. Instead, independently accredited certifiers perform impartial assessments of fisheries and businesses using MSC standards. In addition, as another level of impartiality, a third organization Accreditation Services International GmbH (ASI) conducts the accreditation of independent certifiers to conduct MSC assessments.

In contrast, in second-party certification an organization, product or service, meets standards established by peers, such as an industry association. In first-party certification, an organization, product, or service establishes the standards and assesses itself against those standards. A third-

party certification, conducted by impartial experts, therefore offers the highest level of quality assurance and lack of bias.

Review process for MSC standards & certification requirements

MSC standards are officially reviewed every 5 years in an inclusive, transparent, and multi-stakeholder process that follows the MSC Standard Setting Procedure (http://www.msc.org/about-us/standards/review).

MSC certification requirements also are reviewed regularly by the MSC Technical Advisory Board (TAB) to keep up with the most current scientific knowledge and industry practices (http://www.msc.org/about-us/standards/reviewing-methodologies).

Success and Criticism

The reputation of the MSC continues to expand across the globe. According to 2010 research conducted in the United States, Canada, United Kingdom, Germany, France, and Japan, 23% of adults are aware of the MSC ecolabel program (http://www.msc.org/newsroom/news/latest-research-shows-leap-in-public-awareness-of-the-msc-ecolabel). This recognition is a significant increase from 9% in 2008.

In January 2012, however, eight major Alaska salmon processors, which constitute approximately 72% of the Alaska salmon catch, withdrew from participation in the MSC certification program, effective October 2012 (http://www.msc.org/newsroom/news/msc-statement-regarding-alaska-salmon). These processors claim the process of MSC recertification every five years is cumbersome and expensive and they wish to seek a broader marketing message. In addition, the processors assert the MSC certification was an independent affirmation of an already established and invariable fact, namely that since statehood, Alaska's salmon fishery has always been sustainably managed (http://pressroom.alaskaseafood.org/alaska-salmon-processors-pull-back-from-msc-fao-based-certification-gets-a-boost/).

Some critics also claim that MSC certification has lost cache because of its increased prominence and prevalence in the seafood industry. MSC also has been criticized for the certification of controversial fisheries with questionable sustainability, such as Patagonian toothfish (Chilean Seabass) and Antarctic krill.

Gulf of Maine Responsibly Harvested Program

The Gulf of Maine Responsibly Harvested branding program was developed by the Sustainable Seafood Initiative within the Gulf of Maine Research Institute (GMRI), an independent, non-profit, marine research and education institution. The program is designed to: (1) Reward traceable and responsibly harvested seafood products through market differentiation; (2) Enable consumers to support products that they can feel good about; (3) Motivate improvements to the sustainable harvest and traceability of Gulf of Maine seafood; (4) Unify the region's seafood industry around a shared identity; and (5) Achieve an economically and ecologically thriving and stable seafood industry (http://www.gmri.org/mini/index.asp?ID=33&p=111).

In contrast to the Marine Stewardship Council, a third-party certification program where one party establishes the standards but another independent party conducts certification against the standard, the Gulf of Maine Responsibly Harvested Program is a first-party certification program where the same part both establishes the standards and conducts certification. The Gulf of Maine Responsibly Harvested Program describes itself as a verification program instead of a certification program.

Standard for Responsibly Harvested Seafood

Overall the Gulf of Maine Responsibly Harvested brand signifies the following standards:

1. The seafood product was harvested or grown and processed in the Gulf of Maine region and meets criteria regarding sustainability and traceability;
2. Supply chain participants have made a commitment to the continuous improvement to the Gulf of Maine seafood industry;
3. A portion of the proceeds supports the Gulf of Maine Research Institute's efforts to motivate and reward improvements to the sustainable harvest of seafood.

The Gulf of Maine Responsibly Harvested brand has developed standards for both wild and farmed species (http://www.gmri.org/upload/files/GMRH_Standard_with_Header[1].pdf). These standards were developed through engagement with fisheries management authorities, the fishing industry, the scientific community, environmental interest groups, fish processors, dealers, and retailers. In addition, the standards were based on notable existing seafood branding standards and programs, including the FAO guidelines and MSC standards discussed in the above section.

Standard for Wild Seafood

For *wild* seafood to qualify for participation in the program, the seafood must have been harvested at a level that enables utilization while maintaining its availability for present and future generations. This includes the following:

- Fisheries are managed by competent authorities and have management plans in place that incorporate a science-based approach to ensure sustainability.
- If stock sizes are below management target levels, whether due to natural or man-made causes, management plans are established that enable rebuilding within a specified timeframe.
- Sufficient data exists to determine harvest levels.
- Monitoring and compliance measures are in place to ensure acceptable harvest levels.
- Enforcement exists to ensure that harvesters follow regulations, and to prevent illegal practices and unreported harvest.

Standard for Farmed Seafood

For *farmed* seafood to qualify for participation in the program, production must comply with all state and federal regulations, including the following:

- Indigenous marine life and its environment are not threatened.
- Discharge of drugs and pesticides is prevented.
- Discharges of excess feed are minimized.
- Numbers and weights of animals, amounts of feed, and frequency of cleaning, inspections, maintenance, and repairs are recorded and available.

In addition to the seafood product meeting the criteria outlined above, participants in this cooperative branding program must demonstrate the following:

- The seafood product meets all relevant government regulations regarding its production.
- The seafood product is traceable from the management area or farm in which it was harvested to the point of sale.
- The seafood product was harvested or grown, and processed within the region, which is defined above.

There is no automatic assessment of specific wild or farmed seafood. Instead GMRI will assess fisheries and farms on an ongoing basis based on available time and resources. A seafood supply chain partner seeking GMRI certification must submit an application that includes a description of the seafood product, proof of traceability, and an outline of how the applicant will contribute to seafood sustainability in the coming year. GMRI does recognize other existing seafood branding efforts, however, and those fisheries and other seafood businesses that are certified under the Marine Stewardship Council, Global Aquaculture Alliance's Aquaculture Certification Council, or the Maine Aquaculture Association will be considered by GMRI to satisfy the sustainability and traceability requirements of the GMRI brand.

But, there are automatic qualifiers—MSC and others.

Participant annual review and traceability audit

A supply chain partner who seeks to maintain GMRI certification must submit to an annual review and traceability audit.

Review process for Gulf of Maine Responsibly Harvested Standards

GMRI will conduct an annual standards review. GMRI will consult with the fishing community, including management authorities, industry, scientists, consumers and environmental groups, in this review. After two years of implementation, GMRI will engage a third party to conduct a critical review.

Current Status

As of February 2012, the Gulf of Maine Responsibly Harvested Program has verified the following seven species: Haddock, Northern Shrimp (US), American Lobster, Atlantic Cod (US), Atlantic Sea Scallops (US), Atlantic Pollock, and Whiting (Silver Hake) (US).

