

**Formulating a More Effective Management System for
Shellfish Production and Nitrogen Remediation**

**A Report Prepared for the
Cape Cod Economic Development Council**

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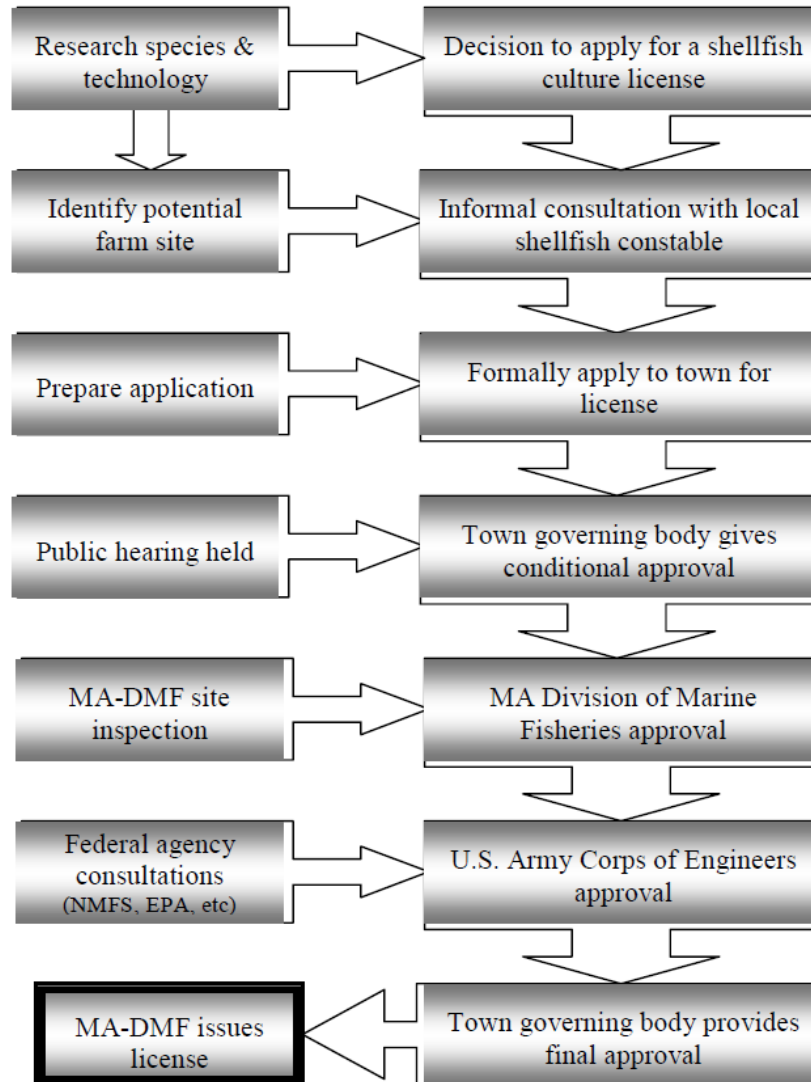
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Executive Summary

In Massachusetts as in other states, shellfish aquaculture is conducted on specific grow-out sites leased to an individual with a commercial shell fishing license under a shellfish aquaculture permit. The permitting process requires approval from multiple regulatory groups at each government level. **Table 1** illustrates this multi-step process ([Best Management Practices for the Shellfish Culture Industry in Southeastern Massachusetts - version 09-04a](#)).

Table 1: an overview of the general procedure for acquiring a shellfish aquaculture license in Massachusetts.



These regulations were developed considering shellfish farming as a private enterprise utilizing public marine lands solely for personal gain. For this reason the shell fishing industry incurs

higher scrutiny at the regulatory level and remains lower in priority than other uses of the public coastal zone.

Conversely, it has been shown that shellfish farming provides various benefits to the community as a whole, economically and environmentally. In the 2015 Information Guide for Shellfish growers, Samuel D. Rauch, Assistant Administrator for NOAA Fisheries wrote “Shellfish aquaculture provides a source of seafood for growing demand, creates coastal jobs and business opportunities, builds habitat for important commercial and recreational species, restores native populations, protects shorelines, and provides ecosystem services such as improvement of water quality”. Furthermore, research has also presented the industry as a possible solution to the nitrogen loading issues occurring in the majority of estuaries. Shellfish aquaculture clearly supports important public functions that can benefit regions at the communal level, however, the current permitting process is a tangled web between federal and state regulations. This overlap in regulations creates excessive permitting requirements that confuse current and potential growers, limiting growth of the industry.

Re-structuring regulations to eliminate repetition between government requirements by creating a more comprehensive and streamlined permitting process could remedy these issues. After careful review of current shellfish aquaculture regulations at each government level this report was created to identify the issues affecting growth of the industry federally and locally in Cape Cod, Massachusetts. Utilizing this information a set of model ordinances are proposed to create a streamlined regulatory and management system that will promote the expansion of sustainable, safe and ecologically sound shellfish aquaculture.

Introduction

Aquaculture in the United States is a rapidly growing industry that provides both economic and environmental benefits. Congress acknowledged the positive impact aquaculture has on the economy and environment by passing the National Aquaculture Act of 1980 to “encourage the development of aquaculture in the United States.”¹ In June 2014, the National Science and Technology Council issued the National Strategic Plan for Federal Aquaculture Research to further encourage and build an industry that “increases seafood availability, jobs, economic opportunities . . . while providing for the restoration and promotion of healthy aquatic ecosystems.”²

The National Science and Technology Council has established that aquaculture restores and enhances endangered or depleted fish species, provides shoreline protection, and addresses water quality concerns.³ For that reason, bivalve shellfish aquaculture has been referred to as a “green

¹ 16 U.S.C § 2801 (2014).

² National Science and Technology Council Committee on Science Interagency Working Group on Aquaculture, National Strategic Plan for Federal Aquaculture Research 3 (2014-2019) [hereinafter Working Group on Aquaculture].

³ Id at 5

industry.”⁴ Accordingly, it is well known that shellfish farmers are passionate about their product and are therefore dedicated to maintaining good water quality.⁵

Bivalve mollusks are filter feeders and remove excess nutrients from the water hence improving water quality during the feeding process.⁶ For example, the nitrogen absorbed by an oyster is stored in its tissues and when the oyster is harvested the nitrogen is removed from water.⁷ In fact, harvesting about 72 oysters a week can remove the excess nitrogen waste expelled by one person.⁸ Also, filter feeding shellfish improve water clarity, which increases light penetration and promotes the growth of eel grass a critical nursery habitat for various shellfish and finfish.⁹

Multiple research projects have been conducted to ascertain the full environmental benefits of oyster culture. The following link provides the most current draft of an on-going project using oysters to mitigate nitrogen loading in Little Pond an estuary located in Falmouth, MA. [Little Pond Yr 2 Oyster Monitoring Rpt Revised DRAFT.pdf](#)

According to the National Strategic Plan, in 2012 the United States was in the top three seafood markets worldwide, with consumers spending nearly \$82.6 billion.¹⁰ Unfortunately, the value of seafood products derived from United States aquaculture was a minuscule \$1.3 billion, compared to the total amount spent.¹¹ One way to close the gap between these numbers would be to streamline the permitting process for shellfish aquaculture to help encourage its development across the United States.

Currently, acquiring an aquaculture permit is a lengthy, complex, and often frustrating task. The Aquaculture White Paper & Strategic Plan asserts the aquaculture industry “faces an uncoordinated, and at times overlapping,” permitting process.¹² The complexity of shellfish aquaculture rests in the fact that submerged lands are managed as a public entity rather than private property as in land based agriculture. Marine land leased by an individual for shellfish aquaculture is therefore seen as use of a public lands for private business purposes hence incurring additional scrutiny at all government levels.

In general shellfish aquaculture permitting is a three tier process including various permits, leases and licenses administered at the federal, state and local government level. The table below

⁴ Sandra E. Shumway et al., *Shellfish Aquaculture: In Praise of Sustainable Economies and Environments*, 34 *World Aquaculture* 15, 15-19 (2003).

⁵ *Id.*

⁶ *Id.* at 16.

⁷ Environmental Impact, *supra* note 7.

⁸ W. Wilcox, Water Resource Planner, *Shellfish as a Means to Reduce Nitrogen Impacts in Coastal Waters*, 2 (2009) (citing Robert Rheault, *Environmental Impact and Ecosystem Services Provided by Oyster Aquaculture*, Aquaculture Power Point Presentation, www.powershow.com/view1/27dc7a-ZDc1Z/Environmental_Impact_and_Ecosystem_Services_Provided_by_Oyster_Aquaculture_powerpoint_ppt_presentation). [hereinafter Environmental Impact].

⁹ *Id.*

¹⁰ Working Group on Aquaculture, *supra* note 2, at 1.

¹¹ *Id.*

¹² Massachusetts Coastal Zone Management Office, Executive Office of Environmental Affairs, *Aquaculture White Paper & Strategic Plan* 17 (1995) [hereinafter White Paper].

created by the Interagency Working Group on Aquaculture summarizes the main types of authorization required for commercial shellfish farming in the U.S.

BOX 1 - Main Types of Authorizations Required for Commercial Shellfish Farming	
Lease	You need legal permission to put your farm in public waters of the United States. Usually, but not in all cases, this will be in the form of a lease from the agency that is responsible for managing submerged lands in your state. Note, however, that in some locations, submerged lands are managed by a local jurisdiction (county, city, town, harbor district, etc.), or belong to a tribe or private individuals.
State/local permit(s)	In most cases, you will need to obtain a permit or other type of authorization from the agency responsible for aquaculture in your state (not always the same agency that issues leases). There may be additional state permitting requirements as well. Depending on your location, you may also need to obtain additional permits or authorizations from local authorities in the county, town, or other jurisdiction where your farm is located.
Federal permit(s)	In most cases, you will need to obtain a permit from your District Office of the U.S. Army Corps of Engineers (Corps), which regulates activities in waters of the United States. The evaluation process may require project-specific consultation with other federal agencies and tribes, and/or coordination with other agencies and the public. Some specific locations or types of operations may require additional federal permits

The majority of regulatory oversight in shellfish aquaculture is conducted by the state government and in some states additional leasing authority is given to local jurisdictions. **Appendix A** provides a summary of the aquaculture permitting process for each state along the Atlantic coast. Federally the U.S. Army Corps of Engineers is the main administrator of shellfish aquaculture permits, although, the U.S. Fish and Wildlife Service and the National Marine Fisheries Service can also impose permit requirements when leases contain threatened or

endangered species, essential fish habitat or migratory birds. **Appendix B** defines the more than one dozen federal statutes and regulations affecting aquaculture. Furthermore, the regulatory framework regarding all human health aspects of farmed shellfish is established by the Interstate Shellfish Sanitation Conference (ISSC), an industry-state-federal partnership that implements the National Shellfish Sanitation Program (NSSP).

It is this diversity in the regulatory structure between federal, state and local regulations that creates confusion and makes it impossible to develop a comprehensive set of operational guidelines for the entire shellfishing industry. This report was developed in an effort to remedy this issue by summarizing the issues due to current regulations and presenting new model ordinances that would streamline the regulatory process. Due to the overwhelming diversity of regulations we chose to focus on the development of oyster aquaculture in Cape Cod, Massachusetts as an example for regulatory reform.

Shellfish Aquaculture in Massachusetts

According to the Massachusetts Division of Marine Fisheries Shellfish Planting Guidelines updated in September 2014, Massachusetts has 303 defined shellfish growing areas (SGA) that cover 1.7 million acres. The Massachusetts Office of Environmental Law Enforcement (OLE) works with municipal shellfish constables to enforce the state statutes and regulations that govern this resource. This partnership between the state and municipalities in MA differs from other east coast states where management of shellfish is controlled solely by the state.

Shellfish farming (on and off bottom) is licensed by the local municipality. The Division of Marine Fisheries (Marine Fisheries) issues a propagation or aquaculture permit. Permits are awarded to individuals either to propagate shellfish, i.e. possess and cultivate sub-legal size shellfish while marketing only legal size shellfish (referred to as a Propagation Permit), or to aquaculture shellfish, i.e. possess, grow and market sub-legal (seed) and legal size shellfish (referred to as an Aquaculture Permit). The U.S. Army Corps of Engineers requirements are contained in a General Programmatic Permit for an area more than two acres in size and an Appendix C: Category 1 Form for areas less than two acres. Due to Massachusetts "home rule", where towns set their own regulations/requirements for aquaculture licensing, each municipality may vary somewhat from this generalized scenario, excluding the permits issued by Division of Marine Fisheries and the U.S. Army Corps of Engineers.

