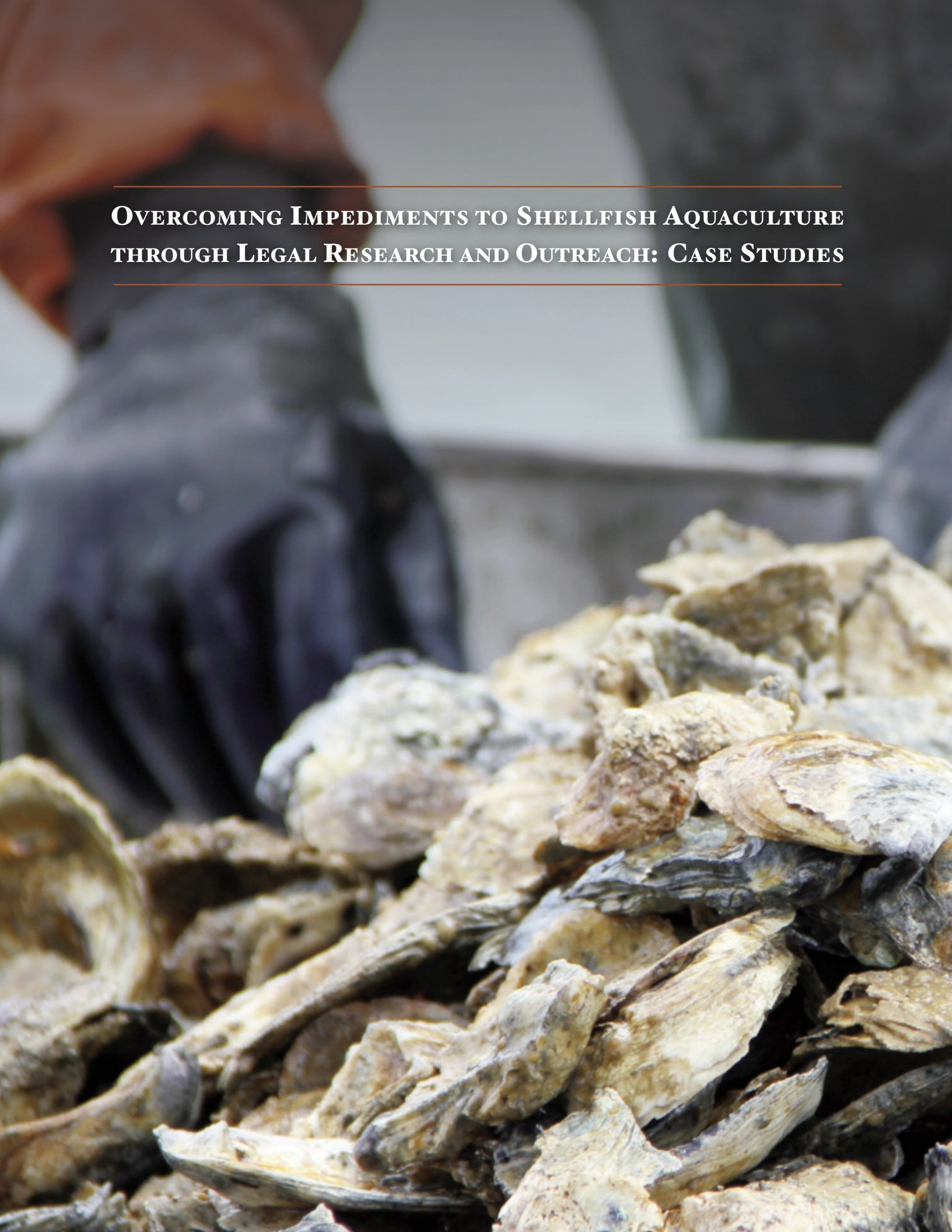

Overcoming Impediments to Shellfish Aquaculture through Legal Research and Outreach: Case Studies

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Cover photo courtesy of the Chesapeake Bay Program

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Introduction

More than half of the population of the continental United States resides in coastal communities, which are increasingly home to commercial shellfish aquaculture operations. Consequently, a variety of user conflicts can arise as states seek to encourage the development or expansion of shellfish aquaculture. Each of these conflicts creates the potential for opposition and legal challenges to the industry.

An understanding of the legal and regulatory context governing shellfish aquaculture can assist in managing conflicts related to the industry. Laws and regulations in some cases create or can be perceived as impediments to the growth or success of the aquaculture industry. However, federal, state, and local legal frameworks reflect public policy choices about the multiple uses of submerged lands. Research and outreach focusing on the regulatory barriers to shellfish aquaculture can increase understanding of current legal structures and identify alternative policy options to more effectively manage submerged lands as well as the industry.

In 2017, the National Sea Grant College Program funded a multi-institutional, national collaboration to examine legal impediments to shellfish aquaculture across the United States. Project partners include attorneys from the National Sea Grant Law Center, University of Mississippi School of Law; Rhode Island Sea Grant Legal Program, Roger Williams University School of Law; Virginia Coastal Policy Center, William & Mary Law School; Carl Vinson Institute of Government, University of Georgia; and the California Sea Grant Program.

In collaboration with shellfish industry members and the wider Sea Grant network, the Project Team identified eight priority legal and policy barriers or success stories that would benefit from the development of case studies. The identified topics for the case studies were:

- Impact of Endangered Species Act listings;
- Nationwide Permit 48;
- Access to public boat launches;
- Access to nursery upweller sites;
- Permitting process in Virginia;
- Use conflicts on the Lynnhaven River, Virginia;
- Gaps in Georgia's permitting program; and
- Certification of shellfish growing areas in federal waters.

Drafts of the case studies were presented at two industry conferences in 2018 to solicit feedback and input from industry members. A half-day workshop was held at Aquaculture America '18 on February 20, 2018 in Las Vegas, Nevada. Approximately 50 individuals participated in the workshop. A panel presentation at the National Shellfisheries Association annual meeting in Seattle, Washington on March 19, 2018 was attended by approximately 40 participants. Case study drafts were also reviewed by relevant agency staff and key stakeholders.

Although the issues and context in each case study are unique, a few common themes emerged from the Project Team's work.

- The combination of federal, state, and local regulation of shellfish aquaculture can result in a complex matrix of permitting requirements that can vary among states and regions.

- Partnering early with relevant state, federal, and local agencies, before submitting a permit application, can help operators identify and understand potential impediments to a project before spending resources preparing the application.

- Stakeholder engagement by the operator of a proposed facility during the siting and permitting phase is important in order to identify, understand, and respond to any community questions or concerns.

- Regulatory barriers do not solely impact the establishment of new aquaculture operations through permitting. Existing shellfish aquaculture businesses can also face legal issues related to their ongoing operations.

The full text of the case studies can be found following this introduction. A brief summary of each case study is provided below.

Case Study Summaries

<u>The Effects of the Endangered Species Act on Shellfish Aquaculture in New Jersey</u>

The lower Delaware Bay shoreline in Cape May County, New Jersey, serves as the center of a recovering oyster aquaculture industry with historic roots. Delaware Bay is an important stopover location for migratory shore birds, including the red knot. In 2015, the red knot was listed as a threatened species under the federal Endangered Species Act of 1973 (ESA). The ESA is a broad mandate for species and habitat protection, and the statute's provisions can have major implications for both new and established aquaculture operations. In areas where ESA-listed species are present, prospective farmers may have trouble securing the necessary permits and approvals needed to get a farm up and running due to the potential impact on the species in question. Established operations can be significantly impacted if a species is newly listed in the area, as highlighted by the red knot listing in New Jersey. The ESA itself and the manner in which the different sections work together can be confusing for those who are unfamiliar with the Act's terms. This case study provides an overview of the listing (Section 4), consultation (Section 7), and take (Section 9) provisions of the Act. Further, it details how the listing of the red knot impacted the federal permitting of aquaculture operations on the New Jersey coastline, as both Section 7 consultation, which applies to the actions of federal agencies, and Section 9 take, which applies to the actions of any person, came into play.

Shellfish Aquaculture Permitting Under NWP 48

Shellfish aquaculture operations are subject to federal regulations—namely, the Clean Water Act and the Rivers and Harbors Act. In January 2017, the U.S. Army Corps of Engineers renewed and reissued each of its nationwide permits, or NWPs, under these statutes. NWPs are intended to provide a quicker and less complex means to permit activities that cause only minimal individual and cumulative impacts. This case study focuses on Nationwide Permit 48, which authorizes commercial shellfish aquaculture activities taking place in waters of the United States. While NWP 48 provides a streamlined federal permitting process for commercial shellfish operations, it is not as simple as it may seem on the surface. Permitting processes vary from region-to-region and from state-to-state. Furthermore, even if applicants are successfully granted a shellfish aquaculture permit by the Army Corps, state agencies can impose additional requirements under state law that might delay or prevent a project from moving forward. This case study examines such permitting and operational barriers in order to exemplify that NWP 48, while useful in streamlining the federal permitting process, is not always the final answer.

Overcoming Impediments to Shellfish Aquaculture: Access to Public Boat Launches

Access to public boat launches can be important to the success of shellfish growers in Rhode Island. Many public boat launches are constructed using federal funding for the primary purpose of supporting recreational use for the general public, and federal law requires that states ensure they remain available for recreational use. To protect public launches for recreational uses, some states limit or prohibit their use for commercial purposes. In the absence of accessible private alternatives, growers in these states may face increased costs and other difficulties in accessing their leases on a daily basis. Imposition of similar restrictions in Rhode Island would pose a challenge to state growers. This study considers state laws and regulations governing shellfish grower access to public boat launches in coastal U.S. states. It identifies three primary approaches to the commercial use of public boat launches that are available to Rhode Island: (1) implicit or explicit authorization; (2) silence; and (3) prohibition for commercial use, with limited exceptions. Rhode Island law is currently silent on this issue, but may wish to consider other models summarized here if state boat launches become more congested in the future.

Legal Influences on Shellfish Aquaculture Nursery Facility Siting in Rhode Island

Nursery facilities are a critical component of the shellfish production process. Limitations on appropriate nursery sites, therefore, could become an important constraint on the industry in the future. This case study examines how Rhode Island law affects shellfish nursery facility siting. It identifies both impediments to and support for nursery facilities in the state. Siting of floating gear, including nursery facilities such as floating upweller systems (FLUPSYs), is prohibited by lease terms at many oyster farms. As a result, nurseries must often be located in other areas, which may require pathogen testing prior to transfer of seed to the grow-out site. On the other hand, siting of nurseries at residential docks and marinas qualifies for streamlined permitting from the Coastal Resources Management Council, which governs the use of coastal waters. The Department of Environmental Management, Rhode Island's water quality regulator, has established regulations allowing culture of shellfish seed in restricted and conditionally restricted waters—a classification that often applies to

marinas—provided that the seed is transferred before reaching a maximum size. Finally, siting of nursery facilities on or attached permanently to land may be more challenging, as these facilities are subject to additional oversight, including by local land use authorities and may require water quality permits. In sum, Rhode Island has provided growers with effective legal tools to site nursery upwellers in marinas and at docks with minimal process, and these tools are often necessary to enable the use of modern nursery techniques such as the use of FLUPSYs.

Guidance Materials on Starting or Expanding an Aquaculture Operation in Virginia

The Virginia Coastal Policy Center (VCPC) conducted interviews with aquaculture specialists, regulators, industry representatives, scientists, and nonprofit organizations to identify priority law and policy barriers affecting the shellfish aquaculture industry within Virginia. Based on this feedback, it was determined that the best way to assist individuals with navigating the overarching framework of bottomland leasing and permitting in the Commonwealth would be to create easy to use guidance materials. Rather than creating a traditional guidance document, the VCPC developed an electronically available interactive flow chart "how to guide" that maps out the necessary steps to establish an aquaculture operation. The flow chart is interactive in that, at different decision points within the chart, hyperlinks enable the user to access one-page PDF summaries expanding on more complex topics. These topics include: the statutory and regulatory framework for aquaculture in Virginia; how to select a good location for an aquaculture operation; different types of oyster ground leases and aquaculture permits; how to mark a lease area; required training, licenses, and user fees; and other considerations associated with the aquaculture industry. This case study discusses the process VCPC engaged in to solicit stakeholder feedback and develop the interactive guide and associated one-page summaries.

Managing Use Conflicts on the Lynnhaven River

Located entirely within the City of Virginia Beach, the Lynnhaven River is the largest tidal estuary in Virginia. The densely populated, urban area includes public access points, marinas, boat launch facilities, waterside restaurants, and First Landing State Park. Historically, the Lynnhaven was a bountiful oyster-producing tributary; however, water quality concerns started to take a toll as early as 1930 when part of the River was closed to shellfish harvesting. Water quality issues continued with the Lynnhaven being listed as impaired under Section 303(d) of the Clean Water Act in 1988. As a result of regulatory action and local stakeholder engagement, water quality within the Lynnhaven improved and portions of the River opened to shellfish harvesting in 2007—the first commercial harvest in decades. Increases in Virginia Beach's population along the waterfront, coupled with the growth of nearshore aquaculture operations as the River reopened to shellfish harvesting, led to conflicts concerning the use of the River. Growing conflicts led to the development of aquaculture-related legislative proposals, oyster ground lease moratoriums, and the creation of use conflict workgroups. This case study focuses on the relationship between aquaculturists, homeowners, the state regulatory agency, and legislators in Virginia. After providing background behind the conflicts on the River, it summarizes attempts to provide resolution, discusses the handling of similar use conflicts in other parts of the country, and provides recommendations for next steps in dealing with the conflicts.

Growing Oysters in Georgia: An Overview of the Legal Framework

In the early 20th century, Georgia led the nation in producing oysters with more than eight million pounds harvested annually primarily for the canning industry. Until the 1930s, Georgia led the country with 13 canneries, but production plummeted in the 1950s. Oysters were then primarily sold as a canned product until the mid-1960s when Georgia's last oyster shucking house closed its doors. While over-harvesting and fisheries mismanagement were the primary causes of the oyster industry's decline in Georgia, market demand for canned oysters also changed. Tastes have shifted from canned oysters to oysters on the half-shell, and "single oysters" required for half-shell production do not grow naturally in Georgia. Georgia oyster beds are found in the intertidal zone, which is the area between the local high tide and low tide marks, where they grow in muddy clumps with brittle shells having sharp edges. Clumped oysters work well for oyster roasts and canning, but the high-end restaurant market demands single oysters to sell on the half-shell. Fortunately, marine aquaculture techniques can allow single oysters to be grown in Georgia. This case study provides a brief overview of Georgia's regulatory framework relating to the commercial harvesting of shellfish in order to provide the context for the opportunities and challenges facing the state as it works to grow Georgia oyster aquaculture. It then focuses on some of the challenges and opportunities facing stakeholders and policymakers, concluding with possible ways to promote best practices and economic development of the oyster industry.

Molluscan Shellfish Aquaculture in Federal Waters of the U.S. Exclusive Economic Zone

Development of commercial marine aquaculture in federal waters of the U.S. Exclusive Economic Zone (EEZ) has been constrained by an unclear regulatory process and the technical challenges of operating in an offshore environment. This case study provides background information on the aquaculture permitting process in the EEZ, and highlights an important aspect of operations—compliance—to shellfish growers and investors considering operating in federal waters of the EEZ. This story is told using Catalina Sea Ranch (CSR), a farm based in Southern California that currently farms Mediterranean mussels, as an example. After researching CSR's journey from project proposal to operations and interviewing representatives from industry and regulatory agencies, California Sea Grant identified that a key challenge to the domestic production of molluscan shellfish in federal waters of the EEZ is compliance with the National Shellfish Sanitation Program (NSSP). The NSSP is a comprehensive program focused on the assessment of pollution sources, water quality standards for the classification of growing areas, and the shipping and handling of molluscan shellfish through a Model Ordinance. For current and prospective shellfish growers interested in ventures in federal waters of the EEZ, understanding NSSP requirements in the context of operating in federal waters of the EEZ and how federal agencies and the Interstate Shellfish Sanitation Conference are working with industry to meet them is as important as understanding how to navigate the permitting process. This case study provides information on the NSSP requirements as well as the permits needed to operate a molluscan shellfish aquaculture farm in federal waters of the EEZ.