Maine

Port Clyde Fresh Catch

In an effort to preserve their fishing heritage, small community, and fishing resources, the fishermen based in the small village of Port Clyde, Maine developed the Port Clyde Fresh Catch™ brand (www.portclydefreshcatch.com). Under the brand, wild seafood is caught locally in the Gulf of Maine and harvested using environmentally conscious fishing methods. The brand guarantees 100% supply-chain traceability that begins at harvest, and continues through packaging at the Port Clyde-based, Hazard Analysis and Critical Control Point (HAACP)-certified processing facility.

Port Clyde's fleet consists of approximately one dozen groundfishing vessels that fish from Portland to the Canadian border. Catch includes shrimp and groundfish, including haddock, flounder, cod, pollock, and hake. Catch is sold through wholesale and their local Community Supported Fishery.

Port Clyde developed the first Community Supported Fishery (CSF) in the nation. Community Supported Fisheries are analogous to the Community Supported Agriculture (CSA) model. CSF customers pre-purchase a "share" or specific quantity of seasonal catch. Various share sizes are available to suit customer needs. These seafood shares are delivered weekly, biweekly or monthly, depending on the program, to a designated delivery located during a specific time slot. Through the CSF the customer receives exceptionally fresh, high-quality, local seafood at a competitive price, and can directly support local fishermen and the community. In return the fishermen receive crucial pre-season capital to finance their fishing efforts, increased profit by selling direct to consumers, and a guaranteed market for their variety of seasonal catch. Many fishing communities across the country have followed Port Clyde's example and established their own local branding and associated CSF.

Massachusetts

Cape Ann Fresh Catch

The Gloucester Fisherman's Wives Association followed the example of Port Clyde and established the Cape Ann Fresh Catch (CAFC) Community Supported Fishery (CSF) in 2008, with initial delivery in June 2009 (http://www.capeannfreshcatch.org/index.html). CAFC has established a CSF based on sustainably caught local seafood from the Gulf of Maine, but does not publicly advertise a trademarked brand name.

CAFC offers weekly and biweekly shares of whole fish, fillets, and alternating whole/fillet available five days per week, at a total of 16 pick-up locations. CSF catch varies according to season but is comprised primarily of groundfish, such as cod, hake, haddock, pollock, whiting, and flatfishes, such as yellowtail flounder and grey sole.

Seafood Marketing Commission

The Commonwealth of Massachusetts has established a Seafood Marketing Commission, which held its first official meeting on January 31, 2012. The Commission is comprised of lawmakers, state officials, restaurant owners, and commercial fishermen. The goal of the Commission is "to brand Massachusetts seafood—the way Maine does with lobster and Alaska promotes salmon—as a healthy, sustainable food that supports the local economy" (Abelson, 2012). The Commission is investigating current seafood branding programs in other states and pursuing funding to launch a Massachusetts branding program.

New Hampshire

NH Fresh & Local Seafood

The NH Fresh & Local Seafood brand originated from collaboration between New Hampshire Sea Grant, the City of Portsmouth, and local commercial fishermen (http://extension.unh.edu/Marine/NHSeafood.htm). The brand signifies seafood that is sustainably caught and processed in New Hampshire. NH Fresh & Local Seafood Branding Standards are available at http://extension.unh.edu/marine/Docs/NHS-standards-v1-11.pdf. The program currently has 12 local restaurant partners, 10 retail partners, and 4 wholesale partners.

New Jersey

Jersey Seafood

The Jersey Seafood brand and logo (http://www.jerseyseafood.nj.gov/) were established by state statute in 2008 (http://www.jerseyseafood.nj.gov/Seafoodreg.pdf) under the New Jersey Department of Agriculture. The program is modeled after the state's Jersey Fresh branding program for agricultural produce.

Aquatic farmers, commercial seafood harvesters, and packer/processors of New Jersey seafood may apply for a license from the New Jersey Department of Agriculture to market their products using the Jersey Seafood logo.

North Carolina

Several local fishing communities in North Carolina have established local seafood branding programs, including the following:

- Outer Banks Catch (http://www.outerbankscatch.com)
- Carteret Catch (http://carteretcatch.org/)
- Brunswick Catch (http://www.brunswickcatch.com)
- Ocracoke Fresh (http://www.ocracokeseafood.com)

All of these seafood recognition programs are local initiatives to sustain the livelihood and heritage of the local fishing industry, and to promote the benefits of eating and buying local seafood. None of these programs are initiated by state statute; however, they are often a product of collaboration between local fishing industry associations, North Carolina Sea Grant, and other interested organizations. In all programs, the brand signifies seafood caught by the local county or island fishermen.

Alaska

Alaska Seafood

The Alaska Seafood branding and marketing program is a professional, extensive and comprehensive program managed by the Alaska Seafood Marketing Initiative (ASMI) (http://www.alaskaseafood.org). ASMI is a public-private partnership between the State of Alaska and the Alaska seafood industry. The mission of ASMI is to increase the economic value of the Alaska seafood resource through the following measures:

- Increasing the positive awareness of the Alaska Seafood brand,
- Collaborative marketing programs that align ASMI and industry marketing efforts for maximum impact within the food industry,
- Long-term proactive marketing planning,
- Quality assurance, technical industry analysis, education, advocacy and research, and
- Prudent, efficient fiscal management.

ASMI also oversees Alaska Seafood certification under sustainability standards (http://sustainability.alaskaseafood.org/certification) and chain of custody standards (http://sustainability.alaskaseafood.org/chain-of-custody). These certifications assure customers that only sustainable seafood from a certified Alaska fishery will carry the Alaska Seafood brand label.

Louisiana

Louisiana Wild Seafood Certification Program

Funding for this program was provided by British Petroleum (BP) following the Deepwater Horizon oil spill in the Gulf of Mexico in April 2010. BP awarded $48 million to the Louisiana Department of Wildlife and Fisheries. This award includes $18 million for seafood safety testing and $30 million for an extensive marketing and advertising campaign. The funds for each program will be paid out over a three-year period (http://www.louisianaseafoodnews.com/2011/11/23/where-and-when-the-money-flows-%E2%80%93-applying-bp-dollars-for-louisiana-seafood-industry-restoration/).

The Louisiana Wild Seafood Certification Program (LWSCP) was established by state statute as a collaborative effort among state agencies: "The secretary of the Department of Wildlife and Fisheries is authorized to establish a quality certification program for Louisiana wild fish [as defined by statute]…and for Louisiana wild seafood products, including wild-caught shrimp, which are taken, harvested, or landed in Louisiana… in cooperation with the Louisiana Department of Agriculture and Forestry, Louisiana Department of Health and Hospitals, Louisiana State University, and any other state or federal agency deemed appropriate." (http://www.legis.state.la.us/lss/lss.asp?doc=727850).