State statute (MGL Chapter 130 section 57) authorizes municipalities (city council, mayor or town selectmen) to issue a renewable and transferable license that allows the holder to: 1) to plant and grow shellfish, bottom/off bottom culture; 2) to place shellfish in or under protective devices affixed directly to the tidal flats or land under coastal waters, such as boxes, trays, pens, bags, or nets; 3) to harvest and take legal shellfish; 4) to plant cultch for the purpose of catching shellfish seed; and 5) to grow shellfish by means of racks, rafts or floats.

The license may be issued with a 10 year term with an annual fee of \$5 to \$25 per acre for

up to 25 acres. The authorizing statutes are available here:

<https://malegislature.gov/Laws/GeneralLaws/PartI/TitleXIX/Chapter130/Section57---68>.

An in-depth regulatory description is provided in a publication entitled, *Best Management Practices for the Shellfish Culture Industry in Southeastern Massachusetts*, and available here: <http://www.mass.gov/eea/docs/agr/aquaculture/shellfish---bmps---v09---04a.pdf>.

The SGAs in MA are further broken down according to five NSSP classifications:

1. **Approved**: Open to the harvest of shellfish for direct human consumption subject to local rules and regulations and only closed during major coast wide events (e.g. an oil spill or red tide event).
2. **Conditionally Approved**: Closed some of the time to rainfall or seasonally poor water quality or other predictable events. When open, it is treated as an Approved area.
3. **Restricted**: Contains a limited degree of contamination at all times. This classification is used for areas where shellfish can be relayed to a less contaminated area or harvested for depuration.
4. **Conditionally Restricted**: Contains a limited degree of contamination at all times, subject to intermittent pollution events and may be closed some of the time to rainfall or seasonally poor water quality. In Massachusetts, when open, only softshell clams may be harvested by Master/Subordinate Diggers for depuration at the Marine Fisheries Shellfish Purification Plant.
5. **Prohibited**: Area closed to the harvest of shellfish under all conditions, except the gathering of seed for municipal propagation programs under Marine Fisheries transplant permits.

Massachusetts utilizes all five classifications. Any SGA not in the Approved classification is considered contaminated. Formal classification definitions can be found in Section 2, Chapter 4.03 of the NSSP Guide for the Control of Molluscan Shellfish (U.S. FDA 2009).

Each shellfish classification area within an SGA is also assigned a status. The status of an SGA or classification area is separate and distinct from its classification and may be opened, closed or inactive for the harvesting of shellfish.

Massachusetts utilizes two NSSP status designations:

1. **Open Status**: Except for an area in the prohibited classification, any growing area is normally open for the purposes of harvesting shellfish subject to the limitations of its classification.
2. **Closed Status**: Any classified growing area may be closed for a limited or temporary period because of an emergency situation, biotoxins, conditions stipulated in a management plan of a conditionally classified area or failure of the state to complete NSSP classification and monitoring requirements. Any area in the closed status is considered contaminated.

A more detailed summary of Massachusetts aquaculture regulations can be found in **Appendix C**. Additionally **Appendix D** summarizes the current shellfish aquaculture permitting process in Falmouth, MA as a more detailed example of the complexity of the permitting process.

Aquaculture Permitting Issues

Shellfish aquaculture involves three primary stages: 1) production of shellfish seed 2) growth of seed to juveniles in a nursery environment and 3) grow-out of juveniles to marketable size for harvest and commercial sale. Currently in Massachusetts shellfish seed is produced by less than ten shellfish seed hatcheries approved by Marine Fisheries. This seed is then propagated or planted by the municipality to increase the public shellfishery or utilized for private aquaculture production in which the seed is planted and raised at a privately licensed location resulting in commercial production of shellfish.

This separation between municipal and private shellfish production occurs due to their distinct permit authorizations and limitations. Massachusetts municipalities have the ability to gather seed, propagate, and/or relay shellfish from restricted and conditionally restricted areas to support depuration fisheries. Municipalities may conduct propagation efforts with city or town personnel, volunteers other organizations or institutions as deemed appropriate by the selectmen or city council. Non-municipal entities would be covered by the municipal propagation permit as local agents. However, municipalities are not permitted to commercially sell shellfish. Conversely, individual shellfish permit holders are not permitted to gather seed or relay shellfish from unapproved areas but are allowed to commercially sell their product.

In an effort to utilize all shellfish growing areas as well as improve water quality coastal cities and towns may extend their G.L. c. 130 §52 authority to such areas determined to be contaminated provided that a shellfish management plan has been developed and adopted by the city or town with the assistance and approval of Marine Fisheries. However, ultimately, the shellfish must be utilized in the public shellfisheries. Historically, cities and towns have not opted to use this provision of the statute due to the added responsibilities incurred to prevent illegal harvest and diversion of contaminated shellfish into commerce.

A municipality may allow shellfish planting by private citizens or private property owners in contaminated waters per item 2.c. of the Allowable Shellfish Planting Practices, under a management plan approved by Marine Fisheries. This activity is conditioned by Marine Fisheries on the municipal propagation permit. As with municipal use of contaminated waters the shellfish produced are solely used to augment the public fishery.

In summary coastal cities and towns have no authority to license private aquaculture in contaminated waters but may propagate shellfish in these areas to support the public fishery. These restrictions impede the expansion of aquaculture as a water quality measure and provide limited economic incentives for towns to propagate their public fishery in contaminated waters.

Model Ordinances

To expand shellfish aquaculture in an effort to improve water quality and utilize all available SGAs the following model ordinances can be applied to create a functional shellfish management plan that includes a contaminated area management plan for individual municipalities in Cape Cod. The overall management process will utilize a type of block

permitting where the municipality applies for the necessary state and federal aquaculture permits, then subdivides and licenses the sites to individuals at their discretion.¹³

Under the model ordinances municipalities will be provided options for the three primary stages of shellfish aquaculture: seed production, growth to juvenile size, and grow-out to marketable size. These options will include contractual and lease agreements awarded through bidding or lottery systems that utilize municipal permits and receive direct oversight by the municipality. To maintain economic viability a share of the commercial profit made will be given back to the town in the form of monies or shellfish for the public fishery.

Seed production options:

- 1) Municipalities own their own hatcheries and provide seed with aquaculture site leases.
- 2) Municipalities contract out seed production to a private company that meets Marine Fisheries standards.
- 3) Municipalities contract out the collection, relay and propagation of seed from contaminated areas using an approved management plan under their municipal propagation permit.

Growth to juvenile size options:

- 1) Municipalities own and manage the upwellers.
- 2) Municipalities own upwellers but contract out their management.
- 3) Upwellers are privately owned and permitted.

Grow-out to marketable size options:

- 1) Municipalities lease SGAs to individuals under a block permit on an annual, 2, 5, 10, or 15 year basis.
- 2) Leases can be granted using a bidding or lottery system.
- 3) Leases can be rotated by area and reviewed on a yearly basis.
- 4) Seed can be provided by the municipality or bought from an approved private hatchery.
- 5) Equipment such as racks, rafts, and floats can be provided by the municipality along with the lease or bought by the lessee.
- 6) Municipalities can lease SGAs in restricted or conditionally restricted areas for propagation of shellfish that will eventually be moved to an area for depuration prior to harvesting for market sale.
- 7) Culture area under floating bags or raised racks closed to shell fishing for one or up to three years and seeded with clams for subsequent harvest by recreational and/or commercial fishers when reopened. Temporary area closures to shellfishing by municipalities are a common management practice and allowed under Massachusetts Shellfish Planting Guidelines (<http://www.mass.gov/eea/docs/dfg/dmf/programsandprojects/shellfish-planting-guidelines.pdf>) under Item 1 of the section on Allowable Shellfish Planting Practices “Planting may be conducted in marine waters with an NSSP classification of Approved or Conditionally Approved. Pursuant to G.L. c. 130 § 54, municipalities are limited to closing planted areas for periods not to exceed three years, whereas, pursuant to G.L. c.

¹³ Massachusetts Shellfish Growers, Southeastern Massachusetts Aquaculture Center, Best Management Practices for the Shellfish Culture Industry in Southeastern Massachusetts 1 (2010).

130 § 20, Marine Fisheries may close a planted area on a more permanent basis by regulation subject to public review and comment.”

Recommendations

We suggest promoting the implementation of a Rotational Resource Enhancement Strategy to maximize the environmental and economic benefits of aquaculture in Cape Cod estuaries. A revitalized ARC facility can support this expanded program. In addition, implementing a rotational strategy will allow the public to utilize areas for shellfishing that would normally be prohibited under a traditional aquaculture system per state Shellfish Planting Guidelines. The rotational strategy would allow areas to be planted one year, closed to shellfishing and used for aquaculture that year. The following year, that area would be open to shellfishing; and the aquaculture would be conducted in an adjacent area defined in the contractual agreement between the grower and the municipality with the same shellfish planting and closed fishing condition for that year. The following year (third), the aquaculture and bottom planting practice would return to the original area. Finally, an efficient permitting process will draw aquaculture applicants, thus increasing revenues and utilize aquaculture as a means to enhance water quality.

First, either existing or new Municipal Shellfish Commissions will select areas to conduct oyster aquaculture and obtain the necessary state and federal permits in turn providing the basis for block permitting of the resource. As a result, the Commissions will gain greater control over where growing areas are located, which reduces conflicting uses of the area, and encourages applicants with a streamlined permit process. Second, approximately half of the selected areas will be leased out to qualified applicants to grow oysters in floating cages. Furthermore, the towns will seed the area below the cages with quahogs. Fortunately, as noted above, the state allows temporary closing of harvested areas for shellfish seeding and growth for subsequent harvest. Aquaculture could also be temporarily conducted in that area during the period closed to shellfishing. Thus, the quahogs are given the opportunity to grow to legal, harvestable size while they and the oysters clean the water by removing excess nutrients. Third, after a growing season, the lessee will move the floating cages to one of the other open, pre-determined sites and again the town will seed the area below the floating gear with quahogs. The previously quahog-seeded site will become open to the public for harvesting. Accordingly, the new site will closed to the public to allow the quahog seed to grow, the aquaculturist to profit, and the water quality to improve.¹⁴ Hence, implementing a rotational strategy will allow the municipality to increase revenue, preserve water quality, and support public aquaculture areas.

The rotational concept for aquaculture is consistent with the state’s allowing areas to be closed on a single or up to three year basis for shellfish planting purposes and subsequent harvest. The aquaculture would be defined in and conducted via contractual licenses to private growers from municipalities under the municipality’s propagation and/or aquaculture permit from the state and its management plan per G.L. c.130 § 52. The licenses could specify what are could be used from year-to-year.

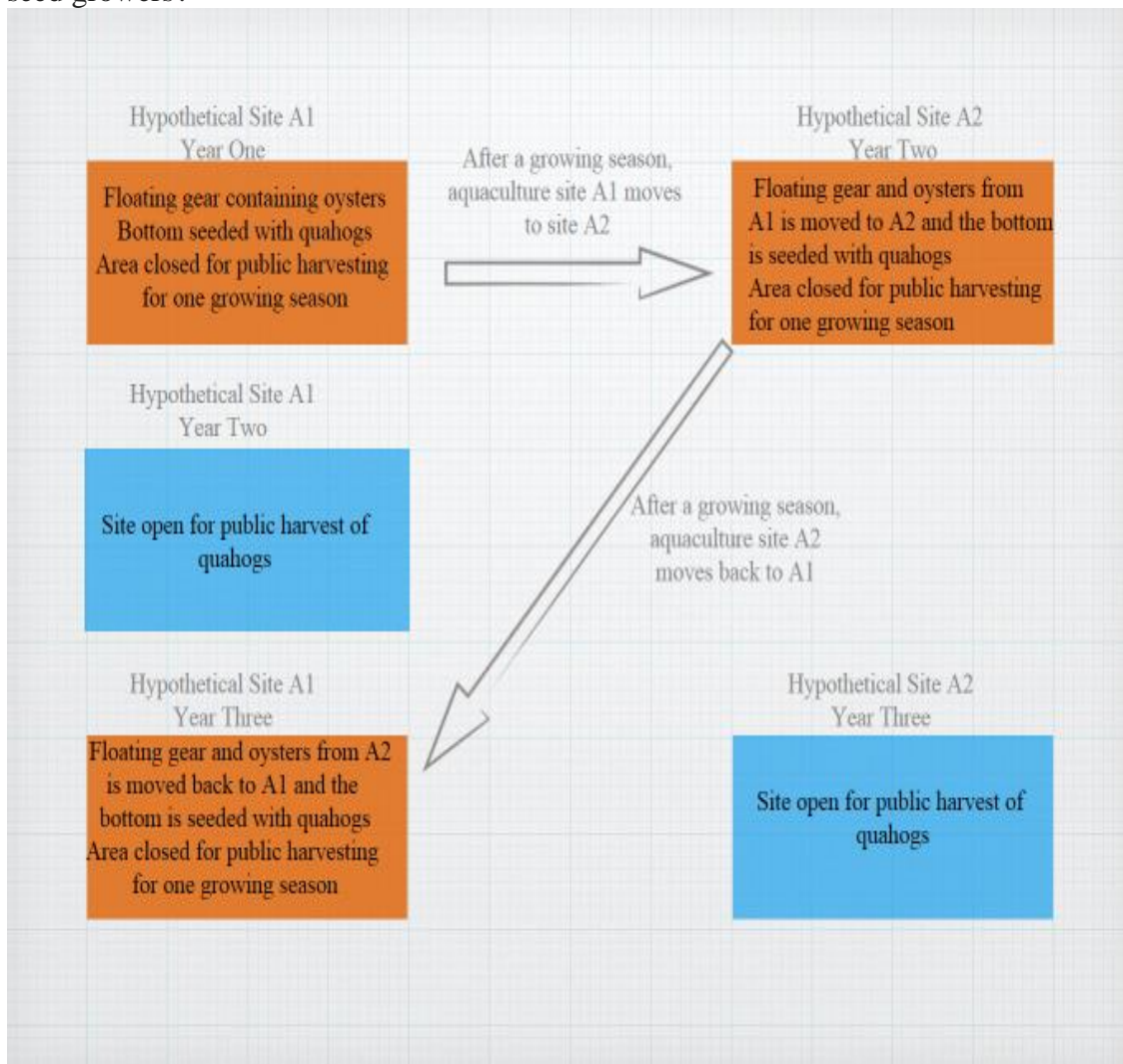
Under A Special Project Permit per 322 CMR § 7.01(4)(d), an individual can also relay shellfish. Thus for a shellfish seed producer – no more than 2-inch size – in contaminated waters, that