The Effects of the Endangered Species Act on Shellfish Aquaculture in New Jersey

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January 2019

The Endangered Species Act (ESA) can present a regulatory hurdle for both new and established aquaculture operations. If a species is already listed in the area, a prospective farmer may have trouble securing the necessary permits and approvals needed to get a farm up and running due to the potential impact on the species in question. The ESA can also have implications for established aquaculture operations if a species is newly listed in the area. These implications are illustrated by a recent controversy in New Jersey, where the listing of the red knot as a threatened species affected federal permit renewals for existing oyster farms.

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The Oyster Industry and Red Knots in New Jersey

The lower Delaware Bay shoreline in Cape May County, New Jersey, serves as the center of a recovering oyster aquaculture industry with historic roots dating back through generations of local bayside oyster fishermen. The cultivation of the oyster in New Jersey dates back to the 1800s, and the farming of the eastern oyster was once extensive in the state. However, due to the onset of a disease affecting the oyster, oyster aquaculture in the state substantially declined in the 1950s. As a result of the development of disease resistant hatchery-reared oyster seed in the late 1990s, oyster aquaculture is on the rise once again in the state. Contemporary oyster farming is a relatively small, but growing, industry in New Jersey. In 2016, nineteen farms sold 2,029,500 oysters with a farm gate value of $1,370,060.[1]

Shellfish aquaculture can be both (1) non-structural, traditional, on-bottom shellfish culture or (2) structural. Structural aquaculture uses gear to contain seed oysters as they are raised for cultivation purposes, and these structures, including rebar racks, mesh bags, cages, and floats, all need permits from the U.S. Army Corps of Engineers (Corps) and the State of New Jersey. New Jersey allows structural aquaculture to occur on the Delaware Bay by way of riparian grants, private leases, or an Aquaculture Development Zone lease.[2]

To promote the development of oyster aquaculture in New Jersey the State developed an Aquaculture Development Zone (ADZ) in the mid-2000s. The ADZ is intended to ease permitting burdens on potential oyster farms and locate farms in areas with the fewest use conflicts. The ADZ is meant to streamline the permitting process for farmers, as the New Jersey Bureau of Shellfisheries obtains the necessary permits from the Corps and relevant state agencies on behalf of the individual growers. Grouping multiple aquaculture farms allows the state to manage aquaculture operations effectively, as well as help harvesters share upland access to farms, and access seed, equipment, and technical support for their farms.

In addition to being home to an oyster industry, Delaware Bay is an important stopover location for migratory shore birds, including the red knot (*Calidris canutus rufa*). Red knots

1. Lisa Calvo, Rutgers N.J. Agric. Experiment Station, New Jersey Shellfish Aquaculture Situation and Outlook Report 2016 Production Year 3 (2018).
2. U.S. Fish & Wildlife Serv., Biological Opinion on the Effects of Existing and Expanded Structural Aquaculture of Native Bivalves in Delaware Bay, Middle and Lower Townships, Cape May County, New Jersey on the Federally listed Red Knot (Calidris Canutus Rufa) 31 (2016) [hereinafter BiOp].

are truly fascinating birds – the birds can fly thousands of miles before stopping and travel up to 19,000 miles annually, completing one of the longest migration distances in the animal kingdom. In order to make these long-distance flights, the birds accumulate large fat stores and eating at their stopover points is a vital part of their migration. Delaware Bay is the final Atlantic stopover point for 50-80% of red knots before flying north to complete their 5,000-mile migration to the Arctic.

The red knot was listed as threatened under the ESA on January 12, 2015. This listing has implications for both the red knot itself and activities in its range that may affect the bird. In fact, the red knot's listing has already impacted the oyster industry in New Jersey. How the ESA works and why the oyster industry in New Jersey was impacted by the Act's terms are discussed more fully below.

The Endangered Species Act

Congress passed the ESA in 1973 to protect both imperiled species and their ecosystems, declaring that the Act's purpose is to provide a framework that conserves "the ecosystems upon which endangered species and threatened species depend" and establish "a program for the conservation of such endangered species and threatened species."[3] Further, the goal of the Act is to recover a species to the point where the protections of the Act are no longer necessary.[4]

The ESA is administered by the U.S. Fish and Wildlife Service (FWS) in the Department of the Interior for terrestrial species and by the National Marine Fisheries Service (NMFS) in the Department of Commerce for listed marine species. Once a species is listed as endangered or threatened under Section 4 of the ESA, the Act's other provisions, such as Section 7 consultation and Section 9 take, come into play.

Section 4 Listing

Section 4 of the ESA lays out how a species can be listed as either endangered or threatened under the Act. The Act defines endangered species as "any species which is in danger of extinction throughout all or a significant portion of its range."[5] A threatened species is "any

3. 16 U.S.C. § 1531.
4. *Id.* § 1532(3).
5. *Id.* § 1532(6).

species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range."[6] When making listing determinations, the Act directs the Secretary to take several factors into account, including whether the species' habitat or range is presently or threatened to be destroyed, modified, or curtailed or if the species is being overutilized. In addition, in making a listing determination, the Secretary must only consider "the best scientific and commercial data available."[7]

A species can be listed either by the action of the agency on its own or pursuant to a public petition. For the red knot, FWS began to receive petitions to list the species starting in 2004, and the agency received additional petitions in 2005 and 2008. The FWS finally determined to list the red knot as a threatened species pursuant to a 2011 settlement agreement between the agency and the Center for Biological Diversity. The listing became effective on January 12, 2015.

The red knot ESA listing in 2015 triggered certain federal protections under the ESA, including prohibiting the "take" of the species and requiring consultation with the U.S. Fish and Wildlife Service (FWS) for any actions taken by the federal government, such as the issuance of a federal permit, that could "jeopardize" the species.

In addition, once a species is listed, the Act directs either FWS or NMFS to designate "critical habitat," which are areas that are "essential for the conservation of the species," but usually does "not include the entire geographical area" that the species could occupy.[8] Critical habitat provides greater protection to the species. Altering critical habitat can contribute to a take under Section 9, and altering habitat also must be consider in Section 7 consultation.

Although the plain language of the ESA mandates the designation of critical habitat by FWS or NMFS, there are many species protected by the ESA for which critical habitat has not been designated. The FWS has not designated critical habitat for the red knot. In fact, critical habitat has not been designated for any listed species in New Jersey. Thus, the additional protections afforded to a species through the designation of critical habitat is not yet available to the threatened red knot.

6. *Id.* § 1532(20).
7. *Id.* § 1533(b)(1)(A).
8. *Id.* § 1532(4).

Section 7 Consultation

Section 7, as codified in 16 U.S.C. § 1536, applies to the actions of federal agencies. Section 7 aims to ensure that any proposed action by the agency "is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of" critical habitat.[9] In essence, the provisions are meant to prevent the federal government from putting a listed species in jeopardy of extinction. Section 7 requires federal agencies to consult with either the FWS or NMFS, depending on the species, on any agency action likely to result in jeopardy to a species or adverse modification of critical habitat.[10]

There are some parameters for when Section 7 applies. Section 7 only applies to federal actions, which are actions "authorized, funded or carried out" by the federal government. Further, consultation only applies to "actions in which there is discretionary federal involvement or control."[11] Although the consultation requirement applies to all listed plant and animal species and all designated critical habitat, the section only requires consultation if a federal action will jeopardize the species as a whole, not simply individual members of the species.

The potential impacts of a proposed federal action on the listed species or its habitat is assessed through an administrative process known as consultation. Consultation is a two-step process: informal and formal consultation. Informal consultation is an optional process that can be used to determine whether formal consultation is needed. If any listed species are present in the area of the proposed action, and it is possible that the proposed action "may adversely affect" listed species or its critical habitat, then formal consultation is required.

Once consultation is initiated, the ESA prohibits "any irreversible or irretrievable commitment of resources with respect to the agency action."[12] During the process, the agency proposing the action ("action agency") works with the "expert agency" – either FWS or NMFS – to determine whether its action will jeopardize the species or adversely modify its habitat.

If formal consultation is needed, the appropriate expert agency will produce a Biological Opinion based on information provided by the action agency. The action agency must provide

9. *Id.* § 1536(a)(2).
10. *Id.* § 1536(a)(4).
11. 50 C.F.R. § 402.03.
12. 16 U.S.C. § 1536(d).

the "best scientific and commercial data available … for an adequate review of the effects that an action may have upon listed species or critical habitat."[13] The Biological Opinion, or BiOp, will consider if the action and its cumulative effects are "likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat."[14] If the answer to this question is yes, the expert agency must formulate Reasonable and Prudent Alternatives (RPAs) that can be implemented by the action agency to avoid jeopardizing the species or harming its critical habitat.[15]

Once the expert agency issues the Biological Opinion, the consultation process is ended. If no jeopardy is found, the project may advance. If the activity will result in some take of the species, the Biological Opinion likely will include an Incidental Take Statement. If the BiOp contains a jeopardy determination, the action agency has three options: it can terminate the action, implement the RPAs, or seek an exemption from the Cabinet-level Endangered Species Committee (known as the God Squad).[16]

The scope of the Biological Opinion is limited to the proposed agency action. Thus, while there may be multiple stressors on a listed species' survival, the BiOp can only address actions under the control of the permitting agency. For example, if agricultural runoff is harming a listed species' habitat, but the action agency is getting a renewed permit for a Corps dam, only the impacts from the dam operations are considered in the BiOp, as the expert agency has no authority to dictate actions to another agency not party to that BiOp.

The Red Knot Biological Opinion

As required by the ESA, FWS, as the expert agency, developed a Biological Opinion for structural aquaculture operations in portions of the Delaware Bay in Cape May County, New Jersey for the Corps, the action agency.[17] The consultation was triggered by the issuance of permits by the Corps to the state of New Jersey for structural aquaculture in ADZ areas. The BiOp considered the potential impacts on the threatened red knot by the Corps' permits. The red knot BiOp is programmatic, meaning that this initial BiOp looks at the overall Corps'

13. 50 C.F.R. § 402.14(d).
14. *Id.* § 402.14(h).
15. *Id.* § 402.02.
16. 16 U.S. C. § 1536(e).
17. BiOp, *supra* note 2.

program for certain ADZ areas in Delaware Bay. It includes an Incidental Take Statement (ITS) for some existing oyster farms (See Section 9 discussion below). The FWS and Corps will engage in streamlined consultations as individual permits to farmers are needed under the program.

The BiOp found the Corps permits would not result in jeopardy to the birds or adversely affect their critical habitat (as none has been designated).[18] However, the BiOp does require certain actions, known as Conservation Measures (CMs), that the aquaculture farmers must taketo reduce the potential harm of oyster farming on the red knot population. The BiOp states the CMs are non-discretionary actions that aim "to benefit or promote the recovery of" the red knot and are "an integral part of the proposed action…and serve to minimize or compensate for project effects" on the red knot.[19] Among other things, the CMs limit gear placement, farm work hours, and access to all farms, and have resulted in the closure of one farm site and the targeted relocation of a second. The oyster industry in New Jersey is concerned that these measures are not necessary to protect the birds and will ruin the industry. The industry asserts that the oyster farms and red knots interactions are minimal as the farms occur along less than a mile of the roughly one hundred-mile Delaware Bay shoreline that red knots frequent. Furthermore, buffers around farms are in place to enhance red knot protections.

Although the BiOp covers ten years of operations, it does include the opportunity for adaptive management as new scientific information emerges. The agencies are directed to meet at least annually to review any new science. The BiOp allows, but does not require, the CMs to be adjusted accordingly. While the agencies must meet to discuss any new scientific understanding, the BiOp does not mandate that the CMs be adjusted.[20]

Section 9 Take

The ESA defines *take* to mean "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."[21] The prohibition against taking a listed species, found in Section 9 of the ESA[22] applies to any person subject to the jurisdiction of the United States, including businesses and governmental units. Both lethal and non-lethal

18. *Id.* 130.
19. *Id.* 150.
20. *Id.* 50.
21. 16 U.S.C. § 1532(19).
22. *Id.* § 1538.

actions can constitute a "take" under the statute. Further, the agencies have defined both "harass" and "harm" through regulations to include activities that interrupt a creature's essential life functions of breeding, feeding, or sheltering. Therefore, "take" includes many more actions than actually killing an individual member of a listed species.

Under the ESA there can also be what are known as "incidental takings." An incidental take is "any taking otherwise prohibited, if such taking is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity."[23] In other words, when a legal activity has the unintended consequence of harming a listed species, it is described as an incidental take.

The red knot BiOp contained an Incidental Take Statement (ITS) that allows the structural aquaculture industry to impact the red knots up to a certain allowable extent. Thus, certain activities that would otherwise make the aquaculture industry liable for takes under Section 9 are allowed under the ITS. The ITS distinguished between lethal and non-lethal takes, allowing 315 lethal takes from harassment or harm over the ten-year life of the BiOp. The lethal takes are a maximum mortality rate and the FWS did not split up the lethal takes among the individual oyster farms. In comparison, the BiOp does allocate non-lethal takes among certain farms, allocating 644 non-lethal takes to one farm, and 641 to another.

However, for actions not covered by the ITS, the farmers could be liable for a take, even if the take was incidental to the day to day operations of the farm. This means that the farmers could be liable for penalties under Section 10 of the ESA if a red knot was harmed or harassed as a result a farming activity not covered by the ITS. Civil penalties under the Act range from $500-$25,000 for each violation, while criminal penalties can be up to $50,000 or a year in prison. However, depending on the nature of the violation, the actual penalties in a case could be significantly less than the maximum penalty allowed under the Act as the government has significant enforcement discretion.

Moving Forward

Because Delaware Bay is a vital stopover point for a majority of the population of red knots, there is concern with structural aquaculture's direct and indirect effects on the birds, as they need to gain enough weight while foraging there to complete their long migration.

23. 50 C.F.R. § 17.3.

Oyster farmers could scare off red knots just by their presence or by noise. Such distractions could prevent the red knots from feeding. Further, the racks and other equipment could block access to the intertidal zone where the knots feed. In addition, the aquaculture structures could interfere with horseshoe crab breeding activities, which in turn could adversely affect the vital food source – horseshoe crab eggs - of the red knot.

Due to these concerns, several non-governmental organizations petitioned state and federal agencies to stop aquaculture growth and curtail existing activities further out of concern that farm gear and activities may disturb red knots along lower bay beaches during the birds' annual spring migration. Oyster farmers in the Delaware Bay area of New Jersey desire to continue farming in the nearshore intertidal bay area, maintaining their existing 10-acre footprint and enabling carefully planned growth. The farmers, however, wonder whether this is possible given the CMs contained in the BiOp. In fact, multiple farms in the area have already been negatively impacted by the CMs, with one operation shut down and another potentially moving its farm. Therefore, even after the conclusion of the Section 7 consultation process, the two groups continue to debate how the intertidal area of the Delaware Bay should be managed going forward.

Conclusion

As illustrated by the red knot case study, the ESA can have major implications for aquaculture operations. These implications are not limited to intertidal shellfish aquaculture on the Delaware Bay. The ESA interacts with aquaculture operations across the country. For instance, concerns have been raised about the impact of long line aquaculture on listed North Atlantic right whales, as there is potential for the listed whales to get caught up in the lines. Further, the recent decision of Louisiana to allow farming of the Eurasian sterlet sturgeon is controversial due in part to concerns of potential environmental impacts if any of the starlet sturgeon were to escape into the wild. Escaped starlet sturgeon could compete with both the pallid and Gulf sturgeon, both of which are native to Louisiana and protected under the ESA. Similar concerns exist in the Pacific Northwest concerning farmed salmon and the potential impacts of escaped non-native species on the listed, native salmon species in the area. Thus, in areas where species are or could potentially be listed, aquaculture farmers need to be aware of the potential applicability of the ESA to their operations and prepared for additional regulatory oversight.