An overview of the program can be found at:

- http://www.wlf.louisiana.gov/sites/default/files/pdf/document/6584-LA%20Wild%20Seafood%20Certification%20Program%20Overview/La_Certification_Program_Overview_4-23-10.pdf
- http://www.wlf.louisiana.gov/sites/default/files/pdf/shrimp_task_force/34822-Shrimp%20Task%20Force%20Meeting%20Thursday,%20November%2029,%202011/lwscp_-_rene_-_stf.pdf

The program is expected to launch in spring 2012.

References:

Abelson, Jenn. "State officials say they want to find ways to better market local fish." *Boston Globe* 31 January 2012. Website: http://www.boston.com/Boston/businessupdates/2012/01/state-officials-say-they-want-find-ways-better-market-local fish/gDt8EuVXQLfioonCrPvaHJ/index.html

APPENDIX E: MFC APPROVES NEW COMMERCIAL AND RECREATIONAL MEASURES & FINALIZES BAY SCALLOP MEASURES

Paul J. Diodati
Director

Commonwealth of Massachusetts
Division of Marine Fisheries
251 Causeway Street, Suite 400
Boston, MA 02114
(617) 626.1520
Fax (617) 626.1509

Deval Patrick
Governor
Ian Bowles
Secretary
Mary B. Griffin
Commissioner

April 7, 2009
MarineFisheries Advisory

MFC APPROVES NEW COMMERCIAL AND RECREATIONAL MEASURES & FINALIZES BAY SCALLOP MEASURES –
Protected species, pelagic species net fisheries, striped bass, spiny dogfish, lobster trap tag deadline, black sea bass, scup and summer flounder (fluke)

At March 12 & April 2, 2009 business meetings the Massachusetts Marine Fisheries Advisory Commission (MFC) approved management measures for several commercial and recreational fisheries. In March, the MFC approved Division of Marine Fisheries (*MarineFisheries*) recommendations governing 1) use of nets to fish for pelagic fisheries in inshore areas, 2) use of fixed gear as mandated by federal updates to the Atlantic Large Whale Take Reduction Plan and Harbor Porpoise Take Reduction Plan, 3) disposal of striped bass racks at-sea by for-hire vessels, 4) control date for spiny dogfish fishery, and 5) deadline for affixing annual trap tags to pots for use in Outer Cape Cod Lobster Conservation Management Area (Outer Cape LCMA).

In April, the MFC finalized *MarineFisheries* recommendations to 6) increase recreational minimum size for black sea bass, 7) amend season, possession limit and minimum size for recreational fluke fishery, 8) amend season, possession limit and no-fishing days for commercial black sea bass fishery, and 9) amend season, no-fishing days and weir quota set-aside for commercial scup fishery.

Also, this notice announces final action previously taken on bay scallop harvest rules pertaining to the definition of "seed scallops" that replace an earlier emergency action.

1. Inshore Net Regulations for Pelagic Fisheries

The MFAC approved *MarineFisheries* recommendations, which implement net specifications and performance standards in the Commonwealth's nearshore pelagic fisheries (322 CMR 4.02, 4.14, 4.15, 6.07, 7.00 & 12.00). Approved measures:

a. specify that a Coastal Access Permit (CAP) for mobile gear is required to use purse seines, but that moratorium on new CAPs does not apply to those being issued specifically for the use of purse seines;

b. specify that the 72-foot maximum vessel length limit for CAP holders does apply to purse seine vessels but certain permit holders who have fished purse seines with vessels longer than 72-feet in waters under the jurisdiction of the Commonwealth since 1995 may be exempt from the vessel size limit;

c. establish a distinct commercial surface gillnet endorsement, separate from a sink gillnet endorsement;

d. increase the maximum gillnet size from 200 to 250 square feet that could be used and still be exempt from surface gillnet permit requirement;

e. clarify requirement that any person using a surface gillnet for purposes of obtaining and selling bait to a person who is not a licensed dealer must obtain both a commercial fishermen's permit and a bait dealer's permit;

f. clarify that vessels using or possessing surface gillnets shall not be precluded from possessing striped bass under a longstanding regulation that prohibits striped bass possession for vessels "rigged for netting;"

g. require all fishermen fishing surface gillnets to remain within 200 feet of the net at all times. This recommendation increases the maximum distance from 100 feet proposed at public hearing;

h. approve a maximum net length of 300 linear feet fishing at any one time. Permit holders seeking to fish longer nets or setting overnight without tending may be permitted through experimental fishery permits;

i. require that for each 50 linear feet of gillnet, at least one headrope float must be marked with the letters "SGN" as well as the DMF 6-digit permit number, and a buoy marking scheme that includes reflective tape and the 6-digit number;

j. prohibit use of more than one net in the water at a time; additional nets must be stowed aboard the vessel;

k. approve maximum mesh opening of 3 ¾" and a minimum mesh opening of 1 7/8." This recommendation liberalizes the minimum mesh size from 2 ½" down to 1 7/8";

l. enact a seasonal river herring protection closure that prohibits the use of surface gillnets in south coastal waters prior to May 16 and in waters east and north of Cape Cod prior to June 1;

m. prohibit year-round use of surface gillnets in excess of 250 square feet in Buzzards Bay;

n. allow any person to use a cast net for purposes of catching bait species for personal use without a permit;

o. require any person using a cast net for purposes of obtaining bait for sale to a bait dealer to obtain a commercial fishing permit; and

p. require any person using a cast net for purposes of obtaining bait for sale to someone who is not a dealer to obtain both a commercial fishermen's permit and a bait dealer's permit.

2. Fixed Gear Requirements regarding Protected Species

MFC approved regulatory amendments to remain current with changes to the federal Atlantic Large Whale and Harbor Porpoise Take reduction Plans (322 CMR 4.13 & 12.00). Specifically revised regulations:

- require marking of fixed gear (gillnet and traps/pots) buoy lines with gear-specific 4-inch colored mark midway on the buoy line (see Table 1 for gear-specific colors). Note, recreational fishermen will not be required to mark their buoy lines until January 1, 2010;

Table 1. Gear-specific colors for marking buoy lines on fixed gear.

Gear	Color
Gillnets	Green
Traps/Pots	Red for all inshore lobster fishing (LCMA 1, 2 and Outer Cape)
	Black for offshore fishery (LCMA 3 only)
Exception, if color of rope is same as color code, a white mark may be substituted for the mandated color.	

- allow bottom gillnetters to re-gain access to a portion of waters in the northern Gulf of Maine that is no longer closed under the Harbor Porpoise Take Reduction Plan;

- prohibit use of bottom gillnets during March South of Cape Cod in waters under the jurisdiction of the Commonwealth west of the 70° 30' W longitude line and south of a line drawn westerly from the intersection of the 70° 30' W longitude line with the Mashpee shoreline;

- mandate use of pingers on bottom gillnets fished in Upper Massachusetts Bay and Ipswich Bay during specific times (see Table 2);

Table 2. Times and places when/where gillnetters must use pingers.

Area	Period during which bottom gillnets must have pingers
Upper Massachusetts Bay/Ipswich Bay from Marblehead to the New Hampshire Border	September 15 – May 31
Massachusetts Bay Area	December – February and April – May

For further details on area boundaries see 322 CMR 12.04(3).