¹⁴ See Diagram1

producer with a Special Project Permit could relay shellfish to areas appropriate for depuration and grow-out. Specific to contaminated waters there are issues that need to be further flushed out such as the following:

Planting Guidelines Issue 1 -- Waters Under Municipal Control -- If a municipality wants to grow shellfish to improve water quality and eventually transplant or relay shellfish to remove the nitrogen from contaminated waters, the municipality may assume control of a specific contaminated water body or portion of the contaminated waters within its municipal boundaries under a management plan (G.L. c.130 § 52). Ultimately, the shellfish must be utilized in the public shellfisheries. Ultimately, the shellfish must be utilized in the public shellfisheries. This needs to be changed to allow private grow-out via aquaculture.

Planting Guidelines Issue 2 -- Under authority of G.L. c.130 §§17B, 69, 75, 80 and 83, municipalities may take, possess, relay and transplant contaminated shellfish for propagation and natural purification subject to written conditions established by the Marine Fisheries Director and subject to the requirements of the NSSP. Does this limit relay from contaminated waters to municipalities or can municipalities include this action (following state guidelines) to individual seed growers?



Acknowledgements

Quite a few state agency representatives and shellfish farmers, known or unknown to me, reviewed and commented on an earlier draft that was posted to the East Coast Shellfish Growers Association' listserv on January 24th. Individuals and agency programs then stepped up to review state summaries that were re---drafted and reviewed, in some cases, several times. At considerable risk of forgetting someone, my great appreciation is extended to the following individuals for providing comments and information, rewriting drafts, or reviewing and commenting on additional rewrites: Jim Arnoux, Russ Babb, Dave Beutel, Thomas Bliss, Wade Carden, Brian Conrad, John Dunne, John Ewart, Susan Filipowich, Tess Getchis, Nancy Hadley, Jerry Moles, Chris Philips, Monique Purcell, Diantha Robinson, Thomas Shields, Bruce Smith, Ben Stagg, Rebecca Thur, Don Webster, and Douglas Winter.

Appendix A. U.S. Atlantic Coast State Shellfish Aquaculture Permitting Information
Prepared by Paul Zajicek Division of Aquaculture
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Each Atlantic coastal state has developed distinct laws, rules, policies or programs governing leasing, licensing, or permitting of sovereign submerged lands for shellfish (oyster, clam, or mussel) culture. In addition to errors associated with interpreting state programs and summarizing complex programs, state laws, regulations and programs change frequently. This summary was completed on January 30, 2014 and readers are advised to contact the lead state agency for current information. State summaries are presented from north (Maine) to south (Florida) for the Atlantic Coast.

All states examine the proposed activities and location for potential conflicts with or impacts on other users (e.g., navigation, fishing, recreation, and littoral access), natural resources (e.g., submerged aquatic vegetation, species listed under the Endangered Species Act, shellfish or fish stocks, and live hard bottom) and the chemo---physical characteristics of the site (e.g., sediment, water quality, currents). Applicants may have to survey and describe potential conflicts or impacts and/or a state agency(ies) examines a production plan and conducts a site inspection. In all instances, the public is notified and invited to comment on the proposed shellfish farm.

Creating a structure and dredging and filling in U.S. navigable waters triggers permits from the U.S. Army Corps of Engineers and U.S. Coast Guard. Certain states and U.S. Army Corps of Engineers developed programmatic general permits, and as noted in the narrative, if the activity proposed by the shellfish farmer is allowable under a programmatic general permit held by a state, then the U.S. Army Corps of Engineers will issue an approval letter or the restrictions imposed by the state will satisfy the programmatic general permit. Relative to navigation, most states inform an off---bottom oyster farmer that they must acquire a permit from the U.S. Coast Guard for Private Aids to Navigation to warn mariners not to enter a marked area because of the navigational hazard posed by floating or submerged culture gear; however, one state does not allow the use of production gear that will create a navigational hazard and another state requires that an application for Private Aids to Navigation be submitted to a state agency so that the agency will inform the U.S. Coast Guard.

Shellfish production and distribution intended for human consumption is governed by the National Shellfish Sanitation Program (<http://www.fda.gov/food/guidanceregulation/federalstatefoodprograms/ucm2006754.htm>). These requirements are implemented by all of the coastal states to govern lease placement in approved or conditionally approved waters and the processes associated with shellfish harvesting, handling, and sale.

Maine

The **Department of Marine Resources** authority encompasses the ability to lease state submerged lands. They offer a license and two different leases:

A Limited--Purpose Aquaculture license is renewable annually for up to 400 square feet for designated types of gear to culture certain species of shellfish, algae, or sea urchins in a single location. The application fee is \$50. There is a limit of four licenses per person. The applicant must provide: 1) a coordinate for the center of the license site, 2) a brief site description including whether there are eelgrass beds present nearby, 3) site plan and gear description, 4) description of commercial and recreational fishing that includes type, duration and amount of activity, 5) list riparian landowners, and 6) a signed statement by a harbormaster or municipal officer that the license activities will not impede safe navigation, will not unreasonably interfere with commercial or recreation fishing and will not unreasonably interfere with riparian ingress or egress. The applicant must also notify riparian owners within 300 feet of the site by providing a copy of the application and information about how the landowners can submit comments to the department.

An “experimental” lease is non---renewable, 3---year lease for up to four acres. The application fee is \$100. Rent is \$100 per acre per year. The applicant must provide: 1) location description with corner coordinates, map of the lease area and adjoining waters and shorelines, 2) list of riparian landowners, 3) description of research of development study to be conducted, 4) description of the degree of exclusive use of the site, 5) description of existing uses of the proposed lease (commercial and recreational fishing activity, moorings, navigation and navigational channels, use of the area by riparian landowners), 6) written permission from every riparian landowner, and 7) general description of major physical and biological characteristics as well as general shoreline and upland characteristics. A public hearing may be held at the agency’s option; a hearing is mandatory if requested by five or more people. Performance bonds are required, similar to those for standard leases (below). Annual reports of seeding and harvesting and research reports are required.

A standard lease is renewable at 10 year increments, applicable for up to 100 acres, and includes a rent of \$100 per acre per year. The application fee is \$1,500. An applicant must provide: 1) location description with corner coordinates, map of the lease area and adjoining waters and shorelines, 2) list riparian landowners that are within 1,000 feet of the site, 3) species to be cultivated, 4) an environmental characterization describing bottom characteristics, resident flora and fauna, tide levels, and current speed and direction, 5) commercial and recreational navigation use that includes type, volume, time, duration, location and direction of traffic, 6) description of the degree of exclusive use of the site, 7) commercial and recreational fishing that includes type, duration and amount of activity, 8) written permission from every riparian landowner, 9) financial capacity to obtain, operate and maintain the activities, 10) technical expertise and capability, and 11) detailed gear specifications. Applicants must attend a pre---application meeting with agency, harbormaster or municipality staff to introduce and discuss the lease application. The applicant must also conduct a pre---application scoping session to familiarize the public with the proposal. Standard leases require a performance bond based upon areal coverage by structure: ≤ 400 square feet is \$1,500 and >400 square feet is \$5,000. The agency determines the performance bond amount for structures in excess of 2,000 square feet. A public hearing is required for all standard lease applications. Annual reports of seeding

and harvesting are required.

Information about aquaculture, laws, rules, the lease process, and all lease and license application forms are available at <http://www.maine.gov/dmr/aquaculture/index.htm>. All lease and license applications are joint forms shared with the U.S. Army Corps of Engineers, which coordinates the federal agency review process. No aquaculture gear can be placed in the water without an agency aquaculture lease or license and a permit from the U.S. Army Corps of Engineers.

The application for a standard lease to use suspended shellfish production gear is available here: <http://www.maine.gov/dmr/aquaculture/documents/suspendedapplication.pdf>. This document is a joint application and a copy is provided by the applicant to the U.S. Army Corps of Engineers to acquire their permit.

Marine aquaculture policies, procedures and regulations are posted here:
<http://www.maine.gov/dmr/aquaculture/index.htm>.

New Hampshire

The lead agency is the **Fish and Game Department** which has the authority to issue a Marine Aquaculture License for shellfish aquaculture. The license does not provide exclusive use and the applicant must propose a site where there is no unacceptable infringement upon existing uses. An applicant must pay a \$200 application fee and the following information describing the species to be cultivated, production methodology, location, tides, nearby natural resources (shellfish, seagrass and finfish), sediment, recreational and commercial activities, navigational characteristics (channels, aids to navigation, vessel traffic, moorings), production gear, seed sources, drug and chemical use, and animal health treatment methods. In addition, the applicant is to provide a written statement describing ownership or permission from owners to exercise any littoral rights necessary to carry out the project, copy of current municipal tax map, and list of names/addresses of all the abutters or littoral owners.

The Department has 30 days to notify the applicant that the application is complete and if so, the Department will conduct a site assessment. If acceptable, the Department will set a hearing date and the applicant will notify all abutters and littoral landowners and send copies of the application to the New Hampshire Department of Health and Human Services, Department of Environmental Services and Port Authority and the U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Coast Guard, and National Marine Fisheries Service. The Department shall post public notice of the hearing.

If successful, the license holder pays an annual fee of \$200 per acre per year for bottom culture or \$500 per acre per year for suspended culture. Licenses are annually renewable with a \$100 fee for as long as the operation is conducted under the criteria of the license. An option for growers is a five year license of \$1,000 for bottom culture or \$2,500 for suspended culture that does not include the annual renewal fee; however, the five year fee is

not refundable if the licensee decides to stop shellfish farming before his five year period has ended. Licenses cannot be sold but can be transferred or inherited. In addition, if the license holder is farming oysters, then the farmer must pay \$.015 per native oyster harvested.

The department's rule, Chapter 800, The Importation, Possession and Use of All Wildlife can be accessed here: http://www.gencourt.state.nh.us/rules/state_agencies/fis800.html. The pertinent language is Part 807, Aquaculture – Inland and Marine.

Massachusetts

Shellfish farming (on and off-bottom) is licensed by the local municipality. The **Division of Marine Fisheries** issues a propagation or aquaculture permit. Permits are awarded to individuals either to propagate shellfish, i.e. possess and cultivate sub-legal size shellfish while marketing only legal size shellfish (referred to as a Propagation Permit), or to aquaculture shellfish, i.e. possess, grow and market sub-legal (seed) and legal size shellfish (referred to as an Aquaculture Permit). The U.S. Army Corps of Engineers requirements are contained in a General Programmatic Permit for an area more than two acres in size and an Appendix C: Category 1 Form for areas less than two acres. Due to Massachusetts "home rule", where towns set their own regulations/requirements for aquaculture licensing, each municipality may vary somewhat from this generalized scenario, excluding the permits issued by Division of Marine Fisheries and the U.S. Army Corps of Engineers.