Shellfish Aquaculture Permitting Under Nationwide Permit 48

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Shellfish aquaculture is a rapidly growing industry with diverse practices that vary with species and location. Shellfish can be grown on the bottom or in the water column using containment systems such as racks, cages, and floating bags. Shellfish farms, when properly designed, sited, and managed, have minimal impacts on the environment and provide significant ecosystem services. However, shellfish wastes can potentially impair water quality under certain growing conditions. Shellfish produce wastes by excreting both feces ("pseudofeces") and ammonia into the water as a result of their particulate filtering abilities. Additionally, if an operation is improperly sited or scaled for a particular location, the impact of the structures in the water column can have adverse social or environmental impacts. Absent any siting or scaling issues, large commercial operations may still adversely affect navigation through the installation of buoys, floats, lines, containers, or other structures in the water.

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As a result of these risks of impairment to water quality and navigation, shellfish aquaculture operations are subject to federal regulations—namely, the Clean Water Act (CWA) and the Rivers and Harbors Act (RHA). To fulfill the purpose of these acts, the U.S. Army Corps of Engineers (Corps) administers permits for commercial shellfish aquaculture activities in state waters. Shellfish farmers are required to secure permits from the Corps in addition to permits or leases issued by an appropriate state or local government agency. In most cases, state permitting or leasing authorities will coordinate permitting activities with the Corps. If an aquaculturist does not first obtain the necessary permissions, they cannot commence operation of their site.

Permitting in General

Under the CWA, the Corps has regulatory authority over activities involving the discharge of dredge and fill materials into navigable waters. Section 404 of the CWA prohibits the discharge of dredged or fill material into waters of the United States (including wetlands) without a permit from the Corps.[1] Thus, those activities that are affiliated with shellfish aquaculture and would result in a discharge of dredged or fill material into waters of the United States (including wetlands) must receive a Section 404 permit from the Corps. Additionally, Section 10 of the RHA prohibits the obstruction or alteration of navigable waters of the United States without a Corps permit. The Corps has combined the permitting process for these two programs.

It is important to note the geographical limits of the Corps' jurisdiction under the CWA and RHA. The Corps requires a permit under Section 10 of the RHA for all structures and work within the territorial seas—those ocean waters within a zone of three nautical miles from shore. Aquaculture operations sited further than three nautical miles from shore are also subject to Corps permitting requirements under other federal authorities if they will include the installation of structures affixed to the ocean bottom and/or artificial islands.[2] The permitting of these offshore operations is outside the scope of this case study. The geographic jurisdiction for the discharge of dredged of fill material extends from three nautical miles landward to the boundary of any wetlands beyond the highest annual tide.

1. 33 U.S.C. § 1344.
2. *See* 43 U.S.C.A. § 1333(a)(2)(A).

The Corps authorizes projects under Section 404 and Section 10 through individual and general permits. However, it is important for aquaculture stakeholders to recognize that regardless of the type of permit, the Corps must also comply with the applicable permitting requirements of other environmental statutes, such as the Endangered Species Act (ESA)[3] and the National Historic Preservation Act. The Corps may require additional information from developers to ensure compliance with these laws, but such processes are not discussed in detail in this case study since they are applicable to any federal action associated with a proposed activity.

Individual, or standard, permits are issued for projects that do not meet the agency requirements for an expedited, general permit as discussed below. The use of individual permits for the authorization of aquaculture activities is regionally specific, and their use is often reserved for aquaculture operations that may have a discernable conflict with existing public water uses including navigation, commercial fishing, or recreation. They may also be utilized if a proposed activity will result in significant impacts to wetlands, streams, and other aquatic resources. Individual permits are more expensive and time consuming to obtain than general permits as the Corps' review of individual permit applications involves a more thorough analysis of the socioeconomic and environmental impacts of the project. This case-by-case evaluation will often require applicants to submit detailed documentation regarding the project's scope, design, construction, and operation.

In addition to the normal application review process, the Corps has developed several types of general permits that authorize common activities that cause only minimal individual and cumulative environmental impacts. General permits expedite the authorization process for projects that have been designed to meet the terms and conditions of the general permit. The Corps uses three types of general permits:

1. Nationwide Permits;
2. Regional General Permits; and
3. Programmatic General Permits.

3. *See generally*, Catherine Janasie, *The Effects of the Endangered Species Act on Shellfish Aquaculture in New Jersey*, *supra* page 6.

The Corps' regulatory program is implemented by 38 district offices. Use of general permits is not uniform throughout the districts. Districts may not use all types of general permits. In addition, some districts have implemented regional restrictions or conditions on using Nationwide Permits. Therefore, when determining if a project meets the terms and conditions of a Nationwide Permit, one must first identify the district in which the project is located and then contact the district or visit the district website to view the regional conditions. District offices can also answer questions regarding the terms and conditions as well as applicability of a certain general permit to a proposed activity. While some general permits do not require any notification to the Corps before use, others may require prior notice to and verification from the Corps.

Nationwide permits (NWPs) authorize activities across the country. There are currently 54 Nationwide Permits authorizing a wide variety of activities including mooring buoys, residential developments, utility lines, road crossings, mining activities, wetland and stream restoration activities, and commercial shellfish aquaculture activities.[4] The Corps renews and re-issues the nationwide general permits every five years, "…to update them, and provide clarity and certainty for the regulated public while protecting the aquatic environment."[5] The most recent renewal was finalized in March 2017. Although NWPs authorize activities on a national level, Corps district commanders may revoke a nationwide permit in a state or other geographic area for various reasons, including specific concerns regarding adverse environmental impacts the implementation of a NWP may impose on an area. States also have some authority to prohibit the application of NWPs, as discussed below. The exercise of this authority can result in a patchwork of NWP coverage across the districts and states of the country.

Regional General Permits (RGPs) are similar in nature, in that they authorize activities causing only minimal individual and cumulative environmental impacts. However, RGPs do so *only* within a specific geographic area. RGPs are proposed by districts, but application procedures can vary from one district to the next. For example, the Baltimore District of the Corps, which includes Maryland and central Pennsylvania within its regulatory boundary, implemented a RGP in 2011 (RGP-1) regulating new commercial, research, and educational bivalve shellfish aquaculture activities in Maryland tidal waters.[6] RGP-1 provided for a more streamlined

4. 33 U.S.C. § 1251.
5. *Army Corps of Engineers Revises and Renews Nationwide Permits,* U.S. Army Corps of Engineers (Jan. 6, 2017).
6. *Special Public Notice # 11-66,* U.S. Army Corps of Engineers, Baltimore District (Aug. 15, 2011).

authorization process for new native oyster aquaculture activities that were being proposed as a result of changes in state aquaculture leasing laws. To qualify for a RGP-1 permit, projects were limited to fifty acres for shell-on-bottom aquaculture sites, five acres for cage-on-bottom sites, and three acres for floating aquaculture activities.[7] Proposed projects greater than those size limits were required to undergo an individual permit process. This RGP has since expired and been replaced with the 2012 language of NWP 48 in addition to revised regional conditions for new and existing commercial shellfish aquaculture activities in Maryland tidal waters. However, the regional conditions for existing commercial aquaculture activities covered under the 2012 NWP 48 in Pennsylvania were allowed to remain unchanged.

Programmatic general permits (PGPs) are based on existing state, local, or other federal programs, and are designed to eliminate redundant efforts between Corps districts and state regulatory programs that provide similar protections to aquatic resources.[8] In some states, PGPs replace some or all of the Corps' nationwide permits, which can result in greater efficiency in the overall permitting process.[9] For example, the Jacksonville District of the Corps—encompassing Florida and Puerto Rico—utilizes its SAJ-71 PGP, which authorizes the deposition of materials for live rock aquaculture within federal waters off the Florida coast.[10] Specifically, SAJ-71 is administered by the National Marine Fisheries Service (NMFS) through an operating agreement with the Corps that gives general authority to NMFS to administer the permit for live rock aquaculture projects sited in navigable waters of the United States within Florida's federal waters. To qualify for this permit, projects must not exceed more than one acre in size and must comply with other requirements such as mandatory site evaluations.

Nationwide Permit 48

Nationwide Permit 48 (NWP 48) permits commercial shellfish aquaculture activities predicted to have minimum individual and cumulative impacts. The permit "authorizes the installation of buoys, floats, racks, trays, nets, lines, tubes, containers, and other structures into navigable waters of the United States."[11] Additionally, NWP 48 authorizes "discharges of dredged or fill

7. *Id.* at 2.
8. *Regional and Programmatic General Permits,* U.S. Army Corps of Engineers.
9. *Id.*
10. *General Permit SAJ-71,* U.S. Army Corps of Engineers, Jacksonville District (Dec. 17, 2015).
11. *Decision Document Nationwide Permit 48,* U.S. Army Corps of Engineers.

materials into waters of the United States necessary for shellfish seeding, rearing, cultivating, transplanting, and harvesting activities."[12] However, NWP 48 does *not* authorize cultivation of nonindigenous species (unless that species has previously been cultivated in the body of water in question), cultivation of aquatic nuisance species, construction of attendant features,[13] the deposition of shell material back into waters of the United States as waste, or activities that directly impact more than one half-acre of submerged aquatic vegetation beds in "new" commercial shellfish aquaculture operations.

NWP 48 draws a clear distinction between "new" and "existing" commercial shellfish aquaculture operations. The 2017 reauthorization altered the definition of new operations to encompass areas where such activities have not occurred during the past one hundred years. This means that if *any* commercial shellfish aquaculture activity occurred at the site within the last one hundred years, the Corps would classify the operation as "existing" rather than "new." New operations, unlike existing operations, must submit pre-construction notification (PCN) to the Corps. In addition, as noted above, new operations do not quality for permitting under NWP 48 if they would directly impact more than one half-acre of submerged aquatic vegetation beds.

Collecting documentation to prove a site hosted an aquaculture operation in the previous hundred years can be quite difficult. Where modern technology makes it fairly easy to determine where aquaculture sites exist currently, it is much harder to locate evidence of property surveys that existed decades past. Such property surveys are necessary for a shellfish farm to take advantage of the hundred-year provision. For example, if an aquaculturist intended to operate in a location that was an oyster bed seventy-five years ago, it is unlikely the documentation required would be readily accessible or of sufficient quality. Instead of conducting a simple Internet search, he would likely have to scour old municipal records, or perhaps attempt to track down the descendants of the previous owner in order to obtain the information he would need to prove the site's previous use. In this way, while NWP 48's definition of "existing" shellfish operations seems to benefit potential growers, it could actually require significant amounts of work to profit from.

12. *Id.*

13. Such as docks, piers, boat ramps, stockpiles, or staging areas. *(Id.)*.

Both new and existing operations must submit PCN under NWP 48 if their activities will include a species that has never been cultivated in the body of water in question. However, since the reissuance, PCN is no longer required for dredge harvesting, tilling, or harrowing activities for existing operations in areas with aquatic vegetation. While this change may seem counterintuitive, the Corps has determined most submerged aquatic vegetation is sufficiently resilient and able to recover from commercial shellfish aquaculture activities.[14] In areas where there are greater concerns regarding adverse impacts, the Corps has called on division engineers to require PCN in their regional conditions to ensure that activities result in no more than minimal individual and cumulative adverse effects.[15]

Following the reissuance of NWP 48 in March 2017, the states conducted Section 401(d) and federal consistency review and made their decisions regarding how to best implement NWP 48 (see below). Some states chose to approve NWP 48 as is, some approved it subject to additional conditions, while others denied approval thereby preventing the implementation of NWP 48 in their state. These differences in implementation across the country can cause confusion among the regulated community as the federal permitting procedures vary among states. Operators in some states may be subject to more burdensome permitting processes than operators in other states, increasing costs and frustrations. The examples below highlight some of the various approaches states have taken across the country.

State Review of Corps Permits

Federal law provides states with the authority to review and place conditions on the issuance of Corps permits. Section 401(d) of the CWA requires that an applicant for a federal license or permit provide a certification from the state that any discharges from the facility will comply with state water quality standards and other applicable state authorities.[16] States may approve, condition, or deny Section 401(d) certification. If issued, the Section 401(d) certification becomes a condition on federal permits, such as Section 404 permits. If certification is denied, the federal agency may not issue the license or permit. States review both individual and general permits under Section 401(d).

14. *Decision Document Nationwide Permit 48*, U.S. Army Corps of Engineers (Dec. 21, 2016).
15. *Id.*
16. Claudia Copeland, *Clean Water Act Section 401: Background and Issues*, Congressional Research Service (June 2, 2015).

Coastal states have additional authority to review federal permitting activities pursuant to the Coastal Zone Management Act (CZMA). Section 307 of the CZMA requires that federal actions (including federally permitted activities) both within and outside the coastal zone that have reasonably foreseeable effects on any coastal use or natural resources of the coastal zone be consistent with the enforceable policies of a state's federally approved coastal management program.[17] This requirement, known as federal consistency, provides states with a strong voice in the federal permitting process. Like with Section 401(d) water quality certification, states may approve, condition, or deny federal consistency. If a state approves a federal permitting activity, it can grant a concurrence, which states the federal activity is consistent with the state's coastal management program. Then, the federal agency is free to issue the permit in question. However, if the state declines to grant such a concurrence, the federal agency is prohibited from issuing any such permit.

For example, Mississippi has declined to grant concurrence pursuant to the CZMA for any NWPs located in several listed categories of waters and requires applicants wishing to conduct aquaculture activities in such waters to first contact it for authorization. In this authorization process, the Mississippi Department of Marine Resources (MDMR) conducts a case-specific CZMA review and may then grant specific concurrence to a proposed activity under any NWP that is consistent to the maximum extent practicable with the enforceable policies of Mississippi's coastal zone management program. If MDMR declines to provide concurrence, an aquaculture project is prohibited from operating in the state, even if that project otherwise qualifies for authorization under a general permit.

Regional and State Implementation

On the federal level, Corps districts can either wholly revoke a NWP or limit the applicability of such by setting regional and state general permit standards. In the New England District of the Corps (encompassing Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont), for example, nationwide permits have been fully suspended and replaced with general permits in each state.[18] Each coastal state in the New England region (meaning every state, save Vermont) has a general permit that supersedes NWP 48. Connecticut's General

17. *Id.*
18. *State General Permits*, U.S. Army Corps of Engineers.

Permit 16 (GP 16) illustrates the type of specific conditions states may impose. GP 16 covers aquaculture projects and fisheries in the state that occur in navigable waters (which might otherwise be authorized under NWP 48). It authorizes the installation of buoys, floats, racks, trays, nets, lines and other structures in these waters for the containment and cultivation of indigenous species of shellfish and seaweed/kelp. GP 16 also authorizes anchored upweller floats, small-scale shellfish hatchery seawater intake/discharge structures, and discharges of dredged or fill material associated with cultivation (such as the bottom placement of cultch or spat-on-shell). The state has delineated PCN requirements and provides for streamlined permitting of certain projects through "self-verification" in much the same way NWPs do. However, GP 16 does not authorize impacts to "Special Aquatic Sites" (including submerged aquatic vegetation) and requires that all facilities be installed and operated in compliance with the state's aquaculture conditions.

State authority over shellfish operations is not limited to Section 404 and Section 10 permitting processes. States have broad authority to enact laws and regulations to protect their natural resources as well as authority to develop leasing programs for shellfish aquaculture. Aquaculture operations may be subject to a variety of state, and even local, laws. Some of these laws may be helpful to aquaculture operations, but others may pose barriers, even if the project otherwise qualifies for a Corps general permit. For example, Connecticut has certain buoy placement guidelines established by the state's Department of Energy & Environmental Protection Boating Division which are meant to protect boaters and prevent accidents.[19] These requirements often necessitate the placement of buoys or markers at aquaculture sites. However, Corps permit conditions may differ from state program marking requirements, such as those issued by a state boating division. So, while an aquaculturist may successfully navigate the Corps' permitting process and prepare to begin operations, the Boating Division could delay the project if it does not conform with the Division's individual buoy placement requirements.

In Virginia, aquaculturists wishing to utilize bottomlands must engage in a single, joint permitting process.[20] The application review process for these permits takes into account various local, state, and federal statutes governing the disturbance or alteration of environmental

19. *General Permit 16 - Standard Aquaculture Terms and Conditions*, Department of the Army/State of Connecticut.
20. *See generally,* Elizabeth Andrews & Angela King, *Guidance Materials on Starting or Expanding an Aquaculture Operation*, *infra* page 58.

resources, and the process is expedited, as applications must be independently, yet concurrently, reviewed by local wetland boards, the Virginia Marine Resources Commission, the Virginia Department of Environmental Quality, and the Corps.