- require gillnets be rigged with anchoring system with the holding power of at least 22-pound Danforth anchor (eliminates previous anchoring system options);

- require 600-lb weak link for trap/pot gear year-round, except during January 1 – May 15 in the Right Whale Critical Habitat when a 500-lb. weak link is required

3. Disposal of Striped Bass Racks At-sea by For-hire Vessels

MFC approved *MarineFisheries'* recommendation to allowing for-hire captains conducting charters to dispose of striped bass racks at-sea (322 CMR 6.07). *MarineFisheries* modified striped bass filet rules in the 1990s to allow for-hire operations to fillet striped bass while still at-sea. The modified regulation allowed charter boat operators to provide clients a service that is generally expected (for other species) throughout the industry but is prohibited by longstanding rules that prohibit "*a recreational fishermen to mutilate any striped bass in such a way as to interfere with or affect adequate measurement of the fish;*

MarineFisheries tested the practicality of removing "retention of racks" language from the rule, in 2008 under Letters of Authorization to for-hire permit holders allowing them not to retain racks. This modification was widely endorsed by the industry.

For-hire operators are reminded that fillets may not exceed more than four fillets per customer and the skin must be left on the fillet.

4. Spiny Dogfish Control Date

MFC approved a November 6, 2008 control date for the spiny dogfish fishery (322 CMR 7.04). No management measures have been proposed at this time in association with this date.

5. Trap Tag Deadline

The MFC approved *MarineFisheries'* recommendation to require commercial lobstermen authorized to fish traps in the Outer Cape Cod (OCC) Lobster Conservation Management Area to affix current trap tags by March 16th (322 CMR 6.31). This action will ensure all traps are tagged with current tags before they are returned to the OCC waters when the

January 15 – March 15th trap haul-out period lifts on March 16th. *MarineFisheries* also has amended the trap tag program policies to allow lobstermen to order trap tags as early as mid-November for the following year. This change in the policy allows OCC lobstermen, as well as all others across the state, to order trap tags well in advance of the deadlines.

6. Recreational Black Sea Bass

The MFC approved *MarineFisheries* recommendation to increase the recreational black sea bass from 12" to 12.5" (322 CMR 8.06). The fishery remains open year-round with a 20-fish per day possession limit. This action was taken to comply with the Atlantic States Marine Fisheries Commission (ASMFC) mandated reduction (10%) in harvest.

7. Recreational Summer Flounder (Fluke)

In 2009, recreational fishermen will be able to harvest up to 5-fluke at an 18.5" minimum size during July 1 – August 13 (322 CMR 8.06). This action increased the minimum size by ½" and shortened the season by 23 days. Based on disparate public hearing comments between private anglers and for-hire vessel operators, DMF intends to seek different rules in 2010 for the two sectors.

8. Commercial Black Sea Bass

The MFC approved a 2009 spring black sea bass fishery during May 1 – 24 on open fishing days Sunday, Tuesday and Thursday with a 500-lb trip limit for pots and weirs and 100-lb trip limit for all other gear types (Table 3). Pending available quota, the fishery would reopen on August 1.

Table 3. 2009 Commercial black sea bass limits (322 CMR 6.28)

Season	Gear Type	Open Fishing Days	Possession limit
Jan – April	All authorized gear types	All	100 lb
May 1 – May 24	Fish pot & weir	Sun, Tue, & Thurs.	500
	Lobster traps		100
	All other authorized gear types		100
August 1 – December **(quota dependent)**	Fish pot & weir	TBD*	TBD
	Lobster traps		TBD
	All other authorized gear types		TBD

* The Director may adjust the trip limits based on availability of quota.

9. Commercial Scup

The 2009 directed commercial scup fishery will be open on Sundays, Tuesdays, and Thursdays during the period May 1 – 31 and beginning August 1 until the quota is exhausted. The weir quota set-aside was increased to 177,000-lbs. Table 4 provides further details on trip limits and open fishing days.

Table 4. 2009 Commercial Summer/Fall Scup limits (322 CMR 6.28)

Season (quota dependent)	Gear Type	Open Fishing Days	Possession limit
May - October	Fish Weir	All	Weirs' landings shall be limited to 177,000 in aggregate
April 23 – June 9	Trawlers during squid & fluke seasons	All	400 lb
June 10 – Oct 31		Sun. through Thurs.	400 lb
May 1 – 31	Fish pot & hook-and-line	Sun, Tue & Thu	200 lb
Aug 1 - Oct 31		Mon. through Thursday	400 lb

10. Bay Scallop

Earlier in 2009 the Commission took action to finalize an emergency bay scallop rule that clarified the definition of seed scallops (322 CMR 6.11). The final rule establishes a regulatory prohibition on harvest and possession of seed scallops, defined as sexually immature scallops that do not bear a well-defined annual growth line. The growth line is expected to be at least 10 mm. from the hinge of the shell, but for those scallops that bear the well defined annual growth line less than 10 mm. from the hinge of the scallop, a minimum size of 2 ½" shall apply. This rule was enacted in response to a petition from the town of Nantucket.

For further information please visit our webpage at: www.mass.gov/marinefisheries.

APPENDIX F: REGULATIONS AS TO THE TAKINGS OF SHELLFISH – COMPARISON TABLE BETWEEN THE TOWNS OF CHILMARK AND AQUINNAH

Regulations as to the Taking of Shellfish

Color Code: Green denotes similar regulations between towns. Yellow denotes significant differences between town regulations. Blue indicates the same regulations between towns.