State statute (MGL Chapter 130 section 57) authorizes municipalities (city council, mayor or town selectmen) to issue a renewable and transferable license that allows the holder to: 1) to plant and grow shellfish, bottom/off bottom culture; 2) to place shellfish in or under protective devices affixed directly to the tidal flats or land under coastal waters, such as boxes, trays, pens, bags, or nets; 3) to harvest and take legal shellfish; 4) to plant cultch for the purpose of catching shellfish seed; and 5) to grow shellfish by means of racks, rafts or floats.

The license may be issued with a 10 year term with an annual fee of \$5 to \$25 per acre for up to 25 acres. Whoever 1) takes shellfish from the licensed lands or waters or from said racks, rafts or floats; 2) disturbs the licensed area or the growth of the shellfish thereon in any way; 3) discharges any substance which may directly or indirectly injure the shellfish; 4) willfully injures, defaces, destroys, removes or trespasses upon said racks, rafts, or floats; or 5) willfully injures, defaces, destroys, removes or trespasses upon said protective devices affixed directly to the tidal flats, such as boxes, trays, pens, bags, or nets shall be liable in tort for treble damages and costs to the licensee injured by such acts. The authorizing statutes are available here:

<https://malegislature.gov/Laws/GeneralLaws/PartI/TitleXIX/Chapter130/Section57--68>.

An in-depth regulatory description is provided in a publication entitled, *Best Management*

Practices for the Shellfish Culture Industry in Southeastern Massachusetts, and available here: <http://www.mass.gov/eea/docs/agr/aquaculture/shellfish---bmps---v09---04a.pdf>.

Rhode Island

The **Coastal Resources Management Council** offers a marine aquaculture lease that can be acquired via two different processes. A one-time, per site Commercial Viability Permit allows a farmer to conduct a limited study of a proposed site to determine its suitability. The application fee is \$25 for a three year permit and 1,000 square feet that allows a one-time sale of any product grown on the site. The initial 1.5 year period is approved administratively. The second 1.5 year period requires Council approval. Because of the opposition to sequestering state waters, this permit is rarely acquired (except by true novices) since most applicants realize they might as well fight the battle for a three acre lease.

If the applicant has proven commercial viability either through a permit, or the initial permit is not necessary, the first step to acquire a lease is to file for a Preliminary Determination. The fee is \$25. The Preliminary Determination consists of a meeting between the applicant, state agencies (Department of Environmental Management and Council), fishing industry associations, township (harbor committee, harbor master and planning department) and federal agencies (U.S. Army Corps of Engineers, National Marine Fisheries Service) to review and discuss that applicant's proposal. The Council's Aquaculture Coordinator prepares a report summarizing the meeting that may include recommendations.

Given a positive outcome to the Preliminary Determination, an application is made for a 10-year lease with an application fee based upon an estimated project cost. Minimum fee is \$50 with a sliding fee scale such that, for example, a project costing between \$10K and \$25K incurs an application fee of \$250. The applicant provides a site and operational plan, detailed production gear description, and temporarily marks the location with buoys for Council site inspection. The application is subject to internal and external review (essentially the parties and anyone else that participated in the Preliminary Determination). A 30-day public comment period occurs and, if contested, a public hearing. If all goes well, the Council grants a lease after which the candidate leaseholder provides a performance bond and pays the lease fee. The performance bond is determined by the Aquaculture Coordinator and because the majority of leases are three acres in size and located in shallow water the average bond is \$5,000.

The lease fee is \$150 for the first acre and \$100 for each additional acre. Leases are renewed annually and the leaseholder must file a report. This report entails planting number, seed source, inventory, number harvested, number sold, and number sold to retail and/or wholesale.

The **Department of Environmental Management** offers an annual Aquaculture License with a fee of \$200. Applications are submitted to the Coastal Resources Management

Council and must include an operational plan that describes the location and boundaries of the lease, types and locations of structures, species to be cultured, record maintenance and harvest methods. The operational plan is subject to review by the department and the Department of Health. A permanent record is maintained by the Council.

A Guide to Aquaculture Lease Application is available here:

<http://www.crmc.ri.gov/applicationforms/AquaApp.pdf>.

Connecticut

The **Department of Agriculture's** authority encompasses leasing submerged lands within state jurisdiction waters. Applicants nominate a lease site that does not interfere with any established right of fishing. Lease applications include a fee of \$100, which includes an advertising fee of \$90, and a recording fee of \$10. The department then publically advertises the lease for sealed bid. Agency policy requires a minimum bid of \$4 per acre and a lease is granted for a three year period. The lease may be renewed provided the lessee has paid the yearly rental fee. The bidders, including the applicant, submit a bid (i.e., first year rental fee) for the lease along with a lease application. If the applicant is unsuccessful, the application fee (minus the advertising cost) and first year rental fee are returned.

Applicants intending to culture shellfish off the bottom must submit a no-fee application for a Joint Programmatic General Permit for Aquaculture. Before completing the application, a pre-screening meeting with the State Aquaculture Coordinator, is recommended. If the proposed project area is within town waters, the proposed project plan must be reviewed by the township shellfish commission.

The application is forwarded to: Department of Environmental Protection---Office of Long Island Sound Programs, DEP---Marine Fisheries, DEP---Boating, U.S. Army Corps of Engineers, and to the local Shellfish Commission, if applicable. If the aquaculture gear has the potential to interfere with navigation, and/or will not be located within a lease, franchise or designated shellfish areas, the activity will likely require a Structures, Dredging & Fill and Tidal Wetlands Permit or Certificate of Permission from DEP---Office of Long Island Sound Programs. The Structures, Dredging & Fill and Tidal Wetlands permit is issued by DEP--- Office of Long Island Sound Programs for new work conducted seaward of the high tide line in tidal, coastal or navigable waters of the state, including dredging and the placement of structures or fill material. The Certificate of Permission is issued by DEP---Office of Long Island Sound Programs for certain minor activities involving dredging, erection of structures, or fill in any tidal, coastal or navigable waters of the state. If a boat is able to transit the area where structure(s) is proposed to be placed, the applicant will likely be required to obtain a Marker Permit Application from DEP---Boating.

The U.S. Army Corps of Engineers review may result in an Individual Permit or a letter of approval as provided for under a Programmatic General Permit. A copy of the U.S. Army Corps of Engineers approval letter, when issued, will be forwarded to the department and the

DEP---Office of Long Island Sound Programs. If the project is permitted within town waters, the local shellfish commission will also receive a copy.

Once the appropriate permit(s) or exemption letters from the Department of Environmental Protection and/or U.S. Army Corps of Engineers are granted, the department issues a Certificate for Aquaculture Operations to the applicant. Written authorization from all three agencies is required before aquaculture activities can commence or gear can be placed in the water.

Towns, cities or boroughs can lease coastal waters located inside the “town line” and create shellfish commissions to govern such activities. As a general statement, these municipalities charge a flat fee for leases and lease fees vary between towns.

Marine aquaculture policies, procedures and regulations for state waters are posted here: <http://www.ct.gov/doag/cwp/view.asp?a=3768&q=451508&doagNav=>

A Guide to Marine Aquaculture Permitting in Connecticut is available here: <http://seagrant.uconn.edu/publications/aquaculture/permitguide.pdf>. This document includes state and town regulations.

New York

The lead agency is the **Department of Environmental Conservation**, Division of Fish, Wildlife and Marine Resources, Bureau of Marine Resources. The department issues an on/off---bottom shellfish culture permit to authorize commercial shellfish culture activities. In addition to the department’s own review of on/off---bottom shellfish culture permit applications, any culture operation where the applicant proposes off---bottom culture (i.e., deployment of any demersal, suspended or floating gear) is also reviewed by the Department of State’s Coastal Management Program and the U.S. Army Corps of Engineers for consistency with coastal regulations and the Nationwide Permit 48, respectively. In most cases, applicants must also secure a Private Aids to Navigation permit from the U.S. Coast Guard for properly marking an operation to alert mariners. If the application is approved by all involved state and federal agencies, this annual and renewable permit is issued by the department with an annual fee of \$100. The permit holder must also obtain a \$50 annual Commercial Shellfish Harvester license.

An integral part of the shellfish culture permit application process involves the applicant demonstrating to the department that they have secured the rights to site a culture operation at a given location, whether through direct ownership of the underwater land, or through a lease agreement, letter of permission, etc., from the underwater land owner. A few programs do exist where prospective culturists can gain access to underwater lands in New York for shellfish culture. The largest program is Suffolk County’s Aquaculture Lease Program for Peconic and Gardiners Bays, wherein the state has ceded control of 110,000 acres of underwater land in Peconic and Gardiners Bays to Suffolk County for management of shellfish culture leasing only. Suffolk County’s program makes no distinction on what

types of shellfish culture activities can occur on a lease, whether on- or off-bottom culture. Another much smaller program is administered by the Town of Islip, which, along with the Towns of Babylon and Brookhaven, effectively controls the majority of underwater lands in Great South Bay. Islip's aquaculture lease program involves approximately 100 acres and specifies off-bottom culture methods only. Once a lease applicant is approved for a site in either of these programs, they can initiate the on/off-bottom culture permit application process with the department and the other involved agencies.

An in-depth description of the Suffolk County Aquaculture Lease Program is found here: [http://www.suffolkcountyny.gov/Departments/Planning/Divisions/EnvironmentalPlanning/Aquaculture LeaseProgram/LeaseProgramOverview.aspx](http://www.suffolkcountyny.gov/Departments/Planning/Divisions/EnvironmentalPlanning/Aquaculture%20LeaseProgram/LeaseProgramOverview.aspx). The Town of Islip's Aquaculture Lease Program is described here: <http://www.townofislip-ny.gov/news-archives/34-uncategorised/1997-lottery-recipients-set-to-farm-bay-bottoms-of-great-south-bay-program-reinforces-environmental-stewardship-tradition-and-new-profit-opportunities>. The Towns of Babylon and Brookhaven also appear to be working with a few shellfish culturists interested in leasing small parcels of the towns' underwater lands in Great South Bay, though to date, neither municipality has indicated plans for establishing a formal leasing program comparable to Islip's program.

The department also administers its own small program to aid prospective culturists in gaining access to state-controlled underwater lands, typically in Long Island Sound. A shellfish culture permit applicant can apply concurrently for a Temporary Marine Area Use Assignment for off-bottom shellfish culture only (i.e., contained, gear-based culture only; no broadcast seeding). An Assignment is defined as a five acre circular-shaped area that must be located at least 1,250 feet from the shoreline and one mile distant from any other Assignment holders. The applicant identifies the site by providing a center point and the department works with the applicant to determine if the site is suitable for shellfish culture and not in conflict with other users. A public notice describing the proposed operation and where it would be sited is published for one day in the legal notices of the local newspaper and in the department's Environmental Notice Bulletin. The notice establishes a public comment period of 30 days. If there are no regulatory issues or adverse public comment, the Assignment will be approved concurrently with the off-bottom culture permit. There is no additional fee for the Assignment and it is renewable annually along with the off-bottom culture permit.

New Jersey

The **Department of Agriculture** issues a no-fee Aquatic Farmers License and recommends implementation of Agricultural Management Practices. By statute (Title 4), the Department of Agriculture is the lead state agency for aquaculture advocacy and marketing. See <http://www.jerseyseafood.nj.gov/aquaculture.html>.

Pursuant to the shellfish statutes at N.J.S.A. 50 et seq., the Commissioner of the **Department of Environmental Protection** (through the Division of Fish and Wildlife's Bureau of Shellfisheries), has full control and direction of the shellfish industry and

resource throughout the entire State, which includes shellfish aquaculture. The agency assesses the suitability of submerged land, surveys potential leases, collects fees and vacates leases for nonrenewal. As funding permits, the agency conducts a benthic resource survey for state waters and this data is used, in part, to assist in identifying new potential lease areas. The Atlantic Coast and Delaware Bay Councils cover two sections of the State and have exclusive authority to lease bottom to individuals for the cultivation of shellfish, upon approval from the Commissioner. The agency provides biological advice on the prospective leases to the Council at a public meeting. The Council then decides whether a lease will be granted, upon approval of the Commissioner. An applicant proposes a lease site to the agency, pays a \$15 biological resource assessment fee and a biologist will review the proposed lease area data and assigns a density value (high, moderate and low) for wild shellfish, year classes and for submerged aquatic vegetation of regulatory significance. Leases are not approved where shellfish with “moderate” or “high” shellfish densities or where submerged aquatic vegetation are observed. The review process also weighs other issues such as user group conflicts, recreational use and navigation, etc. If the application is acceptable, it is discussed at two consecutive meetings of the Council. A decision on the application is made at the second meeting. The applicant is required to appear at one of the two meetings. If they do not appear, the application is denied.