An applicant in the New England District must submit their general permit application, including their project plans, to the Corps regulatory office either directly or through the appropriate state regulatory agency as required by the applicable general permit.[21] The Corps then reviews the application and conducts the required review with federal resource agencies and the state environmental permitting authority. The Corps will only issue general permit authorization if they, the federal resource agencies, and the state all agree the proposal will have a minimal environmental impact. The authorization may also carry special conditions meant to insure minimal impacts. The Corps, either alone or in consultation with federal agencies, has the power to determine whether an individual permit review will be required.

Legal Challenges

When NWP 48 was renewed in 2017, the Seattle District of the Corps implemented only one regional condition—that the commercial harvest of clams by means of hydraulic escalator would not be authorized under the permit. This move angered many environmentalists, who believed the lack of additional stipulations would open the floodgates to rapidly expanding commercial aquaculture operations in the state.[22] One nonprofit organization in particular, the Center for Food Safety (CFS), filed a complaint against the Corps in federal court.

In its lawsuit, CFS argues that NWP 48's revised definition of "new commercial shellfish aquaculture operation" would allow shellfish aquaculture acreage in Washington State to double to an estimated 72,300 acres—constituting one third of the state's shorelines. CFS believes this expansion could have serious environmental impacts, including increased pesticide and plastic use, as well as reduction and removal of eelgrass and other submerged aquatic vegetation—negatively impacting aquatic vegetation, forage fish, and other species. Additionally, CFS asserts that the Corps did not fully consider the environmental impacts of NWP 48 in violation of the CWA, the National Environmental Policy Act (NEPA), and the

21. *Guide for Permit Applicants*, U.S. Army Corps of Engineers.
22. However, it is important to recognize that many states, including Washington, have additional regulatory frameworks in place to help prevent outcomes such as this.

Administrative Procedure Act. CFS argues that the Seattle District should have imposed additional regional conditions to mitigate environmental harm as well as produced an environmental impact statement.

CFS's ultimate goal is for the court to vacate the Seattle District's decision regarding NWP 48. Depending on what the court decides in this case, the implications for Washington's commercial aquaculture could be profound. If the court dismisses the plaintiff's claims, commercial aquaculture operations in Washington State could be given the opportunity to expand greatly and expeditiously under 2017 NWP 48's permitting process. However, if the court grants CFS's requested relief, shellfish aquaculture operations in Washington State could be faced with stricter permitting requirements in the future. Regardless of the outcome, this case exemplifies yet one more challenge that aquaculturist applicants face, despite the favorable language of NWP 48.

Following the filing of CFS's complaint, the Swinomish Indian Tribal Community soon followed suit and filed against the Corps as a whole, the Seattle District of the Corps, and NMFS in April 2018. The Swinomish Tribe's lawsuit takes issue with NWP 48's inadequate protection of eelgrass, inadequacy the Seattle District allegedly failed to mitigate by imposing regional conditions. Specifically, the Swinomish Tribe recognizes NWP 48's measures requiring avoidance of eelgrass beds in new operations that have never been cultivated yet contests the inapplicability of the avoidance requirement to eelgrass beds in "continuing fallow areas"—areas that previously hosted shellfish operations at some time but have not since 2007 when the first version of NWP 48 was issued. The Tribe notes that in North Puget Sound, thousands of acres of continuing fallow areas host mature eelgrass beds, making the non-applicability of NWP 48's mandatory avoidance measures egregious. The Tribe alleges this omission violates portions of the CWA, NEPA, and the ESA. Accordingly, the Tribe seeks to have the court vacate and set aside NWP 48 as applied to native eelgrass beds in North Puget Sound, along with the associated NEPA assessments and ESA determinations. The outcome of this case could also create significant challenges for aquaculture stakeholders in successfully permitting and operating shellfish farms. Accordingly, Taylor Shellfish Co., a shellfish aquaculture company operating in Washington, was allowed to intervene in the case in February 2019.

Conclusion

On its face, NWP 48 provides a streamlined federal permitting process for commercial shellfish operations. Aquaculture stakeholders must remain cognizant of the variations in applicability of NWP 48 across the country. Permitting processes vary from region-to-region and state-to-state. Even if applicants are successfully granted a shellfish aquaculture permit by the Corps, other agencies in a state can prevent them from actually making use of that permit due to additional requirements. Aquaculturists must remain aware of these potential challenges when they initiate the permitting process. While nationwide permits can make the process easier in many locales, NWP 48 is not always the final answer. With this knowledge, and adequate attention to detail, commercial shellfish aquaculture permittees will be able to more successfully navigate down the regulatory path toward commencing operation of their site.

Overcoming Impediments to Shellfish Aquaculture: Access to Public Boat Launches

This study was produced by the Rhode Island Sea Grant Law Fellow Program under the guidance of Read Porter, Senior Staff Attorney, and with research and drafting by Mitchell Ramic, Law Fellow.

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Photo: Rhode Island Sea Grant

Access to public boat launches can be important to the success of shellfish growers in Rhode Island. Many public boat launches are constructed using federal funding for the primary purpose of supporting recreational use for the general public. To protect public launches for recreational uses, some states limit or prohibit their use for commercial purposes. In the absence of accessible private alternatives, growers in these states may face increased costs and other difficulties in accessing their leases on a daily basis. Imposition of similar restrictions in Rhode Island would pose a challenge to state growers.

This case study considers how state and federal law affect shellfish grower access to public boat launches and the implications for Rhode Island growers and agencies. Part I covers how shellfish growers in Rhode Island and nearby states rely on public boat ramps for access to leases. Part II provides an overview of how federal law limits the use of federally-funded public boat launches. Part III reviews how state laws and regulations address access to public boat launches. Part IV presents options for states, including Rhode Island, to consider when developing approaches to commercial use of public boat launches.

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I. Use of Public Boat Launches for Shellfish Aquaculture

Rhode Island aquaculture production has expanded rapidly in recent years and now produces approximately $5.7 million worth of shellfish—mostly oysters—from 73 farms on about 300 acres of coastal waters.[1] Most Rhode Island shellfish farms are located on small leases that are located in shallow subtidal areas of coastal salt ponds and Narragansett Bay.[2]

Access to boat launches is emerging as an important issue for the Rhode Island aquaculture industry. Growers must use boats to reach and work on most leases, making marina or boat launch access a critical part of their day-to-day business. Growers need this access not only to launch their vessels and rafts to access leases, but also to load and unload gear and shellfish product.[3]

Public boat launches serve an important role for growers in Rhode Island, where working waterfront sites in Rhode Island are limited.[4] Access to public boat launches can be contested, particularly during the summer boating season when they are heavily used.[5] The industry has also expressed a concern that the state may prevent growers from using public boat launches facilities funded by recreational fishing programs.[6] Where these launches represent the only effective means of accessing a site, such an action could effectively bar growers from accessing their leases. In other instances, growers would need to identify alternative launch sites, which could increase costs or pose other logistical challenges.

Industry concerns have been fueled by legal restrictions on grower use of public boat launches in other states. For example, a shellfish grower was warned by state enforcement personnel for using a public boat launch in Westport, Connecticut as a staging area for gear and

1. Coastal Res. Mgmt. Council, Aquaculture in Rhode Island 2017 3 (2016).
2. *See* RIDEM, Approved Aquaculture Leases in Rhode Island (Interactive Map) (2017).
3. Telephone interview with Tessa Getchis, Aquaculture Extension Agent, CT Sea Grant (Sep. 29, 2017).
4. Rhode Island has identified preservation and expansion of the state's working waterfront access, including boat ramps, as part of its Shellfish Management Plan. Rhode Island Shellfish Management Plan ver. II (2014) ("Affordable dockage and access for the shellfish industry is becoming limited, particularly as the industry is expanding. Parking at some boat ramps and public access points is an issue that should be addressed.").
5. Cassius Shuman, *Aquaculture Farmers Seek Better Process*, Block Island Times, Oct. 14, 2017, ("'There are too many multi-users at the boat ramp' behind BIMI, said oyster farmer Dave Deffley. 'I think it's a multi-faceted issue. Things get clogged there. It's a safety issue. That's where we offload. If you improved that one area it would be beneficial.'").
6. Email from Robert Rheault, Executive Director, East Coast Shellfish Growers Ass'n to Read Porter, Senior Staff Attorney, Marine Affairs Institute (Sept. 10, 2017).

loading/unloading product.[7] The launch is the only such facility in the state east of New Haven, and therefore sees a high level of recreational use during boating season.[8] As discussed below, Connecticut prohibits commercial use of public launches, with very limited exceptions, to protect access for these users. As a result, this grower, and other similarly situated growers, may need to determine an alternate access point to continue their business operations. Imposition of similar legal restrictions on access to public boat launches in Rhode Island could result in an important new impediment to the state shellfish aquaculture industry.

II. The Federal Role in Public Boat Launches

The federal government plays an important role in the construction and maintenance of public boat launches by states. The Federal Aid in Sport Fish Restoration Act,[9] also known as the Dingell-Johnson Act and Wallop-Breaux Act, levies fees on recreational fishing equipment, which are passed through to states to support recreational fishing and boating activities. Funding for projects under the Act comes from taxes and duties on sport fishing equipment, vessels, and boat gas, which are placed into the Sport Fish Restoration and Boating Trust Fund.[10] The U.S. Fish and Wildlife Service (USFWS) apportions the revenues among categories of approved projects and among states.[11] States use these apportioned funds as up to 75 percent of the total cost of approved projects.[12]

Construction and maintenance of public boat launches may qualify for funding under two subprograms.[13] States can use funds from the Sport Fish Restoration subprogram to acquire land and construct structures for public access for sport fishing, as well as to maintain and operate previously-funded facilities.[14] Similarly, USFWS authorizes use of the Recreational Boating Access subprogram to "[a]cquire land for new facilities, build new facilities, or acquire, renovate, or improve existing facilities to create or improve public access to the waters of the United States or improve the suitability of these waters for recreational boating."[15]

7. Interview with Tessa Getchis, *supra* note 3.
8. *Id.*
9. 16 U.S.C. § 777; 50 C.F.R. § 80.51.
10. 26 U.S.C. §§ 9504 (establishing Trust Fund); 16 U.S.C. § 777b (authorizing appropriations from Trust Fund).
11. 16 U.S.C. § 777c.
12. *Id.* § 777e (federal approval of projects).
13. 50 C.F.R. § 80.51.
14. *Id.* § 80.51(a).
15. *Id.* § 80.51(b)(1).

The Act requires states to spend at least 15 percent of their appropriated funds each year on recreational boating access projects.[16]

Projects funded under the Act are subject to certain conditions, including for commercial use of federally-funded projects. In particular, states may allow commercial activities at federally-funded facilities, subject to certain conditions.[17] Specifically, "[a] State agency may allow commercial, recreational, and other secondary uses of a grant-funded parcel of land or water or capital improvement if these secondary uses do not interfere with the authorized purpose of the grant."[18] The state has "first responsibility" to determine if commercial activity interferes with its intended purpose, but USFWS will consult with states and retains the right to review and inspect facilities to determine if commercial use is interfering with recreational purposes.[19]

States have broad latitude to manage the use of boat launches to protect recreational use. The city of Lakeland, Florida has an ordinance that "prohibits the operation of any airboat upon any of the lakes within the city."[20] This ordinance was challenged unsuccessfully by the Kissimmee River Valley Sportsman Association.[21] In dismissing the challenge, the Eleventh Circuit Court of Appeals held that the Act "does not create a federal right to equal access for boats of common horsepower ratings at federally funded boat launch facilities."[22] Thus, it was permissible for Lakeland to distinguish between types of recreational boats. If a state or city can create preferences among recreational vessels, then it could surely also distinguish between permissible commercial activities. Thus, states appear legally authorized to deny the use of public boat launches to commercial users, including shellfish growers.

The Sport Fish Restoration Program provides state fish and wildlife agencies with needed capital to improve public access—including construction and maintenance of public boat launches. However, states accepting these funds must ensure that the resulting projects are available to recreational users. Thus, while states can allow commercial use of these facilities, including by shellfish growers, these commercial uses cannot unduly interfere with recreational

16. 16 U.S.C. § 777g(b).
17. 50 C.F.R. § 80.134.
18. *Id.*
19. USFWS Service Manual, 522 FW §§ 22.6, 22.7.
20. Lakeland, Fla. Code of Ordinances § 58-32.
21. Kissimmee River Valley Sportsman Ass'n v. City of Lakeland, 250 F.3d 1324, 1325 (11th Cir. 2001).
22. *Id.* at 1327.

use—a particular issue where public access points are few in number compared to the demand for such facilities. The next section explores the approaches that coastal states have undertaken to manage commercial use at public facilities.

III. State Limitations on Public Boat Ramps for Commercial Fishers

This section describes state regulation governing the use of public boat launches by shellfish growers in coastal states. In general, states do not specifically regulate this sector, but instead regulate all commercial uses or, in limited instances, specific uses that pose particular challenges. This analysis assumes that a regulation of commercial use applies to shellfish aquaculture use, including launching vessels to access leases and loading or unloading gear or product. States also use different terms to describe boat launches, including public access point, public boat ramp, public boat launch and public access facility. This section adopts the language used in each state.

A. Alabama

In Alabama, commercial activity is prohibited at a public access area. Specifically, "[p]ublic access areas are for the use of pleasure boating, hunting and fishing. No commercial, industrial or construction equipment such as barges, dredges, etc., are to be loaded or unloaded without the specific written authorization of the Commissioner of Conservation and Natural Resources."[23] In this regulation, public access is defined as "any state-owned, leased, and/or operated boat launching and/or landing access area, parking lot, ramp, [or] pier" and surrounding areas.[24]

B. Alaska

Under Alaska regulations, it is unlawful for any boat owner or user to "conduct or operate any commercially oriented business enterprise at [a state harbor] facility unless specifically authorized in writing by the commissioner."[25] State harbor facility is broadly defined to include "any float, grid, dock, launching ramp . . . and appurtenances constructed or operated by the State of Alaska."[26] The intent of the prohibition on

23. Ala. Admin. Code r. 220-2-.37 (2017).
24. *Id.*
25. Alaska Admin. Code tit. 17, § 80.090(4) (2017).
26. *Id.* § 80.110(4).

commercial use of these facilities is to "discourage and prevent the use of state harbor facilities by individuals or firms for the purpose of conducting commercial enterprises."[27] However, this rule is also intended to "encourage the use of state harbor facilities by commercial fishermen."[28] This apparent contradiction is not explained, but suggests that launching of commercial vessels may not be unlawful, whereas other activities, such as loading and unloading gear or landing product, may be prohibited.

Alaska state parks may require the payment of a fee (up to $20 per day or $150 per year) for the use of an improved boat ramp in a state park facility.[29]

C. California

California boat launching regulations do not explicitly regulate commercial activity at public boat launches.[30]

D. Connecticut

Connecticut Department of Energy and Environmental Protection (DEEP) regulations provide that "no person shall engage in any commercial activity at [a boating access area] unless so authorized by the Department of Environmental Protection."[31] "Boating access area" is not defined, but the prohibition applies to such areas that are under DEEP jurisdiction and which are "intended to provide public access."[32]

E. Delaware

Delaware has established a regulation governing the use of public boat ramps and mooring facilities.[33] The regulation is silent on and does not prohibit commercial use of these facilities.[34]

27. *Id.* § 80.020.
28. *Id.*
29. Alaska Admin. Code tit. 11, § 05.010(a)(12)(F)(ii) (2017).
30. *See* Cal. Code Regs. tit. 14, § 4657 (launching areas regulation).
31. Conn. Agencies Regs. § 26-16-1.
32. *Id.*
33. 7-3000-3100 Del. Admin. Code § 10.2 (2017).
34. *Id.*

F. Florida

The Fish and Wildlife Conservation Commission (FWC) is responsible for implementation of Sport Fish Restoration projects in Florida, including boating access.[35] However, FWC has not issued general regulations governing public boat ramps or similar facilities. As a result, commercial activity is not prohibited at such facilities. Commercial activity may be subject to different or specific regulation in particular locations, however. For example, "[c]ommercial activity by a person or entity" is prohibited on lands under the jurisdiction of the South Florida Water Management District "without a written agreement with the District."[36] Other local restrictions may also apply.