Chilmark	Aquinnah
	1.0 GENERAL REGULATIONS - All licensees must comply with these regulations and Massachusetts General Laws, Chapter 130.
1. A Chilmark Shellfish License is required to take Bay Scallops, Oysters, Quahogs (Hard-Shelled Clams), Steamers (Soft-Shelled Clams), Razor Clams, Mussels or Eels from the waters of Chilmark.	**1.1** An Aquinnah Shellfish License is required to take any and all types of shellfish from the waters of Aquinnah. Exempt from family/individual licensing by the Town is any person who is a member of the Wampanoag Tribe of Aquinnah, provided that while engaged in shell fishing, he/she is in possession of their tribal identification card. The exemption is not valid for any type of commercial shell fishing.
2. Any person who takes shellfish from the waters of Chilmark without a Chilmark Shellfish license, or any person who does so after his/her license has been revoked, or suspended and before it is reinstated, shall be punished by a fine of not less than fifty ($50.00) dollars nor more than one thousand ($1,000.00) dollars or by imprisonment for not more than three months, or both as is provided in Massachusetts General Laws Chapter 130, Section 2 as amended.	**3.1** Any person who takes shellfish from the waters of Aquinnah without an Aquinnah shellfish license, or Wampanoag identification card, or any person who does so after his/her license has been revoked, or suspended and before it is reinstated, shall be punished by a fine of not less than fifty ($50.00) dollars nor more than one thousand ($1,000.00) dollars or by imprisonment for not more than three months, or both, as is provided in Massachusetts General Laws Chapter 130, Section 2 as amended.
3. The penalty for a violation of these rules and regulations, except as stated above in section two (2) or elsewhere in these regulations, shall be: • First offense, suspension of the shellfish license for five (5) fishing days and/or not less than ten ($10.00) dollars nor more than fifty ($50.00) dollars. • Second offense, suspension of the shellfish license for fifteen (15) fishing days and/or a fine of not less than ten ($10.00) dollars and/or not more than fifty ($50.00) dollars. • Third offense, revocation of shellfish license for one calendar year.	**3.2** The penalty for a violation of the above stated rules and regulations, or elsewhere in these regulations, shall be: • First offense, suspension of the shellfish license for five (5) fishing days and/or not less than ten ($10.00) dollars nor more than fifty ($50.00) dollars. • Second offense, suspension of the shellfish license for fifteen (15) days and/or a fine of not less than ten ($10.00) dollars nor more than fifty ($50.00) dollars. • Third offense, revocation of shellfish license for one calendar year.
4. Shellfish licenses shall be valid from April 1 through March 31 or any part thereof, except for: • One (1) week non-resident family shellfish license which shall be valid for not more than seven (7) calendar days. All licensees must comply with these regulations and Massachusetts General Laws, Chapter 130.	**1.2** Shellfish licenses shall be valid from April 1 through March 31 or any part thereof.

5. Types of shellfish licenses that may be issued (All license fees are non-refundable): a. A COMMERCIAL SHELLFISH LICENSE may be issued to any permanent resident of Chilmark. No commercial shellfish permit may be granted to any person who has not resided in town for at least six (6) months preceding his/her application for a permit. The burden of proof shall be on the applicant. The applicant shall have three forms of proof. Some examples of proof of residency are: rent receipts, tax bill receipts, voter registration card, census list representation, and/or any other proof deemed acceptable by the Shellfish Committee. The applicant shall also possess a valid Massachusetts Commercial Shellfish License. The fee for commercial shellfish licenses shall be: 1. All Species-(Bay Scallop, Quahog, Oyster, Soft-Shelled Clam and Mussels) One hundred and fifty ($150.00) dollars. 2. Quahog/Mussels-Fifty ($50.00) dollars. 3. Bay Scallop-Seventy-five ($75.00) dollars. 4. Soft-Shell Clam-Fifty ($50.00) dollars. 5. Oyster-Seventy-five ($75.00) dollars. 6. Eel-Fifteen ($15.00) dollars. b. A FAMILY SHELLFISH LICENSE shall be valid for a family comprised of not more than licensee, spouse and children under eighteen (18) years of age. i. A RESIDENT FAMILY SHELLFISH LICENSE may be issued to the owner of real estate in the Town of Chilmark assessed for taxation at not less than ten thousand($10,000.00), or a dwelling house or to any permanent resident of the Town of Chilmark. Burden of proof of residency shall be on the applicant. The fee for a resident family shellfish license shall be twenty five ($25.00) dollars. The fee shall be waived for any resident senior citizen who has attained a minimum of seventy (70) years of age. ii. A NON-RESIDENT FAMILY SHELLFISH LICENSE may be issued to any person. The fee for a non-resident family shellfish license shall be fifty ($50.00) dollars. There shall be no fees waived. The fee for any non-resident senior citizen who has attained a minimum of seventy (70) years of age shall be twenty five ($25.00) dollars. There shall be no fees waived iii. A ONE (1) WEEK NON-RESIDENT FAMILY SHELLFISH LICENSE may be issued to any person, from May 1 through September 30. Each license shall be valid for a maximum of seven (7) days and no one (1) week non-	**1.10** All license fees are non-refundable. **4.0** COMMERCIAL SHELLFISH LICENSES - shall be issued to any permanent resident of Aquinnah 14 years of age or older. No commercial shellfish license may be granted to any person who has not resided in town for at least six (6) months preceding his/her application for a license. For a Bay Scallop license the residency requirement is 1 year. The burden of proof shall be on the applicant. The applicant shall have 12 consecutive months of three forms of proof. Some examples of proof of residency are: rent receipts and/or rent canceled checks, tax bill receipts, utility bills, census list representation, and/or any other proof deemed acceptable by the Shellfish Committee. The applicant shall also possess a valid Massachusetts Commercial Shellfish License. The fee for commercial shellfish licenses shall be: 1. Quahog/Soft shell-Sixty ($60.00) dollars. 2. Bay Scallop-Two hundred ($200.00) dollars. 3. Oyster-Seventy five ($75.00) dollars. **2.0** F AMI L Y SH E L L F ISH L IC ENSES - shall be valid for a family comprised of no more than licensee, spouse and children under eighteen (18) years of age and two guests. A) A RESIDENT F AMI L Y SH E L L F ISH L IC ENSE shall be issued to an owner of real estate in the Town of Aquinnah assessed for taxation at not less than ten thousand ($10,000.00) dollars, or a dwelling house or to any permanent resident of the Town of Aquinnah with at least six months residency. Burden of proof of residency shall be on the applicant. The fee for a resident family shellfish license shall be thirty ($30.00) dollars. The fee shall be waived for any resident senior citizen who has attained a minimum of seventy (70) years of age. B) A NON-RESIDENT F AMI L Y SH E L L F ISH L IC ENSE shall be issued to any person. The fee for a non-resident family shellfish license shall be fifty ($50.00) dollars. The fee for any non-resident senior citizen who has attained a minimum of seventy (70) years of age shall be twenty five ($25.00) dollars. There shall be no fees waived. C) ONE (1) WE E K NON-RESIDENT F AMI L Y SH E L L F ISH L IC ENSE shall be issued to any person, from May 1 through September 30. Each license shall be