The Council history of lease application approval is very high (greater than 95%). However, this is mainly due to the Bureau and Council preemptively screening areas that can't be leased, such as naturally productive shellfish habitat or other environmentally sensitive areas (i.e., submerge aquatic vegetation). If the Council approves a lease application, the applicant will receive a letter that he/she has 30 days to pay their lease fees (\$2 per acre/year (\$5 minimum)) and hydrographic survey fees (\$30 per corner for hydrographic survey). The applicant must also sign their lease agreement in person. Once the fees are paid and the lease agreement is signed, the applicant may begin to utilize their lease and the agency then conducts a hydrographic field survey to temporarily mark the lease corners. The leaseholder must install and maintain permanent marks within a time period established within the regulations. Leases are renewed annually. If a user does not renew the lease by December 31st the lease is vacated and made available to the public.

Hard clam aquaculture in New Jersey began in earnest in the early 1970s. The Atlantic Coast Section of the Council makes decisions primarily for hard clam leases that are a maximum of two acres in size and has granted ~2,500 acres with a lease fee of \$2 per acre. Oyster culture leasing in Delaware Bay started in the 1800s. The Delaware Bay Section of the Council, the agency, and potential oyster farmers are very familiar with suitable lease locations. There are ~33,000 acres under lease in Delaware Bay. The Councils will grant a lease up to a maximum of 200 acres with a fee of \$0.50 per acre. Oyster production on these leases is typically by cultch planting and oyster seed transplant from public beds.

U.S. Army Corps of Engineers permitting changes in 2007 required individual permit coverage for all existing shellfish culture leases and all traditional culture activities (such

as predator screening and shell planting). The Department of Environmental Protection applied for and obtained blanket Nationwide Permit 48 coverage on behalf of shellfish industry. New leases (obtained after March 17, 2007) are required to obtain a U.S. Army Corps of Engineers Nationwide Permit 48 directly and are not covered under the blanket. This federal permit also triggered state permits. The department, once again on behalf of shellfish industry, obtained state coverage for existing leases and future leases in all shellfish culture lease sections along New Jersey's Atlantic Coast and in Delaware Bay.

Recently, the department identified three Aquaculture Development Zones that allows the use of structure (e.g., cages, racks, bags, floats, etc.) for grow-out culture operations. Their coastal zone management regulations were also streamlined to allow this practice on traditional leases. An experimental ~40 acre intertidal Aquaculture Development Zone (each lease is 1.5 acres) is dedicated to rack-and-bag culture on an intertidal flat along the bayside shore of Cape May. A lease within this Zone is for an approximate five year period and the applicant must acquire a lease through a lottery and waiting list. This area had an initial fee of \$1,000 and annual renewal of \$100/acre. Two additional 'deep-water' Aquaculture Development Zones, totaling 1,100 acres, are dedicated to culturing oysters in subtidal bottom cages. No one has applied for a lease within these Zones and the agency representative thought the lack of interest may be related to the \$1,000 permit fee. Limited information about shellfish leasing is available at:

<http://www.nj.gov/dep/fgw/shelhome.htm>

Delaware

During August 2013, the Governor signed into law a bill authorizing the **Department of Natural Resources and Environmental Control** "to direct and control the shellfish aquaculture activities within the Inland Bays and to set criteria for the approval of lease sites and applications for leasing." Prior to this bill, sub-aqueous (bottom) leases were discontinued in 1979 and provisions in the Delaware Statutory Code prohibited shellfish aquaculture. The new law established: 1) leases to between one and five acres, 2) an application fee of \$300, 3) an annual lease fee of \$100 per acre (\$1,000 per acre for non-residents), 4) an annual renewal for a maximum of 15 years (leaseholder is reserved the first right of refusal to lease the area for another 15 years), and 5) limits the amount of bottom that may be leased within two of the several identified water bodies. The agency is currently identifying potential lease areas and creating regulations that govern eligibility, inspection, species, mechanical harvesting gear, marking, and other issues. These rules are to be announced on July 1, 2014. The authorizing legislation can be accessed here:

http://openstates.org/de/bills/147/HB160/?show_all_sponsors=True.

The **Delaware Sea Grant Program** published *Shellfish Aquaculture in Delaware's Inland Bays Status, Opportunities, and Constraints* just prior to the Governor signing the authorizing bill that provides an in-depth and excellent analysis. See <http://darc.cms.udel.edu/ibsa/Inland%20Bays%20Shellfish%20Aquaculture%20White%20Paper%202013.pdf>.

Maryland

Since 2009, Maryland reorganized its leasing program to create a new Aquaculture Division in the **Department of Natural Resources** with the intent of attracting new aquaculture producers and rebuilding its farm--raised shellfish industry. The revised program has an active use requirement that allows growers to apply for as much acreage as they need but with the stipulations that they file a production plan and meet established planting requirements, maintain corner markers and report their activities annually. Nonresidents and business entities are also allowed to apply for leases.

Commercial shellfish aquaculture leases in Maryland's Chesapeake Bay or Coastal Bays are granted for a term of 20 years and are renewable for an additional term. After a 40--year leasehold, continuous use of the same ground requires reapplication by the leaseholder. A non--refundable application fee of \$300 is required for each site. Annual lease rent is \$3.50 per acre for a Submerged Land Lease and \$25 per acre for a Water Column Lease.

The department and the U.S. Army Corps of Engineers, Baltimore District, streamlined Department of the Army authorizations for shellfish aquaculture projects no larger than 50 acres for a Submerged Land Lease, 5 acres for a Water Column Lease utilizing cages on bottom and 3 acres for a Water Column Lease utilizing floats. Applications exceeding the thresholds established in the RGP--1 are reviewed through an Individual Permit process which includes more comprehensive review by federal agencies, including issuance of a Federal public notice, and may require additional processing time. A \$100 fee is required by the U.S. Army Corps of Engineers when an Individual Permit is issued.

The department's Aquaculture Division has created an on--line *Maryland Aquaculture Siting Tool* to aid lease applicants in identifying suitable lease sites and create the proper maps to accompany an application. The tool is an interactive online map viewer that displays potential conflicts with existing commercial and recreational uses and environmentally sensitive areas. Applications are tracked by regular meetings of an interagency Aquaculture Review Board, which completes a preliminary review to identify potential problems and recommend modifications that may minimize post--application review and processing time.

Water Column Lease holders must maintain insurance throughout the term of the lease against loss or liability in connection with bodily injury, death, property damage or destruction, occurring within the leased area or arising out of the use of the lease by the leaseholder or its agents, employees, officers, and visitors. Required coverage is a minimum of \$1,000,000 per occurrence, \$2,000,000 annual aggregate, and shall contain broad form Commercial General Liability endorsement or its equivalent. Each such policy must name the lessee, the State of Maryland and the Department of Natural Resources as insured parties. A bond is not required; however, culture equipment must be marked with the name of the leaseholder and he or she is expected to retrieve lost or derelict gear.

Joint lease and federal permit application, siting tool, and other information are available here: <http://www.dnr.state.md.us/fisheries/oysters/industry/aquaculture/>.

Virginia

The **Marine Resources Commission's** Habitat Management Division manages the leasing of state waters for shellfish culture and the Fisheries Management Division regulates activities associated with culturing shellfish. Please see http://www.mrc.virginia.gov/Shellfish_Aquaculture.shtm.

Virginians interested in leasing submerged lands for shellfish culture pay a \$25 application fee and can nominate ≤ 250 acres. The agency advertises the application over a four week period and the applicant pays the advertising fee. If no opposing comments are received, the agency surveys the site, installs applicant provided corner markers and produces a plat for a fee of \$675. Following corner marker installation, there is a 30-day wait period for the public to physically inspect and comment on the potential lease. If no opposition is received the agency records and assigns the lease for fees of \$1.50 and \$12, respectively. The annual lease rental is \$1.50 per acre. A lease has a 10 year term. Lessees must prove that shellfish production activity is occurring on the lease or it will be canceled.

If the application is protested and the protest cannot be adequately addressed by agency staff, the application is scheduled for a public hearing before the Marine Resources Commission (citizens appointed by the governor) for final resolution. Commission decisions can be appealed at the circuit court level.

Farmers wanting to grow shellfish in cages that extend no more than 12-inches off the bottom on a regular oyster ground lease and cause minimal interference with navigation must comply with Habitat Management regulations that prohibit placing cages on submerged aquatic vegetation and the use of any cage material that might leach toxic substances. The requirements are posted here: <http://www.mrc.virginia.gov/regulations/onbottom.shtm>.

Farmers wanting to grow shellfish in cages or containers that are greater 12-inches above the bottom and/or to be marked on the surface with buoys must acquire a General Permit from the Fisheries Management Division. A container shall not: leach toxic materials, be stacked or placed to create a navigational hazard, exceed 70 cubic feet in volume, exceed 250 containers per acre, and exceed 250 arrays of containers within the permitted area. Permit fees are associated with the number of containers: ≤ 500 is \$125, $>500 \leq 1000$ is \$250, $>1000 \leq 2500$ is \$625 and >2500 is \$1,000. Permit regulations and requirements can be found here <http://www.mrc.virginia.gov/regulations/fr1130.shtm>.

Farmers wanting to grow shellfish in floating cages on the surface above state-owned subaqueous bottomlands, whether they possess an oyster ground lease or not, must submit a Joint Permit Application, with a detailed plan of the operation, to the Habitat Management Division. The joint application is with the U.S. Army Corps of Engineers and other state agencies. If a permit is granted, the lessee pays a royalty "for encroaching on the bottom" of \$.005 per square foot per year (\$217.80 per acre per year) which has a five year term.

Riparian landowners that own at least 205 feet of coastal land can also lease <.5 acre. Their application is not advertised and there is no annual lease fee.

Farmers harvesting aquaculture products must possess an Aquaculture Product Owners License and any commercial oyster aquaculture operation taking oysters from riparian, fee--- simple, or privately leased ground must pay a user fee of \$50 a year.

North Carolina

The **Department of Environment and Natural Resources**, Division of Marine Fisheries, Habitat and Enhancement Section, manages shellfish leasing and regulates shellfish culture activities associated with leasing under the authority granted by General Statutes and rules adopted by an appointed Marine Fisheries Commission. The agency offers an application for both bottom culture and water column. The bottom lease currently allows for the grow out of oysters (eastern) and clams (hard, blood, venus ray, etc.) , using cultch (shell or rock) as well as seed spread on the bottom or with the use of clam bags planted/bedded in the bottom. The water column lease allows for the use of gear within the water column (cages, racks, stacked bags, floating gear, strings, lantern nets, etc.).

Bottom culture application involves the applicant: 1) identifying a location ($\geq .5$ acre ≤ 5 acres that are harvested by manually labor or $\geq .5$ acre ≤ 10 acres in locations where mechanical harvest is allowed), 2) a \$200 fee that is imposed if the application is accepted and returned if the lease application is denied, and 3) a simple production description. The agency assesses the site and reviews the production methods to determine acceptability. Upon acceptance the applicant pays the application fee, a prorated lease rental fee of \$10.00 per acre and provides a lease site survey prepared by a licensed surveyor. Leases are renewed at five year intervals and renewal includes a fee of \$100. No more than 50 aggregated acres are allowed per person, corporate entity, corporate shareholder, or single family unit. Lease holders must produce and market 10 bushels per acre of shellfish each year, plant 25 bushels per acre of shellfish seed or 50 bushels per acre of cultch per year or a combination of seed and cultch. New leaseholders, lease transfers, or non---productive leaseholders must pass a written examine ($\geq 70\%$ correct) to finalize or retain their lease. This examination covers: 1) shellfish lease application process, 2) shellfish lease planting and production requirements, 3) lease marking requirements, 4) lease fees, 5) shellfish harvest area closures due to pollution, 6) safe handling practices, 7) lease contracts and renewals, 8) lease termination criteria, and 9) shellfish cultivation techniques.

Water column applicants must already possess a shellfish bottom lease, or have submitted a bottom lease application in conjunction with the water column application. Water column application procedure and examination are the same as bottom leases but require a \$100 application fee, \$100 per acre rental fee, and \$100 renewal fee every five years. In addition to the production description, applicants must provide a plan view and cross section drawing of the structures proposed that includes mean low and mean high water lines. Production targets are to harvest 40 bushels of shellfish per acre per year or to plant 100 bushels of seed or cultch per acre per year. Production within a water column area of

a bottom lease negates bottom lease production requirements for that lease.

Proposed shellfish lease locations can not contain more than 10 bushel of shellfish per acre or contain any submerged aquatic vegetation or have historically contained submerged aquatic vegetation within the last ten years. Proposed shellfish lease locations are investigated, sampled and reviewed prior to issuance.