G. Georgia

Georgia has not issued any law or regulation governing the commercial use of public boat launches.

H. Hawaii

The state of Hawaii has established a policy that no "regular or extensive use of any state property or facilities for private gain or purposes shall be permitted without corresponding and reasonable benefits and returns to the public."[37] Hawaii therefore prohibits the commercial use of small boat harbors and facilities, except with prior written approval from the state Department of Land and Natural Resources (DLNR) or an executed agreement with the DLNR.[38]

Department authorization is in the form of several categories of use permits, including a commercial use permit, which "authorizes the owner of a commercial vessel to engage in commercial activities as specified in the permit."[39] The regulations define "commercial vessel" as "a vessel engaged in any trade or business."[40] While commercial fishing vessels are commercial vessels under this definition, they are exempt from certain permitting requirements "if the total income derived from the use of the vessel is generated through the sale of fish or permitted coral."[41]

35. *See* FWC, Boat Ramps and Access.
36. Fla. Admin. Code Ann. r. 40E-7.537(10) (2017).
37. Haw. Code R. § 13-231-50 (2017).
38. *Id.* § 13-231-51; *see also* Department of Land and Natural Resources, *Frequently Asked Questions* (Aug. 31, 2013).
39. Haw. Code R. § 13-231-3.
40. *Id.* § 13-231-54.
41. *Id.* § 13-231-55.

Issuance of commercial use permits for the use of state boat launching ramps is restricted because the ramps "were constructed for the primary purpose of providing access to the waters of the State for trailered boats."[42] Therefore, the state restricts commercial permits for these facilities to "boats that are regularly launched and recovered from boat launching ramps and used in the course of doing business."[43] Fees for the use of these facilities are the greater of $75 per month or two percent of gross revenues.[44]

I. Louisiana

The Louisiana Wildlife and Fisheries Commission has not promulgated any regulations on the use of public boat launches. However, commercial boats are prohibited from using any Office of State Park facilities without the written consent of the assistant secretary.[45] Commercial boats are defined to include "any watercraft from which commercial activities are conducted, e.g., shrimping, crabbing, fishing, etc."[46] Prohibited uses specifically include, but are not limited to, "loading or unloading of materials, boarding of persons, operating power equipment and non-emergency repair work."[47]

J. Maine

The Maine Bureau of Parks and Lands, Boating Division regulates the use of state boating facilities.[48] The regulations apply "to any person using State boat launching facilities or waters immediately surrounding the facilities."[49] Under the regulations, "uses of the launching facility and parking areas, including, but not limited to, commercial use . . . are allowed only by special activity permit from the Bureau Director."[50] Department regulations do not contain provisions governing the conditions for issuance of such permits.

K. Maryland

Maryland has not issued regulations governing the use of state boat launches or restricting their use for commercial purposes. However, restrictions may apply at

42. *Id.* § 13-231-67.
43. *Id.*
44. *Id.* § 13-234-31. *See* Louisiana State Parks, *Find Parks and Historic Sites: Play* (showing state park boat launch locations).
45. La. Admin. Code tit. 25, Pt. IX, § 307(H) (2017).
46. *Id.*
47. *Id.*
48. 01-670-004 Me. Code R. § 1 (2017).
49. *Id.*
50. *Id.* § 2(J).

facilities under local jurisdiction. For example, the Caroline County Code of Laws requires any person wishing to use "Public Landing" to first obtain a Public Landing Permit from the County Department of Recreation and Parks.[51] The applicable regulation states "[i]t shall be a violation of this Article for any person to launch or remove any vessel from the water of a Public Landing."[52] Public Landings are defined as "public landings, public wharves, public docks, public piers, public marinas, and public harbors," as well as adjacent lands and rights-of-way, under the County's jurisdiction.[53]

L. Massachusetts

Massachusetts limits commercial use of public boating access facilities. "Unless otherwise authorized by special or general permit . . . , it is unlawful for any person to . . . conduct any business, commercial or trade activity that is inconsistent with the intended use of the facility."[54] A public access facility means "any public facility that . . . provide[s] access by the public to a land and/or water resource within Massachusetts" that is subject to the jurisdiction of the state Public Access Board.[55] Public access facilities explicitly include "boat launching ramps."[56]

Aquaculture use may or may not be consistent with the intended use of a boat launch. The regulations define "Intended Use of a Public Boating Access Facility" to mean "the launching and retrieval of any trailered or cartop watercraft and parking of the vehicle used to launch and retrieve watercraft in a properly marked parking area."[57] Launching of vessels for service of aquaculture sites appears consistent with this definition, but the legality of using these facilities for loading and unloading of gear and product appears uncertain without a permit. The regulations do not appear to authorize issuance of permits for regular commercial use, as special permits authorize activities lasting no more than seven days, while general permits are available only to governmental authorities for public purposes.[58]

51. Caroline Cy., Md. Code of Public Local Laws, Ord. No. 96-002, § 148-12 (2017).
52. *Id.* § 148-12.
53. *Id.* § 148-3.
54. 320 Mass. Code Regs. 2.04 (2017).
55. 320 Mass. Code Regs. 2.01 (2017) (citing Mass. Gen. Laws ch. 21A, § 11B (establishing Board)).
56. *Id.*
57. *Id.*
58. *Id.* § 2.03.

M. Mississippi

Mississippi has not issued any laws or regulations prohibiting commercial use of public boat launches.

N. New Hampshire

New Hampshire prohibits the use of public boat access facilities for commercial activity.[59] Under this regulation, "[n]o person shall conduct a commercial or business activity at a boat access facility."[60] Boat access facility means "all of the property owned or controlled by the fish and game department which provides public access to public waters."[61]

O. New Jersey

New Jersey has not issued a rule prohibiting commercial fishermen or shellfish growers from using public boat launches. The New Jersey Boat Ramp Guide notes that growers "seldom interfere with recreational boating or angling activities because the scale of the operations is small in relation to the total bay acreage, leases are clustered and located in shallow water areas away from navigation channels, and aquaculture gear profile is low."[62] This passage suggests that the state has determined that grower use of boat ramps is unlikely to interfere with the recreational use of those facilities.

P. New York

New York has a regulation prohibiting commercial activity at "all boat-launching sites [and] fishing-access sites" under "the jurisdiction of the Division of Fish and Wildlife of the Department of Environmental Conservation."[63] Specifically, the regulation states: "[n]o person shall conduct any business, buy, sell, offer or expose for sale, hire, lease or vend any article or merchandise of any kind [at these facilities] unless a written permit is first obtained from the department."[64] A written permit is also needed to use these sites "for any purpose other than the launching and retrieval of boats . . . ."[65] The permitting process is not defined.

59. N.H. Code Admin. R. Fis 1602.01(m) (2017).
60. *Id.*
61. N.H. Code Admin. R. Fis 1601.01 (2017).
62. New Jersey Marine Sciences Consortium (NJMSC), New Jersey Boat Ramp Guide 11.
63. N.H. Code Admin. R. & Regs. tit. 6, § 59.1(c) (2017).
64. *Id.*
65. *Id.*

Q. North Carolina

North Carolina has not issued a rule or regulation prohibiting shellfish growers from using public boat launches. North Carolina defines and regulates the use of "public fishing and boating access area," which includes any sites under the jurisdiction of the North Carolina Wildlife Resources Commission.[66] The regulations do not prohibit commercial activity. However, they do restrict allowable activities to launching boats: "it is unlawful to use any boating access area for purposes other than the launching of boats and parking vehicles and boat trailers."[67] This provision may restrict loading and unloading of gear and product where unrelated to the launching of a vessel.

R. Oregon

Oregon has issued regulations governing disbursement of funding for creation and maintenance of "public boating facilities."[68] However, neither these regulations nor other state laws or regulations prohibit commercial use of these facilities.

S. Pennsylvania

The Pennsylvania Fish and Boat Commission has promulgated a regulation regulating activities at Commission-controlled access areas and marinas.[69] This regulation is silent on commercial use of these areas.[70] However, additional Commission regulations govern commercial use of any Commission property. Under this regulation, "it is unlawful to use Commission-owned or -controlled property for . . . commercial purposes other than the intended use of the property."[71] Limited commercial use consistent with intended uses is allowed, provided that it "does not interfere with free public use of the access" and complies with specific conditions.[72] These conditions primarily apply to "commercial enterprises"—defined as boat rental companies—and include parking restrictions and yielding to recreational users.[73]

66. 15A N.C. Admin. Code 10E.0101 (2017).
67. 15A N.C. Admin. Code 10E.0104(e) (2017).
68. Or. Admin. R. 250-014-0001 – 250-014-0005 (2018).
69. 58 Pa. Code § 53.12a.
70. *Id.*
71. 58 Pa. Code § 53.16.
72. *Id.*
73. *Id.*

T. Rhode Island

Rhode Island has not issued a law or regulation prohibiting commercial use of public boat launches.

U. South Carolina

South Carolina has issued extensive regulations governing the use of lands under the jurisdiction of the state Department of Natural Resources, but these regulations do not prohibit the commercial use of public boat launches.[74]

V. Texas

Texas has not issued a law or regulation prohibiting commercial use of public boat launches.

W. Vermont

Vermont statutes authorize the state to acquire and regulate lands for hunting and fishing, including access areas and landing areas.[75] The Vermont Fish and Wildlife Board has issued regulations implementing this authority by governing "the use by the public of access areas, landing areas," and other areas,[76] as well as separate regulations governing the use of "fishing access areas."[77]

On access areas other than fishing access areas, "Commercial Activities" are prohibited unless specifically allowed.[78] "Boating, including launching and landing, for fish-based and wildlife-based activities" is a specifically-authorized commercial activity, and may apply to shellfish aquaculture.[79] In the alternative, the Commissioner of the Vermont Fish and Wildlife Department may grant a "Special Use Permit, Lease, or License" for any prohibited activity, "so long as the Commissioner has determined that there will be no adverse impact on Authorized Activities or other adverse impacts on the primary purposes of ownership."[80]

74. *See* S.C. CODE ANN. REGS. 123-200 – 123-211.
75. VT. STAT. ANN. tit. 10, §§ 4144-4145.
76. 16-4-105 VT. ADMIN. CODE § 1.1 (2017).
77. 16-4-149 VT. ADMIN. CODE § 1.1 *et seq* (2017).
78. 16-4-105 VT. ADMIN. CODE § 5.1(f). Commercial Activity is defined as "any activity or service that produces income for any person, group, business or entity, including any activity or service by any non-profit entity where a fee is required or requested." *Id.* § 3.12.
79. *Id.* § 4.1(c).
80. *Id.* § 6.1.

"Commercial activity" is also prohibited at fishing access areas unless authorized.[81] Commercial activity in these areas is broadly defined as "any activity or service that produces income to any entity or individual."[82] Limited commercial activity is authorized, including "the launching of any vessel to be used for fishing and parking of vehicles and trailers necessary for and contemporaneous with these purposes" and the launching of inboard and outboard motorboats for other activities.[83] The Commissioner may also issue special permits for group uses upon a determination that these uses will not adversely affect priority uses.[84]

X. Virginia

Virginia has not established laws or regulations specifically governing the use of public boat launches for commercial use. However, two state departments have relevant statutory and regulatory responsibilities.

The Department of Conservation and Recreation (DCR) has adopted regulations establishing fees for the use of DCR facilities, including fees for boat launches and for associated parking.[85] In addition to these generally applicable fees, it separately regulates certain commercial uses of DCR facilities located in state parks.[86] This regulation does not appear to apply to shellfish growers because they do not deliver services to the public for a fee; moreover, it specifically excludes licensed commercial fishermen, who are instead "required to pay the applicable public user fee for the use of state park boat launches."[87] This commercial use provision thus recognizes that DCR facilities are open to commercial use upon payment of the required fee.

The Department of Game and Inland Fisheries (DGIF) is empowered to acquire "lands and structures for use as public landings, wharves, or docks" and to regulate the use of such facilities by regulation.[88] State law and DGIF regulations prescribe use and parking

81. 16-4-149 Vt. Admin. Code § 5.15 (2017).
82. *Id.* § 3.1.
83. *Id.* § 7.1 (citing *id.* §§ 4.1-4.3).
84. *Id.* § 8.1.
85. 4 Va. Admin. Code § 5-36-50 (2017) (applying to "businesses that use the lands and/or facilities of a state park to deliver services to the public for a fee, and when such use is similar or the same as the general public use").
86. 4 Va. Admin. Code § 5-36-80 (2017).
87. *Id.*
88. Va. Code § 29.1-103(5).

fees for state facilities, but specifically waive fees for the use of "department-owned boat ramps."[89] However, special uses of boat ramps require a permit, available for Private/Commercial Use from DGIF for $50.[90]

Finally, the Marine Resources Commission (MRC) governs shellfish landings for public health purposes. Its regulations prescribe specific loading and unloading locations for particular shellfishing activities, including harvest from condemned areas and during shellfish relays.[91]

Y. Washington

Washington prohibits the "use [of] department lands for any commercial purposes without a permit from the director" of the Department of Fish and Wildlife.[92] "Commercial use or activity" includes uses "[w]here the primary purpose is the sale or barter of a good or service."[93] "Department land" includes all water and access areas "under the ownership, management, lease, or control of the department, excluding private lands."[94] Under these definitions, department-controlled boat launches are considered department land, and aquaculture is considered commercial use. As a result, growers need a permit to use state boat launches. The regulations do not indicate the requirements to obtain a permit.

IV. Analysis

Coastal states have adopted a variety of legal mechanisms governing the use of public boat launches for commercial purposes in compliance with federal law. The Federal Aid in Sport Fish Restoration Act allows states to regulate the use of public facilities constructed or maintained with funds from the Sport Fish Restoration Trust Fund.[95] States can allow commercial activity at these facilities as long as that activity does not undermine the purpose of the grant funding.[96]

89. *Id.* § 29.1-113; 4 VA. ADMIN. CODE § 15-20-66.
90. 4 VA. ADMIN. CODE § 15-20-200.
91. 4 VA. ADMIN. CODE §§ 20-980-20 (listing of locations for loading and unloading from condemned locations); 20-1200-20 (loading and unloading location for oysters during the Rapahannock River oyster relay season).
92. Wash. ADMIN. CODE § 220-500-060 (2017).
93. *Id.* § 220-500-020(6)(b) (2017).
94. *Id.* § 220-500-020(9).
95. 50 C.F.R. § 80.134.
96. *Id.*

States use three methods to regulate public boat launches in compliance with this federal mandate: authorization; silence; and prohibition. A few states have authorized commercial use in all or a subset of conditions, either explicitly or implicitly. Other states prohibit all commercial activity or allow such use only under tightly-constrained circumstances. However, silence is the most common approach—and the approach currently used by Rhode Island. In these states, no regulation speaks to commercial use of public boat launches, and commercial use is allowed by default. The states adopting each approach are listed in the table below.

Explicit or Implicit Authorization	Silence	Prohibition / Special Permit
Alaska*	California	Alabama
Hawaii	Delaware	Connecticut
Pennsylvania	Florida	Louisiana
Vermont	Georgia	Maine
Virginia*	Maryland	Massachusetts
	Mississippi	New Hampshire
	New Jersey	New York
	North Carolina	Washington
	Oregon	
	Rhode Island	
	South Carolina	
	Texas	

* commercial fishing use explicitly authorized

Five states considered in this study have adopted regulations that implicitly or explicitly authorize commercial use of public boat launches. These states can be further divided. In Pennsylvania and Vermont, this authorization is conditional and requires deference to recreational users. Hawaii's authorization is explicit and subject to conditions established in a permit system. Alaska and Virginia indicate that licensed commercial fishermen can use state boating access facilities in common with public users. If shellfish growers are included in this category, this last form of authorization would be the broadest potential authorization for them to use state boat launches. Fees may be required for use of boat launches, and these fees may be enhanced for commercial users in comparison to public users. For example, Virginia has a special use permit for commercial activity at certain state-owned boat ramps. The fees associated with these approvals may help manage demand for commercial use of limited resources while also supporting maintenance of the boat launches for their statutorily-protected recreational use.