resident shellfish license shall be valid after September 30. The issuance of the license allows the licensee to take up to one weekly limit of shellfish. The fee shall be twenty five ($25.00) dollars. There shall be no fee waived.	valid for a maximum of seven (7) days and no one (1) week non-resident shellfish license shall be valid after September 30. The issuance of the license allows the licensee to take up to one weekly limit of shellfish. The fee shall be twenty five ($25.00) dollars. There shall be no fee waived.
6. The waters of Chilmark are open for family shellfishing Sunday through Saturday from 7:00 a.m. to sunset or 7:00 p.m., whichever is earlier.	**1.4** No person shall dig, pile, take, or carry away shellfish by any method whatever from any waters, flats, or creeks between the time limits of one half hour after sunset and one half hour before sunrise.
7. A family shellfish licensee shall not fish more than once a week for any species of shellfish. A family shellfish licensee shall not take more than one quarter (1/4) bushel or (1) peck of any and all species of shellfish during said week, except the scallop and oyster limit shall be no more than one half (1/2) bushel or two (2) pecks per week, in season.	**2.1** Family and Non-Resident Licenses allow the taking of any kind of shellfish except scallops and oysters from the waters of Aquinnah. **2.2** Family and Non-Resident Licenses allow for the taking of no more than ½ a heaping bushel each of quahogs, clams or sea clams per week; the total catch not to exceed one (1) bushel per week.
	1.6 Shellfish shall be taken from Menemsha and Squibnocket Ponds only by methods commonly using a "bull rake", "digger", "tongs" or "clam hoe". Except for the taking of scallops, any use of mechanical power is prohibited unless an exception is recommended by the Shellfish Committee and approved by the Board of Selectmen.
8. A shellfish licensee may be allowed to dig one (1) additional family shellfish limit per week for another family licensee who is mentally and/or physically handicapped and/or suffering from an illness and/or is a senior citizen. A letter from the person for whom the shellfish will be collected must be submitted, at least annually, to the Shellfish Committee for approval/disapproval. The committee will then advise the Shellfish Constable, in writing, of the authorization. All shellfish for this permit shall be turned over to the absentee licensee for their consumption. Either or both permits may be revoked for a period of up to three hundred sixty five (365) days for just cause.	**1.7** No one shall possess soft clams less than two inches in length, oysters less than three inches in length and quahogs less than an inch in thickness. No one shall possess any seed shellfish unless they are an individual or group who hold a special permit from the State of Massachusetts to move seed under the supervision of the Shellfish Constable.
9. The licensee must have their valid shellfish license on their person while shellfishing, and must present said license to the Shellfish Constable or Deputy Shellfish Constable when directed to do so. The Shellfish Constable or Deputy Shellfish Constable may also require a photo identification to be presented	**2.4** The licensee must have their valid shellfish license on their person while shellfishing, and must present said license to the Shellfish Constable, Deputy Shellfish Constable or Police when directed to do so. The Town's Acting Authority may also require a photo identification to be presented.
10. No license for the taking of shellfish shall be granted to a minor under the age of sixteen (16). Any person holder of a commercial permit under the age of eighteen (18) years of age shall not fish during public school hours. Exceptions: Holidays and school vacations.	Note – in Aquinnah, the age is 14 and there is no fishing on Thanksgiving or Christmas holidays
11. a) All shellfish taken at Menemsha or Nashaquitsa Ponds shall be landed near the Quitsa Bridge, Menemsha Texaco or at a location designated by the Town Shellfish	

Constable or Deputy Shellfish Constable. All shellfish must be checked by the Shellfish Constable or Deputy Shellfish Constable before they are unloaded. b) All shellfish taken from any other waters of the Town must also be checked in and landed at a location designated by the Town Shellfish Constable or Deputy Shellfish Constable.	**1.9** All license holders must accompany their catch to shore. No license holder may come to shore with shellfish and then return to the water for the purpose of adding to their catch without the permission of the Constable or one of his deputies.
12. Transferring shellfish from one shellfish license to another is prohibited.	**1.3** Shellfish licenses are not transferable.
13. A bushel container must be a plastic "legal limit" bushel box. No other container used to hold a bushel of shellfish shall be allowed. These containers must be in good shape and not cracked, spread, stretched or any method used to increase their capacity. No artificial means shall be used to hold scallops on the baskets or boxes.	**2.3** A bushel container must be a plastic "legal limit" bushel box. No other container used to hold a bushel of shellfish shall be allowed. These containers must be in good shape and not be cracked, spread, stretched or any method used to increase their capacity. No artificial means shall be used to hold shellfish on the baskets or boxes.
14. It shall be unlawful to return any and all shellfish predators, such as starfish, conches, whelks, crabs, etc. to the water.	**1.8** No starfish, green crabs, whelks, moon snails or codium shall be returned to the water but placed upon the shore substantially above the water line at high tide.
15. Any person engaged or having engaged in shellfishing must immediately stop for and display all shellfish in their possession when directed to do so by the Shellfish Constable or a Deputy Shellfish Constable.	**1.5** Any person engaged or having engaged in shell fishing must immediately stop for and display all shellfish in their possession when directed to do so by the Shellfish Constable, Deputy Shellfish Constable or Police Officer.
16. All shellfish shall be measured before they are brought ashore and all seed shall be placed in deep water.	
17. A boat may only fish family shellfish licenses OR commercial shellfish licenses in any calendar day except under section 31 of these regulations. A boat may make only one (1) commercial trip per species per calendar day, Monday through Friday or on Saturday if the day qualifies under section 24 of these regulations.	ENFORCEMENT AND PENALTIES
18. a) No more than three (3) commercial shellfish licensees are allowed in a boat for commercial use. There shall be no more than three (3) commercial shellfish limits landed per boat per day. c) A maximum of three (3) family shellfish licensees are permitted in a boat for family shellfishing. d) When a commercial shellfishing boat comes ashore it is done (finished) for the day, except if there is an equipment failure that requires coming ashore. (also see exception in 19-e) e) Once a boat has begun to fish commercially it is prohibited from bringing aboard another commercial licensee at any time during that day, except upon prior agreement of the Shellfish Constable or Deputy Shellfish Constable on duty setting a time and location that the second licensee will be coming aboard, so the on duty Shellfish Constable or Deputy Shellfish Constable may verify that a single limit has not been exceeded.	**3.0** The Selectmen may suspend any license for such period of time as they deem proper if a determination is made at a notified selectmen's meeting that an infraction/violation of the above stated shellfish regulations has occurred. The selectmen may also impose a fine of not less than $10.00 nor more than $50.00 for each proven violation. The Selectmen must notify permit or license holders of such suspension or fine in writing. Anyone whose permit or license has been suspended shall surrender the same to the Shellfish Constable.