Franchises are deeded bottom locations that were issued in the past by a prior Shellfish Commission or other public entity, and that were previously recognized as submerged land claims. The franchise bottom is deeded in perpetuity; however, the agency can cancel these franchises if there are not being productively managed.

Agency staff provide bottom and water column lease application packages. There is no webpage dedicated to shellfish leasing, but there is a link to find the Marine Fisheries Commission rules for leasing (15A NCAC 03O.0201 --- .211 and G.S. 113---201.1---202.2): <http://portal.ncdenr.org/web/mf/rules---and---regulations>. Agency staff plans to have a dedicated website for Shellfish Leases by December 2014.

Applications can be found at:

http://portal.ncdenr.org/c/document_library/get_file?uuid=be849a63---3480---48c0---96a6---0919865d1cba&groupId=38337.

South Carolina

The **Department of Natural Resources**, Department of Health and Environmental Control (**Ocean and Coastal Resource Management**) and **U.S. Army Corps of Engineers** offer a joint shellfish mariculture permit application package. Applicants are encouraged to contact the Department of Natural Resources, Office of Shellfish Management for guidance and assistance. Applications that include an operational plan are submitted to the Department of Natural Resources with a \$25 fee. If the Ocean and Coastal Resource Management or U.S. Army Corps of Engineers determines the proposal does not qualify for a General Permit or Nationwide Permit 48, respectively, then an Individual Permit will be required. The Ocean and Coastal Resource Management General Permit is only applicable for a farm ≤ 25 acre. A farm with a larger footprint must apply for an Individual Permit. There is a \$1,000 fee associated with the Ocean and Coastal Resource Management Individual Permit and a \$100 fee associated with the U.S. Army Corps of Engineers Individual Permit. Production issues that may delay permitting include culture of shellfish other than oysters and clams and use of production gear other than soft bags, on- or off- bottom cages. A prospective permittee can only propose to conduct operations in Approved Shellfish Waters. Use conflicts are resolved on a case-by-case basis. If the proposal appears to qualify, then the applicant must place a classified ad for three weeks to inform the public of the proposed activity and location and allow public comment to the Department. Once the advertising requirement is satisfied, the applicant notifies the Department and, if Ocean and Coastal Resource Management and U.S. Army Corps of Engineers have issued permits and there are no adverse public comments, the Department

will issue a Shellfish Mariculture Permit. The permit has a renewable five year life and an annual rent of \$5 per acre. The permittee must report planting and harvest activities, acquire a special permit if acquiring seed from out-of-state and acquire Wholesale Seafood Dealer's License and Shellfish Dealers License from the department.

This is a link to the Joint Mariculture Application for South Carolina:

http://www.sac.usace.army.mil/Portals/43/docs/regulatory/Mariculture_Joint_App_7.25.13.pdf.

Georgia

The **Department of Natural Resources**, Coastal Resources Division, is the lead agency for leasing sovereign submerged lands. A complicating factor is that approximately 60% of Georgia submerged lands are Crown Grants and determining ownership requires an expensive title search. The agency recognizes two types of leases: Private and State. Private leases are usually based upon a Crown Grant and State leases are within areas of state jurisdiction and probably have a history of prior use to produce shellfish. An additional complication is the tidal amplitude, six to seven feet, which results in large lease areas, 170 to 4,500 acres, because much of the area may be usable and broken up by salt marshes, tidal creeks, and mudflats. Leaseholders are referred to as "stewards" and control of salt marsh and existing shellfish resources (clam flats and oyster bars) within the lease boundaries. Applicants for leases bid in a public forum and fees are based upon the public bids for the entire lease. A minimum bid of \$500 is required. Applicants are also required to submit a five-year management plan to the department and a five-year business plan to the **Department of Agriculture**. A committee is established to review the bids and the management plan can be a deciding factor in selecting the steward. Leases have no maximum term and are renewable. Stewards are limited to using one meter from the bottom to prevent navigational or other negative interactions with the public. Gear configuration and construction is not regulated, the agency will regulate on a case-by-case basis. There is little to no information posted on Georgia websites:

<http://coastalgadnr.org/fb/shell/csh>.

Florida

The **Department of Agriculture and Consumer Services**, Division of Aquaculture, is the lead agency. An application for an aquaculture lease (bottom and/or water column) consists of the lease location, description of the proposed activity and species, and a business plan. The application package is reviewed by the department, Fish and Wildlife Conservation Commission and Department of Environmental Protection. As part of the review process, a site inspection will be made by department staff to determine whether or not the site is appropriate for the proposed use. In cases where the proposed location is not suitable, additional field surveys and site inspections may be necessary to modify the initial site boundaries. When the application is deemed to be complete, and acceptable to the other state agencies, the applicant pays a \$200 application fee and notice of the lease application is provided to local entities.

The department has acquired, on behalf of all Florida shellfish farmers, a Programmatic General Permit from the U.S. Army Corps of Engineers for bivalve mollusc and live rock culture except for an applicant that proposes to lease state submerged lands within the boundaries of listed species critical habitat (Gulf of Mexico sturgeon, smalltooth sawfish or Johnson seagrass). An applicant interested leasing within listed species critical habitat must acquire an Individual Permit from the U.S. Army Corps of Engineers.

Leaseholders that intend to culture oysters off-bottom, adjustable long line or floating cages, will have to acquire a permit from the U.S. Coast Guard to install approved Private Aids to Navigation. The permitting process results in National Ocean Service modification to coastal navigational charts that identify their location as being a hazard to navigation and navigational marking visible to the boating public that is installed and maintained by the leaseholder.

Any state-owned submerged lands lease must be authorized by the Governor and Cabinet in their role as the Board of Trustees of the Internal Improvement Trust Fund. The applicant appears before the Governor and Cabinet to receive approval. Leases are renewable for 10 year terms with a \$16.73 annual per acre fee for bottom culture, \$33.46 annual fee for water column culture and a \$10 surcharge per acre for both. Leaseholders must abide by the provisions of the lease agreement, acquire an annual Aquaculture Certificate of Registration that includes a \$100 annual fee, implement environmentally-oriented Best Management Practices, are subject to unannounced department site inspections, and must respond to an annual production audit from the department.

A description of the lease application process and application form can be found here: <http://www.freshfromflorida.com/Divisions---Offices/Aquaculture/Agriculture---Industry/Aquafarm---Program/Aquaculture---Leasing>. Information about and application to obtain the Aquaculture Certificate of Registration and Best Management Practices can be found here: <http://www.freshfromflorida.com/Divisions---Offices/Aquaculture/Agriculture---Industry/Aquafarm---Program/Aquaculture---Certification>.

Go to the link below for state-by-state shellfish aquaculture permitting information http://www.nmfs.noaa.gov/aquaculture/shellfish_portal/state_permitting_shellfish_aq.pdf

Appendix B. Federal Statutes and Regulations Affecting the Expansion of Aquaculture Sites

Animal Health Protection Act, 7 U.S.C. § 8301- 8321

Mostly deals with importing, exporting, and interstate movement of potentially diseased or contaminated shellfish. The act doesn't restrict growth sites, but does restrict the sale or movement of shellfish that is considered diseased or contaminated.

Coastal Zone Management Act, 1990 and 1996 Amendments (CZMA), 16 U.S.C. § 1451-1466, This Act is concerned with protecting the ecological, cultural, historic, and esthetic value of the coastline. It provides for the management of the nation's coastal resources, including planning for the siting of pollution control and aquaculture operations and developed a coordinated process among state agencies to regulate aquaculture. The CZMA is administered by NOAA's Office of Ocean and Coastal Resource Management and implemented through state coastal zone management programs. The Act requires an applicant for a federal license or permit, for an activity affecting the coastal zone, to provide a certification to the authorizing agency that the proposed activity complies with the enforceable policies of approved state coastal zone management programs and that the activity will be conducted in a manner consistent with the program. 15 CFR 923.122 (9) Authorizes the adoption of procedures and policies to evaluate and facilitate the siting of public and private aquaculture facilities in the coastal zone, which will enable states to formulate, administer, and implement strategic plans for marine aquaculture. Additionally, the Act also requires an applicant for a federal license or permit for activities affecting the coastal zone, to provide a certification to the authorizing agency that the proposed activity complies with the enforceable policies of approved state coastal zone management programs and that the activity will be conducted in a manner consistent with the program.

Endangered Species Act (ESA), 16 U.S.C. §§ 1531-1544

Restricts critical habitat sites where endangered or threatened animals and plants reside, reproduce, and feed. The Act requires NOAA to protect and recover all endangered and threatened species under the Department of Commerce. NOAA is also authorized to address potential environmental impacts from marine aquaculture operations. The act does allow permits for exceptions § 10(a)(1)(A). Such as scientific research or enhancement permits 50 C.F.R 222.308. The act also allows an incidental taking permit under § 10(a)(1)(B); 50 C.F.R. 222.307. 50 C.F.R. 17.84 allows certain exceptions for accidental takings. Under 50 C.F.R. 17.9, special permits can be obtained for activities where endangered species live. Section 7 of the ESA allows for consultations. The most frequent types of consultations in which NOAA engages are with the U.S. Army Corps of Engineers, since most finfish and shellfish aquaculture facilities in state or federal waters require a federal permit from this agency. Consultations focus on impacts of aquaculture on ESA listed species, critical habitat for ESA listed species, and essential fish habitat for Magnuson-Stevens Act managed species.

Federal Water Pollution Control Act (Clean Water Act), 33 U.S.C. §§ 1251- 1387

The purpose of the Act is to restore and maintain physical, biological, and chemical integrity of the nation's waters. The Act limits pollution from aquaculture facilities via the Concentrated Animal Feeding Operation Rule (CAFO). Concentrated aquatic animal production (CAAP) operations are considered point sources of pollution under the Clean Water Act and are subject to

National Pollutant Discharge Elimination System (NPDES) permits. They are the equivalent of Concentrated Animal Feeding Operations (CAFOs). Not all aquaculture facilities are CAAPs under the regulation. The rule applies to facilities that produce 100,000 pounds or more of aquatic animals per year. 40 CFR 451.1.

In U.S. Pub. Interest Research Group v. Heritage Salmon Inc., the court found concentrated aquatic animal production facilities require a national pollutant discharge elimination system permit 2002 U.S. Dist. LEXIS 2706, 32 ELR 20535 (D. Me. 2002). The court determined such operations point sources of pollution as defined in 40 C.F.R. 122.25 because uneaten food, escapees, bacteria, disease, parasites, animal waste, and chemicals are point sources of pollution. CAFO rules are not applicable for our purposes since the shellfish will not be fed.

Federal Food, Drug, and Cosmetic Act, 21 U.S.C. §§ 301-397

Primarily concerned with food safety regulations and drug approvals. The FDA regulates the sale of contaminated or diseased shellfish. The act established the National Shellfish Sanitation Program which establishes federal guidelines for depuration times, disease control, and other shellfish sanitation practices. While this Act doesn't directly affect the expansion of aquaculture sites, it will affect the sale of end product and could discourage potential farmers.

<http://www.fda.gov/Food/GuidanceRegulation/FederalStateFoodPrograms/ucm2006754.htm>

Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. §§ 1801-1891(d)

This Act promotes conservation of fishing areas by preventing loss of habitat and rebuilding stocks. The Act requires NOAA to review activities in marine waters that may impact species or habitats. Section 1851 establishes the National Fishery Management Program to minimize or eliminate the mortality of by-catch. Section 1865 establish a by-catch reduction program. The act also created a New England Council to identify and preserve essential fish habitat. Section 1856 also gives the state jurisdiction to preserve essential habitats. Generally concerned with wild caught fish, but aquaculture facilities are subject to the by-catch regulations as well.

Under 50 CFR §§ 600.905 - 600.930, consultations with the EPA are available to determine essential fish habitats. Consultations focus on impacts of aquaculture on essential fish habitats for MSA managed species.

Marine Mammal Protection Act (MMPA), 16 U.S.C. §§ 1361-1423(h)

This Act protects endangered or threatened marine mammals by preventing activities that disturb or could potentially disturb marine mammal life. MMPA requires NOAA, under the Department of Commerce jurisdiction, to protect all marine mammals. This Act also requires NOAA to address potential impacts from aquaculture facilities. Section 1373 (c)(5) prevents fishing in areas that will disturb marine mammals. The Act objective is to achieve a zero mortality rate of marine mammals. Regulations allow for incidental harassment authorization 50 CFR 216.101 – 108. 50 C.F.R. 229.2 Commercial fishing operation means the catching, taking, or harvesting of fish from the marine environment (or other areas where marine mammals occur) that results in the sale or barter of all or part of the fish harvested. The term includes aquaculture activities.