Most states have not regulated commercial access to state boat launches. This silent approach leaves in place the default assumption that these facilities are open to all users. This regulatory silence implies that conflicts have not arisen enough to push the state to take direct action on this issue. In these states, commercial activity is likely to be tolerated as long as it does not interfere with the recreational use of the public boat launch. However, this tolerance may be tested if and when conflicts over boat launch access arise. Thus, shellfish growers may prefer explicit consideration and authorization to remove uncertainty over access rights, even if they must pay a fee or face conditions.

A variety of states have acted to prohibit commercial use of public boat launches, often with limited exceptions that may be unavailable to shellfish growers. Prohibitions on commercial use of public boat launches represent a clear method of ensuring the primacy of recreational use of public boat launches funded through the Sport Fish Restoration Trust Fund. Many of these regulations appear to have been drafted to primarily address on-site commercial uses like concessions. However, shellfish growers also appear to be subject to these restrictions because launching vessels and loading and unloading gear and product are conducted for a business purpose. For the same reason, it is unlikely that growers can avoid prohibitions by engaging in recreational activities in conjunction with commercial activity—a little recreational fishing will not alter the fact that the activity's primary purpose is commercial.

States with commercial prohibitions often recognize that some commercial use may be important and have created limited exceptions to blanket prohibitions on commercial use. These exceptions may take the form of a Special Permit or other written authorization from the director of the responsible agency. For example, Connecticut regulations allow the Department of Energy and Environmental Protection to authorize commercial use of launches, but do not detail the process to obtain authorization or under what conditions it may be granted.[97] In practice, this exception has enabled the state Department of Transportation contractors to use boat launches as part of bridge repair work,[98] and the Department may not consider ongoing private business use of a boat launch to be appropriate for authorization. This may suggest that exceptions that are legally available to shellfish growers may in practice present insurmountable barriers to shellfish growers.

97. Conn. Agencies Regs. § 26-16-1.

98. Interview with Tessa Getchis, *supra* note 3.

V. Conclusion

The purpose of this case study is to inform choices about the use of state boat launches by shellfish growers. It considered state approaches to regulating the use of public boat launches for commercial use to establish the range of regulatory approaches currently in use. This case study identified three primary approaches to the commercial use of public boat launches that are available to Rhode Island: (i) implicit or explicit authorization; (ii) silence; and (iii) prohibition for commercial use, with limited exceptions. By considering these options to carefully tailor a regulatory approach, Rhode Island may effectively ensure that aquaculture use of public facilities does not interfere with recreational use, while also continuing to support the expansion of Rhode Island's growing aquaculture industry.

Legal Influences on Shellfish Aquaculture Nursery Facility Siting in Rhode Island

This study was produced by the Rhode Island Sea Grant Law Fellow Program. Research and drafting was provided by Law Fellows Jordan Viana and Joseph Bingaman under the guidance of Read Porter, Senior Staff Attorney.

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Rhode Island aquaculture employment and revenue have grown at an exponential rate over the past decade.[1] Nursery facilities are a critical component of shellfish production and play an important role in the success of the shellfish aquaculture industry. Limitations on appropriate nursery sites therefore could become an important constraint on the industry in the future. This case study examines the governance of shellfish nursery facility siting in Rhode Island to identify whether and how legal systems support or create impediments to nursery siting or enable siting in creative ways.

Part 1 describes nursery systems. Part 2 considers relevant Rhode Island law governing nursery system siting. Part 3 examines local authority over nursery system siting. Part 4 identifies key nursery system siting opportunities and challenges and analyzes how Rhode Island law enables or hinders them. Part 5 concludes with thoughts for the application of this case study in other jurisdictions.

1. Coastal Resources Mgmt. Council, Aquaculture in Rhode Island (2017).

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1 Shellfish Aquaculture Nurseries

Nursery systems support a crucial step in the shellfish aquaculture cycle. After obtaining juvenile shellfish seed from a hatchery, growers place their new crop in a nursery to grow to approximately an inch in size.[2] When the shellfish are large enough they are placed in a lease area for grow-out, where they remain until ready for market.[3]

Nursery systems come in a variety of forms, including simple "rack and bag" systems, floating upwellers, and land-based upwellers or raceways.[4] Floating upweller systems, commonly known as "FLUPSYs," are a common choice, but other floating systems, such as "Taylor Floats," may also be used.[5] Upweller systems pump seawater into the bottom of a container of juvenile shellfish.[6] The juvenile shellfish feed on the nutrient-rich water, which flows out the top of the container before returning to the environment.[7] Upweller nursery systems can be found on land or in the water.[8] This study focuses primarily on FLUPSYs, which are used to grow oysters—the most prevalent species under cultivation in Rhode Island.[9]

Nursery upwellers must be sited appropriately to grow shellfish. Juvenile shellfish require a strong flow of seawater containing food and oxygen. Growers must consider salinity, temperature, phytoplankton, and water quality when selecting a nursery site.[10] In addition, areas susceptible to harmful phytoplankton blooms or diseases may not be appropriate for nursery facilities.[11] Nursery upwellers provide flowing water with electric pumps[12]—requiring that they be connected to a source of power, such as cables to shore or solar panels. Alternatively, in areas with strong tides, water can be pushed through the system naturally.[13]

2. Northeastern Regional Aquaculture Center, Shellfish Aquaculture Feasibility Study Part II: The Feasibility of New, Small-scale Oyster Culture Businesses at 6.
3. *Id.*
4. Dale Leavitt, Shellfish Upweller Nurseries (illustrating upweller designs).
5. Gef Flimlin et. al., Best Management Practices for the East Coast Shellfish Aquaculture Industry 10. Taylor floats are constructed from watertight PVC pipe connected in a rectangle, with netting in the center to hold the seed. *Id.*
6. *Id.* at 9.
7. *Id.*
8. *Leavitt, supra* note 4.
9. CRMC, *supra* note 1.
10. *Id.* at 19.
11. *Id.*
12. *Id.* at 32-33.
13. *Id.*

Shellfish growers also must consider their own needs when siting nursery facilities. Access to fresh water (and electricity for a powerwasher) is beneficial to clean the juvenile seed, silos, and other equipment, but may create noise impacts.[14] Growers also need consistent access to nursery sites by boat or by land to monitor the safety and health of their shellfish.[15] Lastly, growers may require a place on land to store upweller equipment that is not in use (e.g., during the winter).[16] In Rhode Island, upwellers are often found at marinas and docks where growers can meet these conditions and water quality is appropriate.

2 How State Law Affects Nursery Siting

The state of Rhode Island controls all tidal waters below the high water mark.[17] The Rhode Island Coastal Resources Management Council (CRMC) regulates use and development of these waters, including permitting of aquaculture facilities.[18] In addition, the Rhode Island Department of Environmental Management (DEM) issues aquaculture permits which are required to sell shellfish in the state. This section focuses on how CRMC and DEM permitting and public health regulations affect nursery facility siting.[19]

2.1 CRMC Assent and Water Type and Use Classifications

CRMC regulations govern uses of coastal areas according to activity type and water classification. There are six water types defined in the regulations, ranging in intensity of use from Type 1 (conservation) waters to type 6 (industrial and commercial).[20] In Rhode Island, approximately 70 percent of the water that abuts the shoreline is classified as either type 1 or type 2 (residential).[21] Different activities are allowed by Council Assent (i.e., permit) or prohibited in each of these water types.[22] Activities that are not prohibited may be authorized under two types of assents.

14. *Id.* at 26.
15. *Id.* at 32.
16. *Id.* at 28.
17. *See* Greater Providence Chamber of Commerce v. State, 657 A.2d 1038, 1041 (1995) (discussing state title to submerged lands).
18. R.I. Gen. Laws § 20-10-3 (2013).
19. This section does not provide a comprehensive analysis of aquaculture siting and permitting requirements. Instead, it focuses on provisions most clearly relevant to siting of nursery facilities.
20. 650 R.I. Code R. 20-00-1.2.1(A)(2). Type 1 waters are found in conservation areas where "the construction of docks and any dredging, are considered . . . unsuitable." Type 2 waters abut residential areas, where docks are permitted but larger structures such as marinas are prohibited. Type 3 waters support commercial boating infrastructure, such as marinas and boatyards. Type 4 waters are found in "open waters of the Bay and Sounds . . . ." Type 5 and 6 waters support ports and industrial waterfronts. *Id.*
21. *Id.*
22. *Id.* § 1.1.5 (providing activity matrix for each water type).

Category A activities are eligible for streamlined review by CRMC so long as certain requirements are met, while Category B applications are subject to stricter requirements.[23] Aquaculture is identified as an activity category, as are the locations where nursery systems may be located, including (i) marinas; and (ii) residential docks, piers and floats.[24]

2.1.1 Aquaculture Assent and Stipulations

Aquaculture can be authorized in tidal waters (though prohibited in coastal wetlands) in all water types as a category B activity.[25] To obtain assent for a category B aquaculture project, a grower must first submit a preliminary determination application that is reviewed by CRMC and other agencies and stakeholders.[26] CRMC then provides a preliminary determination, after which the applicant can complete a full aquaculture application.[27] This application is reviewed again, including a public notice period and hearings (if CRMC receives objections).[28] CRMC will then approve the application and issue a lease (with conditions) or deny it.[29]

In practice, the assent process for aquaculture operations will identify site-specific limitations requiring modification of proposals, and, if approved, assents will include substantive conditions limiting how growers can conduct their businesses. Siting restrictions that may arise in permitting include prohibitions on locations that "contain significant shellfish stocks" or that pose "a navigation or public safety issue."[30]

Siting conditions may include stipulations preventing the use of upwellers on lease sites, particularly in the Rhode Island salt ponds where oyster aquaculture is prevalent. Notably, a common stipulation provides that "[v]essels, barges, or floating docks shall not be anchored or moored at the lease site, unless the permittee is actively engaged in operations such as setting or hauling cages, cleaning or harvesting."[31] This stipulation bars the use of FLUPSYs on leases where it is applicable, although submerged nursery methods remain feasible.

23. *Id.* § 1.1.6.
24. *Id.*
25. *Id.* § 1.1.5.
26. *Id.* § 1.3.1(K)(2)(c); Rhode Island Shellfish Management Plan 214 (Ver. II 2014).
27. Rhode Island Shellfish Management Plan 216 (Ver. II 2014).
28. *Id.*
29. *Id.* at 217.
30. 650 R.I. Code R. 20-00-1.3.1(K)(1).
31. CRMC Aquaculture Assent B2016-02-051 at 4 (Nov. 28, 2016, modified July 5, 2017); *see also* CRMC Aquaculture Assent No. B2016-03-024 at 4 (Oct. 12, 2016); CRMC Aquaculture Assent No. B2016-08-092 (May 1, 2017).

CRMC regulations contain two specific provisions reducing permitting burdens for nursery upwellers by classifying them as Category A activities.

- Nursery upwellers at "marinas, residential docks, and piers" are eligible for Category A review under certain conditions.[32] These conditions require that the upweller be proposed by (and all shellfish there owned by) an existing aquaculture leaseholder as an incidental use of the dock.[33] While aquaculture is allowed in all water types, however, upwellers cannot be added to existing docks in Type 1 waters (nor can new docks be placed in those waters).[34] This restriction limits where upwellers can be placed, although Type 2 waters are common in shellfish-producing areas.[35]

- Nursery upwellers also may be reviewed as category A activities when located within an approved marina perimeter limit, provided that the applicant received a Special Permit for Aquaculture for the activity from DEM.[36] The shellfish in such nurseries must also be transferred to an approved grow-out location before reaching a maximum size determined by DEM.[37]

2.1.2 Aquaculture conditions in assent for marinas and docks

Provisions governing siting and use of marinas and private docks—can affect nursery facility siting. Marinas and docks are reviewed under similar standards as "recreational boating facilities."[38] In these locations, nursery facilities require Council assent, but do not require leases because they are located in areas already leased to the dock or marina owner.

32. 650 R.I. Code R. 20-00-1 § 1.3.1(K)(2)(i).
33. *Id.*
34. *Id.*; *see also* 650 R.I. Code R. 20-00-1.2.1(A)(2). Docks in type 1 waters can remain if they were built before CRMC adopted the regulations and the dock is used in a manner that is "consistent with the public trust." *Id.* § 1.2.1(A)(2). *See also id.* § 1.3.1(D)(a) ("public trust resources means the tangible physical, biological matter substance or systems, habitat or ecosystem contained on, in or beneath the tidal waters of the state, and also include intangible rights to use, access, or traverse tidal waters for traditional and evolving uses including but not limited to recreation, commerce, navigation and fishing.").
35. *See* CRMC, Maps of Water Use Categories.
36. 650 R.I. Code R. 20-00-1.3.1(K)(2)(i).
37. *Id.*
38. *See id.* § 1.1.2 (defining "recreational boating facility").

New or changed residential docks, piers, and floats (including dockominiums) are allowed in all waters except type 1 waters.[39] These facilities may be reviewed as either Category A or a Category B activities, depending on the characteristics of the specific proposed activity.[40] CRMC authorizes marinas in type 3, 4, 5, and 6 waters as a Category B activity.[41] However, CRMC recognizes that few new marinas are likely:

> Areas suitable for marinas are severely limited, and the steady growth in the number of recreational boats is increasing the competition for the available facilities. Unfortunately, sheltered waters suitable for marinas are limited, and most of the remaining potential sites contain salt marshes that could only be developed at great environmental as well as high economic costs. Persons proposing new marinas are also hampered by local zoning and high land costs, and neighborhood opposition is frequently vociferous.[42]

Consistent with this policy, the regulations therefore support the continuation of existing marinas in type 2 waters.[43] Expansion by more than 25 percent at these marinas is prohibited, but "maintenance dredging, dock reconfigurations, activities such as travel lift operations and other best available technologies, and other ancillary activities necessary to maintain the operational viability of the facility" are expected to continue and are reviewed as recreational boating facilities.[44]

The recreational boating facilities provisions applicable to marinas and recreational docks contain some limitations on activities that can occur at those facilities. For example, "unloading of catches by commercial fishing vessels" is prohibited at recreational docks.[45] However, aquacultural use of these facilities is not specifically addressed in these regulations. As a result, the residential boating facility regulations do not meaningfully restrict the location of nursery systems at these locations when desirable.

39. *Id.* § 1.1.5(A)(2).
40. *Id.* § 1.3.1(D).
41. *Id.* § 1.1.5(A)(2).
42. 650 R.I. Code R. 20-00-1.2.1(C)(2)(c).
43. *Id.* § 1.2.1(B)(3)(b).
44. *Id.*
45. *Id.* § 1.3.1(D)(7)(c). This prohibition excludes shellfish growers unless they are using a vessel with a commercial fishing permit and unloading product for market. Even in such circumstances, it would not apply unless cultured product is considered to be a "catch."

2.2 DEM Permitting and Water Quality

DEM restricts the locations and operation of aquaculture facilities to protect public health. An aquaculture license from DEM is required to sell shellfish from an aquaculture lease or facility.[46] CRMC assent and an approved operational plan are required to obtain this license.[47] In addition, water quality at any aquaculture site must be appropriate for aquaculture activity.[48]

Rhode Island has implemented two forms of water quality classification. First, the DEM Office of Water Resources assigns all waters within the state to designated use classification.[49] Only those waters designated as "Class SA" are appropriate for shellfish cultivation for direct human consumption.[50] "Class SB" waters may be appropriate for relay and depuration.[51] However, in practice, DEM has not authorized private organizations to conduct relays from Class SB waters to date.[52] Second, DEM determines the pollution status of waters in compliance with the National Shellfish Sanitation Program (NSSP).[53] Under the NSSP, aquaculture is generally allowed only in "approved" or "conditionally approved" areas.[54] Cultivation in "restricted" or "conditionally restricted" areas may be allowed for relay or depuration.[55] Waters in or adjacent to marinas cannot be approved for harvest, but may be conditionally approved, restricted, or prohibited based on analysis of the waters.[56]

Nursery facilities may be appropriate for placement in restricted or conditional waters under these rules. These facilities do not produce shellfish for direct human consumption; rather, shellfish are transferred from nurseries to lease sites for grow-out. As a result, placement of nurseries in less pristine waters, including marinas, does not pose a risk to public health provided that growers ensure depuration of contaminants prior to sale for consumption.