20. There shall be no shellfishing within the Town's jurisdiction on Thanksgiving and Christmas.	**4.1** The applicant shall complete a License Eligibility Application long form and submit it to the Shellfish Committee for its review together with any additional information or documentation requested by the Committee to demonstrate eligibility. The applicant shall have the burden of demonstrating eligibility to the satisfaction of the Committee. Upon receipt of a recommended application, the Board of Selectmen shall within seven (7) business days reach a decision with respect to the issuance of the license. Eligibility shall not exclude those applicants who are serving in the armed forces or who are pursuing degrees at institutions of higher learning.
21. The Shellfish Constable may close any area for the reason of protecting seed.	**4.2** The Board of Selectmen reserves the right to delay payment of the commercial scallop license fee if the resident declares in the application financial hardship. Payment will be due Friday at 4pm of the 1st week of scalloping.
SCUBA DIVING **22.** a) No commercial diving of any type is allowed in Menemsha or Nashaquitsa Pond. b) Only recreational diving, snorkeling or swimming will be allowed in Menemsha and Nashaquitsa Pond. c) Boats shall stay at least 100 feet from diver's flag. d) Anyone harvesting shellfish by swimming, snorkeling or scuba diving shall have a diver's flag.	**4.3** License holders who are attending island schools may not fish during the hours that school is in session.
	4.4 The Town of Aquinnah sets the following maximums for the daily catch by commercial license holders:
SCALLOPS	**SCALLOPS**
23. The hours for taking scallops by commercial fishermen shall be between 7:00 a.m. and 4:00 p.m. except Saturday and Sunday when the ponds are closed to all commercial shellfishing (see exception in section 25). All commercial shellfishermen must check in with the Shellfish Constable no later than 4:10 p.m.	**4.4.3** Per Shellfish Committee recommendation and Selectmen approval, the commercial limit shall be reviewed and established annually. The hours for taking scallops by commercial fishermen shall be between 7:00 a.m. and 4:00 p.m. except Saturday and Sunday when the ponds are closed to all commercial shellfishing (see exception in section 3.4.4). All commercial shellfishermen must check in with the Shellfish Constable no later than 4:10 p.m.
24. There shall be no dragging for scallops unless the air temperature reaches a minimum of thirty (30) degrees Fahrenheit, by no later than 10:00 a.m. on any calendar day.	**4.4.4** By 10:00 am on any given weekday, if a majority of fisherman present determine that weather conditions are too dangerous to fish, or the air temperature has not reached a minimum of thirty (30) degrees Fahrenheit, there shall be no dragging for scallops that calendar day. A red flag raised by the Shellfish Constable shall indicate the stoppage of commercial shell fishing.
25. If one or more days, Monday through Friday, fails to reach a minimum air temperature of thirty (30) degrees Fahrenheit by 10 a.m. then a commercial licensee may fish a commercial limit on Saturday of the same calendar week, if an air temperature of thirty (30) degrees Fahrenheit is reached by 10 a.m. There shall be no make-up day for any	If one or more days, Monday through Friday, fails to reach a minimum air temperature of thirty (30) degrees Fahrenheit by 10 a.m. then a commercial licensee may fish a commercial limit on Saturday of

other method of catching scallops. **26.** Scallop season opening/closing dates and limits, within the limits of Massachusetts General Law, Chapter 130, will be recommended by the Shellfish Committee and are contingent upon the approval of the Board of Selectmen.	the same calendar week, provided that the air temperature of thirty (30) degrees Fahrenheit is reached by 10 a.m. that Saturday. There shall be no make-up day for any other method of catching scallops. Scallop season opening/closing dates and limits, within the limits of Massachusetts General Law, Chapter 130, will be recommended by the Shellfish Committee and are contingent upon the approval of the Board of Selectmen.
27. a) No person shall take scallops other than adult scallops or offer for sale or have in his possession such scallops, unless licensed by the Massachusetts Division of Marine Fisheries to do so. Adult scallops shall be scallops with a well-defined, raised annual growth line (annuallus) at least ten (10) millimeters from the hinge of the shell and any scallop without such line shall be deemed a seed scallop. b) Exception. Bay Scallops that have a well-defined raised growth line located less than ten (10) millimeters from the hinge of the shell, shall be lawful to harvest and possess if the shell height is at least two and a half (2 ½) inches. c) The daily limit for the taking of scallops within the waters of Chilmark shall be set by the Chilmark Selectmen prior to opening the season annually or at any time during the season the Chilmark Selectmen may vote to change the daily limit.	**4.4.5** a) No person shall take scallops other than adult scallops or offer for sale or have in his possession such scallops, unless licensed by the Massachusetts Division of Marine Fisheries to do so. Adult scallops shall be scallops with a well-defined, raised annual growth line (annulus) at least ten (10) millimeters from the hinge of the shell and any scallop without such line shall be deemed a seed scallop. b) Exception. Bay Scallops that have a well-defined raised growth line located less than ten (10) millimeters from the hinge of the shell, shall be lawful to harvest and possess if the shell height is at least two and a half (2 ½) inches. c) The daily limit for the taking of scallops within the waters of Aquinnah shall be set by the Aquinnah Selectmen prior to opening the season annually or at any time during the season the Aquinnah Selectmen may vote to change the daily limit.
28. a) No boats used for the taking of scallops shall exceed twenty-two (22) feet in length at the water line. b) The use of more than six (6) drags is prohibited. c) The use of a drag exceeding thirty-six (36) inches in width is prohibited. d) The use of lead rollers or lead weights on the drags is prohibited. e) The use of teeth on a drag is prohibited. f) The use of chain sweeps exceeding one half (½) inches in thickness is prohibited. **29.** a) Loose scallops in boats are prohibited and shall be confiscated by the Shellfish Constable or Deputy Shellfish Constable. b) At the completion of a tow, the contents of the retrieved drag will be culled after being placed on the culling board to provide for minimal damage to the seed.	**4.4.6** Commercial Boat Regulations. a) No boats used for the taking of scallops shall exceed twenty- five (25) feet in length at the water line. b) A current Massachusetts Boat Registration is required. c) The use of more than six (6) drags is prohibited. d) The use of a drag exceeding thirty-six (36) inches in width is prohibited. e) The use of lead rollers or lead weights on the drags is prohibited. f) The use of teeth on a drag is prohibited. g) Loose scallops in boats are prohibited and shall be confiscated by the Shellfish Constable or Deputy Shellfish Constable. h) At the completion of a tow, the contents of the retrieved drag will be culled after being placed on the culling board to provide for minimal damage to the seed.

	4.4.10 There shall be no scuba diving for scallops in Menemsha Pond. **4.4.11** Scallop licensees are entitled to the following maximum quantities of shellfish: A. FAMILY: One (1) struck bushel per week; B. COMMERCIAL: Up to Eight (8) struck level; The amount to be determined annually by the Shellfish Committee and Board of Selectmen; C. NON - RESIDENT: One (1) struck bushel per week. **4.4.12** A holder of a family license who desires a commercial license, and is eligible, may pay for the commercial permit by surrendering the family permit and paying the difference in cost to the town.
30. Dragging shall be prohibited from the following areas: a) The area which the Selectmen designate as the seed area. b) The area designated by the Selectmen as the area for family licensees to dip net only. c) The Shellfish Constable may designate an area each scallop season for dip netting only and dragging will be prohibited. The area will be marked by buoys set out by the Shellfish Department personnel.	**4.4.7** Dragging shall be prohibited from the following areas: a) The area which the Shellfish Constable designates as the seed area. b) The Shellfish Constable may designate an area each scallop season for dip netting only and dragging will be prohibited. The area will be marked by buoys set out by the Shellfish Department personnel. (??)
31. Scallops that are washed ashore by storm conditions, within the boundaries of the Town of Chilmark, shall be harvested by the holder of a valid Chilmark Shellfish License only. No limit shall apply under these conditions at the discretion of the Shellfish Constable or Deputy Shellfish Constable on duty.	**4.4.8** Scallops that are washed ashore by storm conditions, within the boundaries of the Town of Aquinnah, shall be harvested by holder of a valid Aquinnah shellfish licensee only. No limit shall apply under these conditions at the discretion of the Shellfish Constable or Deputy Shellfish Constable on duty.
32. There shall be only Chilmark commercial shellfish licensees on a boat during commercial harvest except for the following conditions. Any person holding a residential family permit may be allowed to get his/her limit, for only one (1) calendar day of that week, aboard a boat fishing commercially if the Shellfish Constable or Deputy Shellfish Constable is notified prior to fishing.	**4.4.9** There shall be only Aquinnah commercial shellfish licenses on a boat during commercial harvest except for the fallowing conditions. Any person holding a residential family permit may be allowed to get his/her limit, for only one calendar day of that week, aboard a boat fishing commercially if the Shellfish Constable or Deputy Shellfish Constable is notified prior to fishing.
	4.4.13 No one shall remove any scallops on Thanksgiving Day and the following Friday, Christmas and New Year's Day
OYSTER	**OYSTER**
33. Oyster season opening/closing dates and limits, within the limits of Massachusetts General Law, Chapter 130, will be recommended by the Shellfish Committee and are contingent upon the approval of the Board of Selectmen	**4.4.12** Oyster season opening/closing dates and limits, within the limits of Massachusetts General Law, Chapter 130, will be recommended by the Shellfish Committee and are contingent upon the approval of the Board of Selectmen. The minimum size for oysters shall be three (3) inches longest shell measurement.