50 CFR § 229.3 prohibits:

(a) It is prohibited to take any marine mammal incidental to commercial fishing operations.

- (e) It is prohibited to retain any marine mammal incidentally taken in commercial fishing operations unless authorized by NMFS personnel, by designated contractors or an official observer, or by a scientific research permit that is in the possession of the vessel operator.
- (f) It is prohibited to intentionally lethally take any marine mammal in the course of commercial fishing operations unless imminently necessary in self-defense or to save the life of a person in immediate danger, and such taking is reported in accordance with the requirements of § 229.6.

Marine Protection, Research, and Sanctuaries Act of 1972, 16 U.S.C. §§ 1431-1445

This Act protects areas of the marine environment which have special conservation, recreational, ecological, historical, cultural, archeological, scientific, educational, or esthetic qualities as national marine sanctuaries managed as the National Marine Sanctuary System will: (A) improve the conservation, understanding, management, and wise and sustainable use of marine resources;(B) enhance public awareness, understanding, and appreciation of the marine environment; and (C) maintain for future generations the habitat, and ecological services, of the natural assemblage of living resources that inhabit these areas. This Act could restrict potential aquaculture sites if the area is protected.

National Aquaculture Act of 1980, 16 U.S.C. §§ 2801-2810

This Act promotes aquaculture in the United States by (1) declaring a national aquaculture policy; (2) establishing and implementing a national aquaculture development plan; (3) establishing the Department of Agriculture as the lead Federal agency with respect to the coordination and dissemination of national aquaculture information by designating the Secretary of Agriculture as the permanent chairman of the coordinating group and by establishing a National Aquaculture Information Center within the Department of Agriculture; and (4) encourage aquaculture activities and programs in both the public and private sectors of the economy; that will result in increased aquaculture production, the coordination of domestic aquaculture efforts, the conservation and enhancement of aquatic resources, the creation of new industries and job opportunities, and other national benefits.

16 U.S.C. § 2801(7) Despite its potential, the development of aquaculture in the United States has been inhibited by many scientific, economic, legal, and production factors, such as inadequate credit, diffused legal jurisdiction, the lack of management information, the lack of supportive Government policies, and the lack of reliable supplies of seed stock.

16 U.S.C. § 12801 (8) Many areas of the United States are suitable for aquaculture, but are subject to land-use or water-use management policies that do not adequately consider the potential for aquaculture and may inhibit the development of aquaculture.

7 U.S.C. § 3321 Established the joint subcommittee on aquaculture to promote research of certain institutions and to coordinate their efforts as an integral part in the implementation of the National Aquaculture Act by encouraging landowners, individuals, and commercial institutions to develop aquaculture production and facilities and sound aquacultural practices that will, through research and technology transfer programs, provide for the increased production and marketing of aquacultural food products.

In 2011, NOAA established the National Shellfish Initiative to increase populations of bivalve shellfish through commercial production and conservation activities. NOAA Aquaculture Policy (2011): No real restrictions, the Act intends to promote aquaculture expansion.

National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. §§ 4321-4370f

This Act requires NOAA to consider the potential effects of marine aquaculture facilities on the environment. Could be restrictive if aquaculture negatively affects the environment.

National Aquaculture Improvement Act 1985, amended one section of the national aquaculture act. (3) Section 2 (a)(7) of the National Aquaculture Act of 1980, 16 U.S.C. 2801, was amended by this act by inserting "scientific" before "economic", and by inserting "the lack of supportive government policies" immediately after management information.

National Sea Grant College Program Act 1968, provides NOAA with authority to conduct research, extension, education, and communications to achieve a sustainable environment and to encourage the responsible use of America's coastal, ocean, and Great Lakes resources, including support for aquaculture.

Saltonstall-Kennedy Act 1954, provides authority for NOAA to award contracts, grants, or cooperative agreements for fisheries research and development projects addressing any aspect of US fisheries, including but not limited to harvesting, processing, aquaculture, marketing, and associated infrastructures.

U.S. Army Corps of Engineers

The Army Corps of Engineers has statutory authority to regulate aquaculture permits via the Rivers and Harbors Act of 1899, Section 404 of the Clean Water Act, and Section 103 of the Marine Protection, Research, and Sanctuaries Act of 1972. A Section 10 permit is required for any structure or work in or affecting navigable waters of the United States. Rivers and Harbors Act of 1899, 33 U.S.C. 403. The Army Corp requirements restrict aquaculture expansion more than any other federal requirement.

Appendix C: Massachusetts Aquaculture Regulations

The federal Coastal Zone Management Act 16 U.S.C. 1451 enables states to develop programs to license and regulate aquaculture if the policies are consistent with federal law. The Executive Office of Energy and Environmental Affairs under Mass. Gen. Laws ch. 21A, §§ 2 and 4A. Section 4A establishes a coastal zone management office (CZMO). The secretary will direct the CZMO to adopt rules, regulations, procedures, standards, guidelines, and policies that will constitute the Massachusetts coastal zone management program. The program will fulfill the objectives of the federal CZMA.

The Massachusetts Coastal Zone Management Program (CZMP) 301 C.M.R. 20 is administered by the Secretary of the CZMO and follows the federal CZMA and related regulations 15 CFR §§ 923 and 930. The CZMP governs coastal resources and uses. The CZMO enforces the Coastal Program Policies and will review projects to ensure they are consistent with federal policy. Mass. Gen. Laws ch. 21A § 4A.

The state of Massachusetts Home Rule Procedures Act gives individual municipalities the authority to enact ordinances, by-laws, and charters unless they contradict the state constitution of general laws. Amendment Article 89, Mass. Gen. Laws Ch. 43B. The Home Rule Act allows individual municipalities to license aquaculture sites in their region. Mass. Gen. Laws ch. 130 § 57.

Under Mass. Gen. Laws ch.130 § 17B, the Director of Marine Fisheries (DMF) may, by issuance of a written permit under certain terms and conditions, authorize the possession and taking of fish at any season and of any size for purposes of propagation, rearing, harvesting or sale in connection with aquaculture operations.

Mass. Gen. Laws Ch. 130 § 57 authorizes towns to issue aquaculture licenses. The license issued by the town allows aquaculture farmers, in a specified site, and at all times of the year, to: grow and plant shellfish on or off bottom; to protect the shellfish in devices; to harvest and take legal shellfish, to plant clutch for the purpose of catching seed; and to grow shellfish using floating devices. Prior to a municipality issuing an individual a license for an aquaculture site, the applicant must show plans to demonstrate the intended project and the location of the project site. Additionally, public notice and a public hearing, as required by § 60 of ch.130, is necessary before a license is issued. Section 57 also requires certification that the aquaculture operation will not have any adverse effect on the shellfish or natural resources of the town. Also, a license cannot be issued for an area currently, or within the previous two years, closed for municipal harvesting under § 54. Section 54 allows towns to close areas to plant, grow, restock or protect shellfish. Mass. Gen. Laws ch.130 § 54. After the closed season has ended, the area cannot be licensed for private use for two years.

Under 322 C.M.R. 7.01(4), a permit to operate an aquaculture facility is required by the DMF. An open water system with minimal structures and no feeding requires a Class 3 permit. 322 C.M.R. 15.04. A type 1 permit would then be required to possess and grow shellfish seed. The permit can be endorsed to allow for the use of upwellers to grow seed, but does not allow for the resale of seed. An application for a Type 1, Class 3 permit needs to provide DMF with the following information: a detailed site plan, geophysical site characteristics, benthic habitat

conditions, proposed species and quantities, physical structures, a Municipal Shellfish Aquaculture License or conditional approval, a municipal Wetlands Permit (or non-applicability determination), application for Corps of Engineers section 404 Permit, and a transcript of the local public hearing. Section 15.08 (6) allows the DMF to restrict the operation of a permit if conditions or practices are found to be unacceptable or amend restrictions as found necessary.

Applications for open water aquaculture permits are subject to a review by the Division of Marine Fisheries, and other agencies, to identify any potential adverse effects the aquaculture operation may have on the site. Areas that could be subject to inspection are: water quality, exposure of structures, shellfish habitat and growing area classification, benthic habitat conditions, submerged aquatic vegetation, endangered species, marine mammals, other uses of the area, wild species, navigation, and access to the site. 322 C.M.R. 15.06(1). New applications for aquaculture permits are obtained from the Aquaculture Program coordinator in the Department of Agricultural resources. An aquaculture operation description form and a Massachusetts permit guidance document must be provided. The Aquaculture Program Coordinator will determine if a pre-application meeting is necessary with state and federal agencies. 15.06(2) (a)(b). An exception to 15.06(2)(a)(b) exists if the applicant is pursuing town issued aquaculture permits. If this is the case the applicant should follow the town's application process.

Regulatory Authority: 322 C.M.R. 15.00: M.G.L. ch 21A, § 2 ch. 30A, § 3 and c. 130, § 2, 17B, 23, 24, 25, 27, 28, 57, 69, 80, 82, and 104.

The Wetlands Protection Act, Mass. Gen. Laws ch. 131 section 40. No person shall remove, fill, dredge or alter any bank, riverfront area, fresh water wetland, coastal wetland, beach, dune, flat, marsh, meadow or swamp bordering on the ocean or on any estuary, creek, river, stream, pond, or lake, or any land under said waters or any land subject to tidal action, coastal storm flowage, or flooding . . . without filing written notice of his intention to so remove, fill, dredge or alter, including such plans as may be necessary to describe such proposed activity and its effect on the environment and without receiving and complying with an order of conditions and provided all appeal periods have elapsed. Said notice shall be filed by delivery in hand to the conservation commission or its authorized representative or by certified mail, return receipt requested, to said commission, or, if none, to the board of selectmen in a town or the mayor of a city in which the proposed activity is to be located.

Any person filing a notice of intention with a conservation commission shall at the same time give written notification to all abutters within one-hundred feet of the property line of the land where the activity is proposed When a notice of intent proposes activities on land under water bodies and waterways or on a tract of land greater than 50 acres, written notification shall be given to all abutters within 100 feet of the proposed project. Mass. Gen. Laws § 40.

Acting under Mass. Gen. Laws ch. 130, section 52 and the Home Rule Amendment of the Massachusetts Constitution, Falmouth has established its own aquaculture regulations. Aquaculture licenses are granted by the Board of Selectman to an individual who is, for at least six months, been a resident of the Town of Falmouth. Additionally, the applicant must show the Board that they have sufficient experience of knowledge to operate an aquaculture farm. The

applicant must pay for legal advertising required by various boards and agencies that will review the proposal.

The New England District of the Army Corp of Engineers general permit for Massachusetts Appendix L, outlines nine requirements an aquaculture must meet in order to receive a permit.

(1) The area authorized for this activity shall not exceed 10 acres, except where the permittee is a duly authorized municipality, for which the maximum size shall be 25 acres. According to the New England District of the Army Corps of Engineers, the 10 acre limitation is only for a minimal impact project. An individual permit can be obtained, but requires town approval, public notice, comments, and an Environmental Assessment. The activity must comply with Section 404(b)(1) guidelines. Individual towns can apply for this permit and divide the area as they see fit.

(5) No activity shall occur within a distance of 25 feet from beds of eel grass, widgeon grass, or saltmarsh, nor shall such vegetation be damaged or moved.

If eel grass moved into the site after the initial permit was issued the farm does not to be relocated. The Army Corp occasionally does inspections of the site to ensure that the area is marked correctly. If eel grass is found it is only noted in the report and does not change the permit. New growth of eel grass could, however, restrict future expansion of the area.

Since 1979, the Conservation Commission in Falmouth is authorized to regulate aquaculture under The Wetlands Protection Act. Chapter 235-1 of the Town Code (current as of 8/13/2014) allows the Conservation Commission to protect wetlands, water resources, and adjoining lands in Falmouth by controlling activities deemed by the Conservation Commission as likely to have a significant or cumulative impact upon resource area values. A permit from the Conservation Commission is required for aquaculture activities. Section 235-4. In some cases, the Commission could accept an application and plans filed under the Wetlands Protection Act, Mass. Gen. Laws ch. 131, section 40, and Regulations 310 C.M.R. 10.00. In addition to the permit fee, an applicant may be required to pay a consultation fee for but not limited to the resource area survey and delineation, analysis of resource area values, wildlife habitat, hydrogeological and drainage analysis and environmental or land use law. Section 235-4(d)(e).

Applicants must have proof that they notified all abutters of their intended plans. Additionally, notice must be published in a newspaper that a public hearing will be held. The hearing can be combined with the one required under the Wetland Protection Act. Section 235-5(a)(b).