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46. 250 R.I. Code R. 40-00-1.8.
47. *Id.*
48. *Id.* Land-based nursery facilities will require additional water discharge permits. Rhode Island Shellfish Management Plan 292 n.334 (Ver. II 2014). Water discharge permitting requirements are not covered in this study.
49. 250 R.I. Code R. 150-05-1.9.
50. *Id.* § 1.9(C).
51. *Id.*
52. Email from Robert Rheault, Executive Director, East Coast Shellfish Growers' Association, to Read Porter (Nov. 3, 2018).
53. R.I. Gen. Laws § 20-8.1-4. It is unlawful to take shellfish from areas determined to be polluted without approval from the Director of DEM. *Id.* § 20-8.1-5; 250 R.I. Code Regs. 90-00-4.7.
54. U.S. Food and Drug Admin., National Shellfish Sanitation Program (NSSP) Guide for the Control of Molluscan Shellfish: 2015 Revision § IV.03 (2015).
55. *Id.* § IV.03(D). Cultivation in such areas would not violate NSSP guidance but in practice require DEM approval, which may not be granted. Additionally, CRMC regulations prohibit private aquaculture leases within restricted areas that contain significant shellfish stocks available for relay. 650 R.I. Code R. 20-00-1.3.1(K)(4)(b).
56. U.S. Food and Drug Admin., *supra* note 54.

CRMC and DEM regulations work together to ensure that nursery upwellers in polluted waters do not pose risks to public health. These restrictions work by mandating the transfer of seed cultured in conditionally restricted or restricted areas to approved waters before reaching a maximum size. DEM defines the maximum size of "shellfish seed" for each organism; for example, oysters are no longer considered "seed" once they are larger than 1.25 inches.[57] DEM regulations require that "seed cultured in other than approved waters . . . must be transferred by the aquaculturist to an approved aquaculture lease in approved waters . . . prior to the shellfish exceeding the seed size limit."[58] Similarly, CRMC regulations require that, to receive Category A review, upwellers at marinas must provide proof that the nursery stock will be transferred to a permitted aquaculture facility, educational or research institution, or government agency before it reaches the maximum seed size.[59] Nursery facilities at residential docks, floats, and piers may be eligible for Category A review without providing such proof[60]—but will nonetheless need to detail their protections in their operational plans to receive a permit from DEM.

2.3 Pathogen Protection

The transportation of seed shellfish into different waterbodies can transfer shellfish disease. Rhode Island restrictions on the transportation of shellfish seed to prevent disease transmission may affect nursery facility siting.[61] Specifically, movement of shellfish seed may require approval from a "biosecurity board" within CRMC.[62] As explained in the Rhode Island Shellfish Management Plan:

> The board works to minimize potential outbreaks and movement of aquatic diseases with a goal of maintaining a healthy aquaculture and shellfish industry. The board creates shellfish zones around RI based upon current levels of shellfish disease. Shellfish cannot be moved between zones unless: a pathology report documents acceptable disease levels of the proposed shellfish to be moved; or the shellfish are being moved from an area known to have minimal disease to an area known to have a higher incidence of disease.[63]

57. 250 R.I. Code R. 40-00-1.7(A)(26).
58. *Id.* § 1.9(G).
59. 650 R.I. Code R. 20-00-1.3.1(K)(2)(h).
60. *Id.* § 1.3.1(K)(2)(i).
61. Rhode Island Shellfish Management Plan 216-17 (Ver. II 2014).
62. R.I. Gen. Laws §§ 20-10-1.1 (creating biosecurity board); 20-10-1.2 (vesting powers in board).
63. *Id.*

To avoid the cost and time associated with triggering the pathology testing requirement, Rhode Island growers may seek to locate their nursery site in the same biosecurity zone as their lease site. A map of biosecurity zones as established by the board is provided in Figure 1.

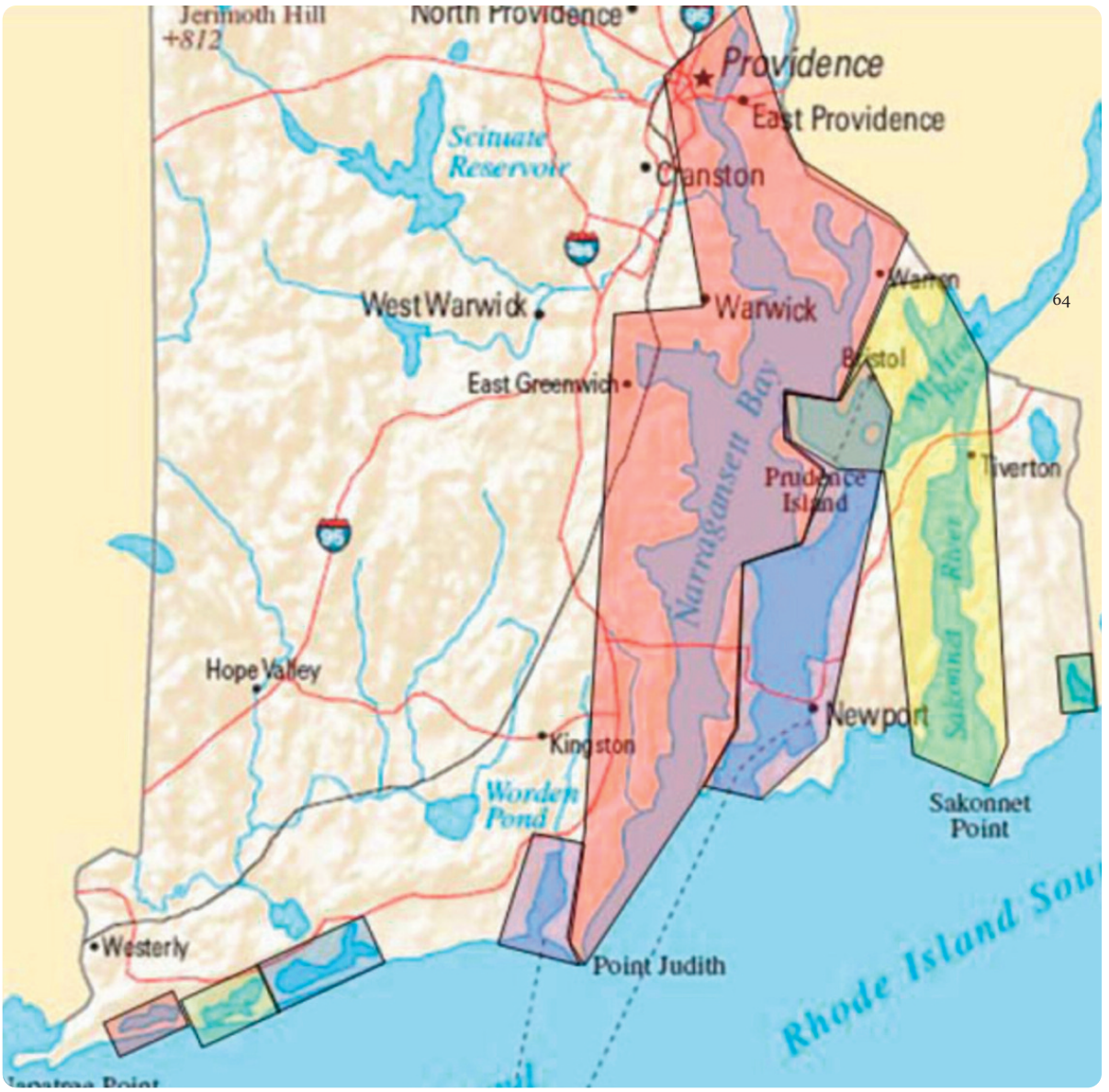

Figure 1. Rhode Island Biosecurity Zones[64]

64. CRMC Biosecurity Board, Meeting Minutes (Jan. 19, 2012).

3 Local Ordinances

Municipal ordinances—and particularly local land use and zoning restrictions—have the potential to influence the siting and operation of aquaculture facilities, including nurseries. As one recent study notes, "local ordinances related to dock access, shoreline and floodplain development, and agri-tourism are often enacted by municipalities wishing either to limit or foster aquaculture endeavors."[65] While Rhode Island municipalities lack legislative authority beyond the high tide mark, their ordinances have the potential to affect the use and creation of structures attached to land.

This section reviews local ordinances in three coastal Rhode Island municipalities to identify whether zoning restrictions may present challenges to nursery siting.[66] The three towns examined in this case study—Charlestown, Jamestown, and South Kingstown—were chosen due to their coastal location in proximity to active shellfish aquaculture operations.[67] This review of the zoning ordinances in these towns suggests at least three ways in which zoning could affect nursery siting, including: (i) special permitting of aquaculture as a regulated activity; (ii) zoning district limitations on the use of potential nursery areas for aquaculture nurseries; and (iii) conditions on permits required for marinas.

Ordinances in only one of the municipalities specifically mention aquaculture. Jamestown zoning ordinances define aquaculture as a regulated use and allow it with a special use permit in any zones other than conservation lands and the commercial downtown areas.[68] Thus, land-based and other nursery facilities requiring zoning approval can be placed in commercial waterfront (CW) zones, where marinas are located, and at residential docks.[69] A special use permit requires a public hearing and that the proposed project demonstrate a range of requirements, such as "[g]eneral compatibility with lots in the same or abutting zoning districts" and the effects of the use on neighboring lots.[70] This requirement to obtain a special use permit provides a mechanism for the town to limit where and how nursery facilities can be located.

65. Amanda Nichols, Nat'l Sea Grant Law Center, Zoning 101: A Stakeholder's Guide to Understanding the Zoning Decisions Impacting Shellfish Aquaculture Permitting, NSGLC 18-06-04, at 1 (2018).
66. This study does not consider potential restrictions on winter storage of gear, noise impacts, or other operational considerations. However, we note that such restrictions may affect the feasibility of nursery operations and are important considerations for growers.
67. *See* DEM, *Interactive Aquaculture Lease Map* (mapping all active aquaculture leases in Rhode Island).
68. Jamestown, R.I., Mun. Code § 82-301, Table 3-1 (land use table).
69. *Id.*
70. *Id.* § 82-600.

Even where existing zoning does not address aquaculture specifically, it could theoretically prevent the use of nursery locations. For example, Charlestown does not define aquaculture as a specific use type, so it could be considered several types of uses, such as hatchery, agricultural operations or a commercial use.[71] This determination would determine whether nursery facilities are consistent with zoning requirements in critical areas bordering salt ponds in Charlestown, which are primarily zoned for residential or open space.[72] Agricultural uses are allowed in all zones, while hatcheries are allowed in all but require a special use permit in residential areas, and most commercial activity is prohibited in residential zones and open space.[73] The town Building Inspector is responsible for this interpretation upon request.[74] This determination of the appropriate use category for aquaculture nurseries will have important implications for whether this use is allowed and, if so, whether a special use permit would be required.

Finally, waterfront zoning restrictions may limit aquaculture through zoning processes associated with marina development. For example, the fourteen marinas within South Kingstown exist in either the Commercial Waterfront zone ("CW") or a Public Marina Special Management District ("PMSMD").[75] Under either designation, development at marinas requires a special use permit.[76] Issuance of a special use permit requires a public hearing and may result in conditions, as explained by the town ordinances:

> [I]n granting a variance or special use permit . . . , the Board may apply such special conditions that may, in the opinion of the Board, be required to promote the intent and purposes of the Comprehensive Plan of the Town and this Ordinance.[77]

Such conditions could potentially limit (or require) the use of an approved marina for nursery facilities, even though the South Kingstown ordinances do not explicitly regulate aquaculture.

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71. CHARLESTOWN, R.I., MUN. CODE § 218a (land use table).
72. *See* CHARLESTOWN, R.I., *Interactive Zoning Map*.
73. CHARLESTOWN, R.I., MUN. CODE § 218a.
74. *Id.* § 218-35. While the Charlestown Building Inspector can allow unspecified uses, other municipalities prohibit any use not listed in the table. *See* SOUTH KINGSTOWN, R.I., MUN. CODE App. A § 300 ("Any use which is not specifically included in the use provisions of this article is prohibited, unless the Zoning Enforcement Official rules that such use is included in another 'Use Code'").
75. TOWN OF SOUTH KINGSTOWN, R.I., HARBOR MANAGEMENT PLAN 28, 46 (2010) (describing marinas, coastal zoning).
76. SOUTH KINGSTOWN, R.I., MUN. CODE at App. A § 301 (land use table).
77. *Id.* at App. A § 907.

This review of town zoning identified several ways in which such ordinances could potentially affect nursery facilities. However, it did not identify any indications that such effects are occurring today. In addition, it did not investigate the potential limitations on municipal authority to restrict aquaculture activity.[78] As a result, local land use limitations on nursery facility siting—and specifically on siting of FLUSPYs connected to land only by attachment to a dock—appears to remain limited to theory rather than practice.

4 Implications of Regulation for Nursery Siting

Shellfish aquaculture nursery siting depends on the interaction of the state and local laws discussed in Part 3. This section assesses how these disparate legal requirements affect nursery siting in practical terms, to identify whether and how they create impediments to or support for the deployment of this critical infrastructure in Rhode Island.

4.1 Rhode Island has established streamlined standards for floating nursery permitting

Shellfish growers will generally need both assent from CRMC and a license from DEM before they can site nursery facilities, and some nurseries may also require municipal permits. Some types of nurseries, such as submerged bag systems located on a lease area, may not require permitting beyond that undertaken for the lease and grow-out operations. Floating upwellers located off the lease area will require assent from CRMC, but can qualify for streamlined, Category A review if located at a marina or private dock.[79]

DEM permitting may not require substantial process if the nursery facility is detailed in the grower's operational plan and is located in appropriate waters.[80] However, land-based facilities are likely to require an additional permit for discharges that do not apply to floating facilities.[81]

Nursery facilities that have a connection to land may also trigger zoning approval under local ordinances. Some municipalities do not define where aquaculture is allowed, and others may require a special use permit (with conditions) for this use in all or certain areas, as detailed in Part 3. As a result, local approval has the potential to be a significant impediment when triggered.

78. Nichols, *supra* note 65, at 12-16 (reviewing issues limiting zoning of shellfish aquaculture).
79. 650 R.I. Code R. 20-00-1.3.1(K).
80. *See* 250 R.I. Code R. 40-00-1.8 (detailing DEM permit requirements).
81. Rhode Island Shellfish Management Plan 292 n.334 (Ver. II 2014).

4.2 Floating upwellers are restricted at lease sites, but authorized at marinas and private docks

Growers seeking to use a FLUPSY or other floating system may be able to deploy them only in certain areas. Some aquaculture permits, especially in the salt ponds, prohibit the use of floats or rafts at lease sites.[82] These prohibitions mean that FLUPSYs must be located off site or other methods must be used. Other assents may not include the same conditions, so careful review is needed to determine whether on-site upwellers are an option for particular growers.

By contrast, CRMC rules specifically endorse siting of FLUPSYs at marinas and private docks, easing the burdens for nurseries in these sites.[83] This location may be convenient for growers, who may be able to rely on power and regular access. However, attachment to land raises the possibility of local land use review. FLUPSYs at marinas or docks that do not connect to shore (e.g., are solar-powered) may avoid local review.

An upweller located in a marina may face water quality limitations based on designated uses and growing area classification.[84] However, DEM and CRMC regulations allow upwellers in restricted waters that may not be suitable for producing shellfish for direct human consumption—provided that shellfish seed is relocated to an approved grow-out location while still under a maximum size threshold.[85] By incorporating this consideration in operational planning during DEM review, the state seeks to protect public health without creating impediments to nursery systems.

CRMC water type classifications present a second restriction on floating upweller siting, as these facilities are not approved for Type 1 (conservation) waters.[86] While conservation waters may have ideal water quality for growing shellfish, many areas in other water types may also be appropriate and available. In particular, marinas may not be expected to occur in Type 1 waters.