34. The minimum size for oysters shall be three (3) inches longest shell measurement. **35.** The maximum limit for recreational harvest shall be not more than one half (1/2) bushel per calendar week per shellfish license.	**4.4.13** The maximum limit for recreational harvest shall be not more than one half (1/2) bushel per calendar week per shellfish license. The Shellfish Constable may close any area for the reason of protecting seed.
QUAHOGS	**QUAHOGS**
36. The daily limit for commercial licenses shall be four (4) struck bushels, not more than two (2) bushel of necks and two (2) bushel consisting of either cherrystones or chowders.	**4.4.1** The daily limit for commercial licenses shall be eight (8) struck bushels, of which no more than two (2) bushels may be Little Necks.
37. It is unlawful to take any quahog that does not measure one (1) inch in thickness (hinge height). A gauge must be carried while quahoging. **38.** The hours for commercial quahoging shall be from 7:00 a.m. - 4:00 p.m. from November 1st to March 31st, and from 7:00 a.m. to 5:00 p.m. from April 1st to October 31st, Monday through Friday.	It is unlawful to take any quahog that does not measure one (1) inch in thickness (hinge height). A gauge must be carried while quahoging. The hours for commercial quahoging shall be from 7:00 a.m. - 4:00 p.m. from November 1st to March 31st, and from 7:00 a.m. to 5:00 p.m. from April 1st to October 31st, Monday through Friday.
39. Power dredging for quahogs is permitted only in coastal waters of the town outside the ponds, during the dates set by the Selectmen. The maximum length of a boat used for power dredging shall be thirty (30) feet at the waterline. Not more than twenty five (25) bushels shall be harvested per calendar day.	
SOFT SHELLED CLAMS	**SOFT SHELLED CLAMS**
40. The minimum legal size shall be two (2) inches at the longest shell measurement. A two (2) inch ring must be carried while clamming. **41.** The commercial limit shall be no more than two (2) bushel per day, Monday through Friday. **42.** Commercial clamming shall be limited to the same hours as commercial quahoging. **43.** Jetting of clams is prohibited unless approved by the Chilmark Shellfish Committee.	**4.4.2** The commercial limit shall be no more than two (2) bushel per day, Monday through Friday. The minimum legal size shall be two (2) inches at the longest shell measurement. A two (2) inch ring must be carried while clamming. Commercial clamming shall be limited to the same hours as commercial quahoging. Jetting of clams is prohibited.
MUSSELS	**MUSSELS**
54. The commercial limit shall be no more than ten (10) bushel per day, Monday through Friday. **55.** The hours for commercial Musseling shall be from 7:00 a.m. - 4:00 p.m. year round.	**4.4.14** The commercial limit shall be no more than ten (10) bushel per day, Monday through Friday. The hours for commercial musseling shall be from 7:00 a.m. - 4:00 p.m. year round.
AQUACULTURE GRANTS/LEESES	**COMMERCIAL LICENSE PENALTIES**
44. Licenses will be granted by the Board of Selectmen for cultivation of indigenous shellfish species only: Soft-Shelled Clams, Hard-shelled Clams, Bay Scallops, American Oysters, Blue and Ribbed Mussels. **45.** Licenses will be granted only to individuals who are permanent full time residents of Chilmark and are non-transferable.	**5.0** Any person having such commercial license (and acceptance of said license shall constitute agreement) for the taking of shellfish and who violates any laws of the Commonwealth or any regulations made by the Aquinnah Selectmen relating to shellfish or shell fishing in Aquinnah

46. Licenses will be granted for a period of one (1) year. At the end of each year the licensee may apply for renewal. Proof of the use of the license is required for renewal. The Shellfish Constable shall determine active use of the license. **47.** The total licensed area in each pond or bay will be limited to ten percent (10%) of the acreage of that pond or bay. **48.** Floating licenses may be granted in ponds and bays and in outside waters: one quarter (1/4) acre maximum in ponds and bays, twenty five (25) acre maximum in outside waters. Only one (1) such license will be granted to any one individual. **49.** Bottom licenses will be granted for ponds and bays not more than one (1) acre. Only one (1) such license will be granted to any one individual. **50.** Any bay scallops within a bottom licensed area belong to the public. Dip netting is the only method permitted for taking such scallops. **51.** The Chilmark Board of Selectmen will set the annual fee for Aquaculture Licenses. The annual fee will be not less than five ($5.00) dollars and not more than twenty five ($25.00) dollars. **52.** Any variation to this Aquaculture Policy shall first be approved by the Chilmark Board of Selectmen. **53.** Upon approval of a license, the Applicant must submit a Business Plan to the Chilmark Board of Selectmen. The Board may, at its sole discretion, require that an escrow account be established by the applicant.	shall be subject to the following penalties: • First offense - Violators of these regulations shall be fined one hundred dollars ($100.00) and Shall forfeit the day's catch; • Second offense - Violators of these regulations must appear before the Board of Selectmen. Said Board at a fair and open hearing may, upon recommendation of the Shellfish Constable or Deputy Shellfish Constable and at the Board's sole discretion, suspend such license for a period of one week (five fishable days) and shall forfeit that day's catch; • Third offense - Violators of these regulations must appear before the Board of Selectmen. Said Board at a fair and open hearing may, upon recommendation of the Shellfish Constable or Deputy Shellfish Constable and depending on the severity of the offense suspend such license for a period from one fishable month to one fishable year at the Board's sole discretion and shall forfeit that day's catch. If a license suspension carries beyond the close of the season of the species being harvested, the balance of the suspension remaining shall be carried over to that species next season. If there are no subsequent offenses during a three (3) year period starting with the date of the last offense, the individual will be considered to have a clean slate.