If the Conservation Commission determines that the proposed activity are likely to have an effect on the resource area values they are authorized by section 235-7(a), to deny the permit or impose restrictions to protect the values. The Commission also has the power to deny a permit for but not limited to failure to meet the requirements set forth by this chapter or failure to meet the requirements of the Conservation Commission.

Section 235-8(a) authorizes the Conservation Commission to publicize rules and regulations to enforce this chapter. This section also authorizes the Conservation Commission to create additional rules and regulations consistent with the provisions of this chapter. 235-8(c).

Massachusetts municipalities that currently use block permitting, as suggested in the Massachusetts White Paper and Strategic Plan, are the Town of Dennis off of Crowes Pasture, the Town of Wellfleet on Egg Island, the Town of Eastham off of Boat Meadow and First Encounter Beach. Block permitting on Crowes Pasture constitutes 32 separate 1 acre tracts.

The Town of Eastham has twenty half-acre sites designated for aquaculture. A half-acre expansion site is located next to each site. A person must have a commercial aquaculture permit in order to obtain an aquaculture license. After two years, a licensee can request from the Board of Selectman expansion of their site pending a review by the Natural Resources Department, but an aquaculture facility cannot exceed two acres total.

The Town of Wellfleet has a comprehensive regulatory system for issuing aquaculture licenses for pre-surveyed areas already subdivided by the town. Under Mass. Gen. Laws ch.130 authority, the Board of Selectman authorize the issuance of aquaculture licenses. Town of Wellfleet Shellfishing Policy and Regulations Section 7. Shellfish Aquaculture (Current as of 8/5/2014).

- ❖ The town will only issue grants to domiciled residents who have held a Wellfleet commercial shellfishing license during two of the last three years or who can demonstrate experience in aquaculture. 7.8.1.
- ❖ Grants are limited to seven acres total, but areas greater than seven acres that existed before August 1, 1993 can continue operation if adhering to the existing conditions for the license. Holders of licenses for areas greater than seven acres will not be allowed to license more acreage. 7.8.5., 7.8.6.
- ❖ The town also has special licenses for aquaculture research and development for individuals, institutions, and corporations. All data and results must be made available to the Board of Selectman, the Shellfish Constable, and the Division of Marine Fisheries. All excess, unused product resulting from the licensed area must be returned to the town. 7.8.7.1, 7.8.7.4, 7.8.7.5.
- ❖ Minimum production levels must be met. For the first three licensed years a minimum of \$1000 per acre must be spent on seed and gear for the area. Areas less than one acre shall be prorated. During the fourth year and every year thereafter there shall be a minimum production of \$1000 worth of product per year per acre. Failure to meet production could result in loss of the licensed area. 7.12.1.
- ❖ Occasionally the DMF and the Board of Selectman will allow holders of concurrent aquaculture licenses and seed permits to take oyster seed from specified areas. 7.15.2.

The National Shellfish Program (NSSP) represents the federal Food and Drug Administration's recommendations for the safe and sanitary handling of shellfish. The NSSP is not controlled by federal law however, via the states relationship with the Interstate Shellfish Sanitation Conference, the states have agreed to enforce Model Ordinance as the minimal requirements for the sanitary control of shellfish.

Section I (8) defines the "Authority" as the state or local control authority who is responsible for the enforcement of this code.

A. Scope. The Authority shall establish a statewide shellfish safety and sanitation program to regulate: (1) The classification of shellfish growing areas; (2) The harvesting of shellfish; (3) Shellfish processing procedures and facilities; and (8) Bivalve aquaculture.

B. State Laws and Regulations. The Authority shall have laws and regulations which provide an adequate legal basis for the safety and sanitary control of all program elements including but not limited to the elements outlined in A.

Chapter IV. Shellstock Growing Areas (The Authority must meet the requirements of this section even if the Authority does not formally adopt this chapter.)

A. Sanitary Survey

(1) The sanitary survey is a written evaluation report of environmental factors, including actual and potential sources of pollution, which may affect water quality in growing areas.

B. Sanitary Survey Required

(1) A sanitary survey is not required to classify a growing area as prohibited. The findings of a survey may result in an area being classified as prohibited.

(2) A sanitary survey of each growing area shall be required to prior to:

(a) The harvest of shell stock for human consumption

(b) The classification of a growing area as approved, conditionally approved, restricted, or conditionally restricted.

C. Sanitary Survey Performance

(a) A sanitary survey of each growing area shall be performed at least once every 12 years.

(b) When a report is not complete, the area shall be placed in a closed status.

(c) The growing area classification and the data from the survey shall be reported at least every 3 years.

D. Shoreline Survey Requirements

(1) The Authority shall:

(a) Identify all actual and potential sources of pollution that may affect the growing area;

(b) Determine the distance from pollution sources to the growing area and the impact each source will have on the area;

(c) Assess sewage and other waste treatment systems;

(d) Determine if poisonous or deleterious substances adversely affect the growing area; and

(e) Consider the presence of domestic, wild animal, or bird populations for possible adverse effects on growing areas.

Growing Area Classification

Each growing area shall be correctly classified as approved, conditionally approved, restricted, conditionally restricted, or prohibited. Classification of All Growing Areas. All growing areas which:

(a) Are not subjected to a sanitary survey every 12 years shall be classified as prohibited;

(b) Have a sewage treatment plant outfall or other point source of pollution within or adjacent to the growing area shall have an area in the prohibited classification established adjacent to the point source.

(c) Are subjected to a sanitary survey shall be classified based on the 12 year sanitary survey, and its most recent triennial evaluation, as one of the following: approved; conditionally approved; restricted; conditionally restricted; or prohibited.

Revision of Classifications

- (a) Any upward revision of a growing area classification shall be supported by an adequate sanitary survey.
- (b) The FDA regional office shall be notified of any revision in the growing area classification.

Status of Growing Areas. The status of a growing area is separate and distinct from its classification and may be open, closed, or inactive for the harvesting of shell stock.

- (a) Open Status- Except for a prohibited area is normally open for the purposes of harvesting shell stock, subject to the limitations of its classification.
- (b) Closed Status-Any classified growing area may be closed for a limited or temporary period because of contamination.

Restricted Classification

A growing area may be classified as restricted when: a sanitary survey indicates a limited degree of pollution; and Levels of fecal pollution, human pathogens, or poisonous or deleterious substances are at level where shell stock can be made safe for consumption by relaying, depuration or low acid-canned food processing. The Authority shall have control to ensure that shellfish are harvest from restricted areas only: By special license; and under the supervision of the Authority.

Prohibited Classification Exception

The prohibited classification is not required for harvest waters within or adjacent to marinas. The Authority may use the prohibited classification for these areas. The Authority shall:

- (a) Not permit the harvest of shellfish from any area classified as prohibited, except for the purpose of gathering seed for aquaculture or to deplete the areas classified as prohibited; and
- (b) Ensure that shellfish removed from any growing area classified as prohibited are excluded from human consumption unless it is seed for aquaculture.

Sanitary Survey

A growing area shall be classified as prohibited if no sanitary survey exists

A sanitary survey determines:

- (a) The growing area is adjacent to a sewage treatment plant or other point source;
- (b) Pollution sources may unpredictably contaminate the growing area;
- (c) The growing area is contaminated with fecal waste
- (d) The concentration of biotin is sufficient to cause a public health risk; or
- (e) The area is contaminated with poisonous or deleterious substances causing the shellfish to be adulterated.

Risk Assessment

A growing area shall be classified as prohibited if a risk assessment performed indicates the shell stock are not safe for human consumption.

Potential Areas for Increased Efficiencies in Aquaculture Permitting

Federal agencies are working on additional ways to achieve more efficient permitting of commercial shellfish aquaculture, including:

1. Preparing Programmatic Biological Opinions for more efficient aquaculture permit reviews related to ESA compliance.
2. Researching and making available existing aquaculture best management practices (or BMPs) that can be used by aquaculture applicants during project planning and in discussions between federal agencies during consultations.
3. Drafting a “Shellfish Grower’s Introduction to Permitting” document to facilitate submittal of more complete permit applications, reducing the applicant’s wait time between original submittal and permit decision.

Appendix D. Falmouth Aquaculture Permitting Process

In order to be considered for an aquaculture license, the Town of Falmouth requires an individual show they have the skills and experience needed to operate a successful shellfish farm and the applicant must be a resident of Falmouth for at least six months prior to applying for a license.¹⁵ In addition, the Massachusetts Division of Marine Fisheries (DMF) requires a potential aquaculturist to obtain a commercial state saltwater fishing license and a local shellfishing permit.¹⁶ After meeting the prerequisites, Mass Gen. Laws ch. 130 § 57 require an applicant to identify a potential site for the farm and construct a plan that demonstrates the intended project. Generally, municipalities then have their local shellfish constable review the plan before the applicant can formally apply for an aquaculture license.

Section 60 of Chapter 130 requires the applicant to pay for legal advertising announcing a public hearing in which numerous town boards and agencies will review the proposal. Additionally, under the Massachusetts Wetlands Protection Act, (WPA) the applicant is required to file a Notice of Intent with the town's conservation commission who has the authority, under the WPA, to regulate aquaculture.¹⁷ Section 40 also requires any person filing a Notice of Intent with the conservation commission to notify all abutters within one-hundred feet of the proposed aquaculture site. Additionally, the applicant can also choose to complete a Request for Determination of Applicability form to determine the applicability of the WPA on a proposed site and identify the need for more permits.¹⁸ Falmouth complies with Chapter 131 and, in some cases, will accept notice and a hearing conducted under the WPA as satisfying the requirement.¹⁹

Under Falmouth's Town Code Chapter 235. Wetlands Protection, an applicant must pay a consultant fee for costs and expenses incurred by the commission for consultation services related to potential environmental concerns, resource area values, wildlife habitat evaluations, engineering services, delineation, land use law and any other consultation services considered necessary by the Conservation Commission.²⁰ Ultimately, if the Conservation Commission determines the aquaculture site is likely to have a negative effect on the resource area values, they are authorized by section 235-7(A), to deny the permit or impose restrictions. If the outcome of the consultations, public hearing, and determination for additional permits is positive, the town will issue the aquaculture license and the applicant can then apply for a permit from the DMF.

The DMF issues Special Project permits for aquaculture activities.²¹ The permits are designated into a specific class and type, depending on the proposed project. For example, a typical open water aquaculture system, with minimal structures, would require a Type 1, Class 3 permit.²² The permit applicant needs to provide the DMF with: a detailed site plan, geophysical characteristics

¹⁵ Falmouth, Mass., Code ch. 275, Art III, Aquaculture Regulations (1996).

¹⁶ Massachusetts Aquaculture Advisory Group, Massachusetts Department of Food and Agriculture, Permits Guidance Document 8 (1998).

¹⁷ Mass. Gen. Laws ch. 131 § 40 (2014).

¹⁸ Id.

¹⁹ Falmouth, Mass., Code Ch. 235-4 (2014).

²⁰ Id.

²¹ 322 C.M.R. 7.01(4) (2014).

²² 322 C.M.R. 15.04(3) (2014).

of the site, benthic habitat conditions, proposed cultured species and quantities, any physical structures, a municipal shellfish aquaculture license or conditional approval, a municipal wetlands permit (or non-applicability determination), an application for Army Corp of Engineers section 404 permit, and a transcript of the local public hearing.²³

Next, the application is subject to a review by the DMF, as well as various other state agencies, to identify any potential negative effects the aquaculture project may have on the site.²⁴

Generally, areas that are subject to investigation include, but are not limited to: water quality, exposure of structures, growing area classification, submerged aquatic vegetation, other uses of the area, navigation, the presence of marine mammals, and endangered species.²⁵ At any time during the process, the DMF can alter the plan, impose conditions, require additional permits, or simply deny the application.

After the application is approved at the state level, the applicant can apply for an Army Corp of Engineers Massachusetts General Permit for projects up to ten acres that meet the Aquaculture Guidelines in Appendix L of the General Permit.²⁶ For projects in excess of ten acres, or those that do not follow Appendix L of the Guidelines, the applicant must apply for an Individual Permit.²⁷ The Army Corp reviews the proposed activity alongside other state and federal agencies to ensure the project will have a minimal impact on the aquatic environment.²⁸ If the Army Corp, in conjunction with the other agencies, determines the project will have more than a minimal impact on the environment, then the application is either subject to more permits or denied.

²³ 322 C.M.R. 15.05(c).

²⁴ 322 C.M.R. 15.06(1).

²⁵ *Id.*

²⁶ Department of the Army, General Permit, Commonwealth of Massachusetts Appendix A 7-8 (2012).

²⁷ *Id.* at 5.

²⁸ *Id.* at 4.



Oyster farm west of Barnstable Harbor, MA – google earth image