82. *See supra* note 31 and accompanying text.
83. 650 R.I. Code R. 20-00-1.3.1(K).
84. 250 R.I. Code R. 150-05-1 § 1.9, 250 R.I. Code Regs. 90-00-4.7.
85. *See supra* note 57 and accompanying text.
86. 650 R.I. Code R. 20-00-1.3.1(K).

4.3 Biosecurity protections may restrict nursery siting in some areas

Rhode Island's provisions related to pathogen transmission create a potential siting challenge for shellfish growers in some areas. Nurseries must be located in the same biosecurity zone as the ultimate grow-out location to avoid pathogen testing prior to any transfer between facilities.[87] In some areas—notably, the smaller salt ponds along the state's southern coast and in areas with substantial areas classified as Type 1 waters—growers could have limited options for nursery locations meeting this criterion. In other areas, however, the biosecurity zones encompass large areas and may not prove serious impediments to nursery siting.

4.4 Local land use ordinances may present challenges for siting nurseries with a connection to shore

Nursery facilities located on shore or that are connected to shore (e.g., for power or water service) could trigger local land use approval requirements, as detailed in Part 3. These requirements could affect whether the nursery is allowed in the desired location, whether a special use permit is needed, and what conditions might be placed on its use. If a special use permit is required, impacts such as noise may be restricted. The specific requirements will depend on the municipality and the zoning district where the nursery is proposed. As a result, careful and site-specific consideration is needed to determine the effect of local ordinances on nursery siting.

5 Conclusion

Nursery facilities are critical to shellfish aquaculture in Rhode Island. This case study evaluated the legal requirements applicable to nursery facilities in the state, including CRMC regulations, DEM regulations, and local land use requirements. Consideration of these requirements suggests that legal requirements may restrict location of floating upweller systems on lease areas, but provide incentives for them at residential docks and marinas via streamlined permitting and allowances for location in restricted waters. Finding marinas and docks in the same biosecurity zone and in non-Type 1 waters may thus pose the primary challenges to siting of floating upwellers. Connection to land—whether for floating upwellers or land-based facilities—may raise issues of compliance with local land use law. Where applicable, additional permits and conditions may apply that restrict whether, where, and how these facilities can operate.

87. *See* Part 2.3, *supra* (detailing biosecurity board).

Guidance Materials on Starting or Expanding an Aquaculture Operation

Elizabeth Andrews, Director, & Angela King, Associate Director, Virginia Coastal Policy Center

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Photo by Stephanie Chavez/VASG.

As communities along coastlines expand, conflicts between riparian property owners and shellfish aquaculture operations may also increase, resulting in a variety of legal and regulatory issues facing landowners and the aquaculture industry. This case study focuses on the overarching framework of the bottomland leasing and permitting system utilized in Virginia, as well as other considerations that should be taken into account when starting or expanding an aquaculture operation. The Virginia Coastal Policy Center (VCPC) interviewed multiple individuals to identify priority law and policy barriers affecting the shellfish aquaculture industry within Virginia. Interviewees included:

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- Karen Hudson, Shellfish Aquaculture Specialist, Marine Advisory Services, Virginia Institute of Marine Science (VIMS);
- Tony Watkinson, Chief of Habitat Management, Virginia Marine Resources Commission (VMRC);
- Mike Oesterling, Executive Director, Shellfish Growers of Virginia;
- Karen Forget, Executive Director, Lynnhaven River NOW;
- Ben Stagg, Director of Shellfish Aquaculture Leasing and Mapping, VMRC; and
- Jennifer Beckensteiner, a doctoral student at VIMS.

Based on these interviews, the VCPC determined that the best way to help individuals through the Virginia permitting process was to create an easy to use "how-to-guide." The purpose of this guide is to identify the steps necessary to begin or expand an aquaculture operation in Virginia, and to answer common questions that aquaculturists often have during this process.

I. Background

Virginia is considered the "gold standard" for shellfish aquaculture.[1] Since the first European colonists arrived in the early 1600s, shellfish aquaculture has contributed to Virginia's economy.[2] Shellfish aquaculture, in the broad sense, includes husbandry of shellfish on private grounds in Virginia, whether wild or hatchery-raised. It is important to note that in some cases, the term shellfish aquaculture is only referring to the newly emerging sector, which is utilizing only hatchery-produced products. An example of this is the *Virginia Shellfish Aquaculture Situation and Outlook Report*.[3] This report summarizes survey responses from industry representatives that "gauge growth and inputs in Virginia's hatchery-based shellfish aquaculture industry."[4]

1. Laurie Schreiber, *From Seed to Market: How one oyster farmer leverages a growing market: Going to market* (Sept. 4, 2017) (quoting Julie Qiu, a blogger working with the Maine Sea Grant Program, Maine Aquaculture Association, and Maine Aquaculture Innovation Center).
2. *Preserving Virginia's Working Waterfronts*, Va. Dep't of Envtl. Quality.
3. Karen Hudson, Virginia Shellfish Aquaculture Situation and Outlook Report: Results of the 2017 Virginia Shellfish Aquaculture Crop Reporting Survey, Va. Inst. of Marine Sci. (July 2018).
4. *Id.* at 3.

Based on the industry survey conducted in early 2018, hatchery-produced shellfish from Virginia's clam and oyster industry was worth $53.4 million – $37.5 million for hard clams and $15.9 million for oysters.[5]

Other highlights of the report include identification of "Virginia [as] 1st on the East Coast of the U.S. for Eastern oyster production" and that "[o]ysters are the most rapidly developing sector of Virginia's shellfish aquaculture."[6] Virginia's bottom leasing program, combined with regulatory authority allowing structures 12 inches or less from the bottom on leased grounds without a permit, is extremely business friendly. The annual rent fee for leases is only $1.50 per acre.[7] However, since shellfish can also be grown in the water column (more than 12 inches from the bottom) and there may be land-based elements of the operation, federal regulations, state permit requirements, and local ordinances play a large role in how aquaculturists must plan and structure their operations. New aquaculturists attempting to enter the industry or existing aquaculturists looking to change their operations could benefit from guidance on the necessary steps to accomplish their goals.

II. Development of the Flow Chart and One-Page Summaries

As discussions with VIMS, VMRC, and the Shellfish Growers of Virginia continued, the idea of a how-to guide expanded into the creation of an electronically available interactive flow chart that maps the necessary steps for establishing an aquaculture operation according to the operation's purpose and structure. Users would work their way through a series of questions, such as: Would the shellfish be used for personal consumption or for commercial purposes? Would the shellfish be cultivated on bottomlands leased from the state? Would protective equipment, such as cages, be utilized? If so, would this equipment be placed on the bottomlands or within the water column?

The flow chart would be interactive in that at different decision points within the chart, hyperlinked PDFs of one-page summaries that expand on more complex topics would be available. The list below provides examples of one-page summary topics and the general content the summary would include.

5. *Id.*
6. *Id.*
7. VA. CODE ANN. § 28.2-612 (1992).

1. **The statutory and regulatory framework for shellfish aquaculture in Virginia:**
   Summarize the General Assembly's delegation of regulatory authority over state-owned bottomlands to VMRC, including enforcement responsibility.

2. **Finding a location for an aquaculture operation:**
   Explore two main subject areas, the Baylor Grounds and Private Grounds. For the Baylor Grounds, summarize the history behind the survey which established the boundaries for public oyster grounds in Virginia, how these boundaries may be modified, and how these public grounds may be used. For Private Grounds, discuss how private grounds may be leased, existing tools to assist with identification of available private grounds, and general environmental considerations – such as water quality, substrate conditions, submerged aquatic vegetation, and salinity.

3. **The different types of and how to obtain an oyster ground lease:**
   Discuss the different types of oyster ground leases – riparian and regular – and their general characteristics, such as eligibility to apply for each type of lease, associated application fees, required forms, and transferability.

4. **How to mark your lease area:**
   Identify the requirements for marking lease boundaries, including the type of markers and their required locations.

5. **The different types of and how to obtain an aquaculture permit:**
   Discuss the different situations where a state permit or the Joint Permit Application is required and the associated application fees, documentation, and public notice requirements. The National Sea Grant Law Center discusses this generally in its case study entitled *Shellfish Aquaculture Permitting under Nationwide Permit 48*.[8]

8. Amanda Nichols, *Shellfish Aquaculture Permitting under Nationwide Permit 48*, *supra* at page 15.

6. **Local government regulations to take into account when planning an aquaculture operation:**

   Identify and briefly explain different local government regulations to consider with respect to aquaculture. Examples include business license requirements, zoning designations, and the Chesapeake Bay Preservation Act.

7. **Required training for aquaculturists:**

   Explain the mandatory training requirements, including where the training is available, what it covers, how much it costs, and how often it must be done.

8. **Required license and user fees:**

   Discuss mandatory license and user fees, including when they apply and their cost.

9. **Mandatory harvest reporting:**

   Explain the mandatory harvest reporting requirement, including how often it must be completed, what information it must contain, and where to submit the report.

10. **Bond requirements:**

    Detail the reasoning for bond requirements, when a bond is required, how much it costs, and how to obtain one.

11. **Additional topics that arise during the development of the tool:**

    As the tool evolves and additional feedback is received, it may be necessary to include additional one-page summaries to provide clarification on additional topics.

III. Next Steps

VCPC will continue to coordinate with VIMS, VMRC, and the Shellfish Growers of Virginia to develop a flow chart that is electronically available and interactive. Initial steps are to finalize the decision points for inclusion in the flow chart and topic areas for the one-page summaries. Once the decision points are finalized, it may be necessary to coordinate with other partners

skilled in graphic design and digital communication to develop a flow chart that is both visually pleasing and user friendly. As VCPC drafts the one-page summaries, VIMS and VMRC will provide expert review to ensure that the information contained within each summary is accurate and complete. Once the flow chart and one-page summaries are finished, a test of the tool would be beneficial to confirm its usability. For example, VCPC could work with individuals interested in aquaculture or with current aquaculturists to determine if they find the tool informative and easy to use. After taking feedback received from the test into account, the final step would be to determine where to post this tool and identify the party responsible for updating the tool in the future.

Managing Use Conflicts on the Lynnhaven River

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This case study focuses on the relationship between aquaculturists, homeowners, the state regulatory agency, and legislators in Virginia, specifically events surrounding the resurgence of aquaculture in the Lynnhaven River (the "Lynnhaven" or the "River") as water quality has improved. The case study explores the background behind the conflicts on the River, summarize attempts to provide resolution, discusses the handling of similar use conflicts in other parts of the country, and provides recommendations for next steps in dealing with the conflicts.

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I. The Lynnhaven River – Water Quality and Aquaculture

The Lynnhaven River is the largest tidal estuary in Virginia.[1] Located entirely within the City of Virginia Beach, the Lynnhaven River Basin covers sixty-four square miles and includes one hundred and fifty miles of shoreline.[2] The area is urbanized and densely populated, with approximately 225,000 people – more than half of the City's population – and almost 4,500 single-family homes.[3] Additionally, the area includes public access points, marinas, boat launch facilities, waterside restaurants, and First Landing State Park, which commemorates the 1607 landing of the settlers who eventually formed Jamestown, the first permanent English settlement in North America.

Historically, the Lynnhaven was a bountiful oyster-producing tributary. The River's long growing season, salinity levels, and nutrient rich intertidal areas make it a prime area for oyster aquaculture. According to journals kept by George Percy, who sailed with Captain John Smith, in 1607 a landing party went ashore at Cape Henry and surprised a group of Native Americans eating oysters.[4] The oysters became known for their salty taste and large size. Diamond Jim Brady is said to have indulged in three dozen Lynnhaven oysters in one sitting and Sinclair Lewis wrote about Lynnhaven oysters in *Babbitt and Main Street*.[5] Additionally, after attending an oyster roast at Cape Henry, President Taft "declared that with oysters never so good to him before he had eaten so many that he felt like an oyster."[6]

Unfortunately, water quality concerns started to take a toll as early as 1930, when the Virginia Department of Health's Division of Shellfish Sanitation (VDH) closed a section of the River to shellfish harvesting due to high levels of fecal coliform bacteria.[7] In 1971, VDH closed the entire River to shellfish harvesting.[8] The Virginia Department of Environmental Quality (DEQ) listed the Lynnhaven as impaired under Section 303(d) of the Clean Water Act in 1998.[9] DEQ developed a Total Maximum Daily Load (TMDL) for the Lynnhaven for fecal coliform in

1. *Lynnhaven River Ecosystem Restoration*, U.S. Army Corps of Eng'r.
2. *Id.*
3. *Lynnhaven River Watershed Application for Federal No Discharge Zone Designation*, Va. Dep't of Envtl. Quality.
4. Peggy Sijswerda, *Salty, Slippery & Delicious*, Virginia Living (Dec. 3, 2010).
5. *Id.*
6. Krys Stefansky, *A Home Fit for a President*, The Virginian-Pilot (Nov. 9, 2009).
7. *Lynnhaven River Watershed Application, supra* note 3.
8. *Annual Report of the Department of Conservation and Recreation*, Va. Dep't of Conservation & Recreation 55 (2009).
9. *Id.* at 1.

2004 and began TMDL implementation in 2006.[10] Subsequently, 27 percent of the River opened to shellfish harvesting in 2007 – the first commercial harvest in decades – and currently 47 percent is open.[11]

II. Improved Water Quality and Conflicting Uses

Water quality improvement within the Lynnhaven resulted from a combination of regulatory action and local stakeholder engagement.[12] When it formed in 2002, the nonprofit organization Lynnhaven River NOW set the ambitious goal of people being able to eat Lynnhaven oysters by 2007 – in time for the 400th anniversary of the English landing at Cape Henry. Having a goal that people could truly understand and relate to, instead of speaking in terms of pollutant levels and water quality, was key to the organization's success.[13] The clearly defined goal and concrete benefit of being able to consume a Lynnhaven oyster made it easier for the public to understand the purpose of the proposed actions. Collaborative partnerships were also key. In addition to an active nonprofit organization, the local government was on board as well. A city employee served as the first Executive Director of Lynnhaven River NOW, which helped to foster trust and cooperation between the two entities.[14]

Increases in Virginia Beach's population along the waterfront, coupled with the growth of nearshore aquaculture operations as the River reopened to shellfish harvesting, have led to conflicts concerning the use of the River. As aquaculture farming methods have shifted from traditional on-bottom operation to the use of cages closer to shore, riparian property owners have voiced concerns about privacy, noise, property values, boating safety, and water access.[15] Concerns for recreational users include safety and water access, and for business owners along the shoreline there are aesthetic concerns related to noise and visual impacts of aquaculture operations. On the other hand, the interests of the aquaculturists focus on the importance of their economic livelihood, the contribution of the industry to the Commonwealth's economy,

10. *Section 319 Nonpoint Source Program Success Story,* EPA (2009).
11. *Total Maximum Daily Loads At Work In Virginia: Restoring The Legendary Lynnhaven Oysters,* EPA; *2015 Annual Report*, Lynnhaven River Now.
12. Shana Campbell Jones, *Making Regional and Local TMDLs Work: The Chesapeake Bay TMDL and Lessons from the Lynnhaven River*, 38 Wm. & Mary Envt'l L. and Pol'y Rev., 277, 306 (2014).
13. Morris, John C. et al., *Collaborative Federalism and the Emerging Role of Local Nonprofits in Water Quality Implementation*, 44 J. of Federalism, 508-09 (2014).
14. *Id.*
15. *Lynnhaven Work Group Presentation,* Va. Marine Res. Comm'n [hereinafter *Lynnhaven Presentation*].

water quality improvements, the history of aquaculture within the area, and their adherence to the existing regulatory process that is in place to manage the resource.[16]

Specifically at issue in this situation is the use of on-bottom cages, or cages no more than twelve inches above the substrate. Provisions regarding the leasing, growing, and harvesting of shellfish are found within the Virginia Code and Virginia Administrative Code. Virginia Code § 28.2-603 authorizes the Virginia Marine Resources Commission (VMRC) to lease certain oyster grounds for the planting or propagating of oysters. VMRC regulations allow for the placement of on-bottom cages within leased grounds without the need for any additional permits or authorizations.[17]

In 2016, there were 165 regular oyster ground leases comprising 2,397 acres in the Lynnhaven River. These leases were held by 55 individual leaseholders. Of that, the approximate area being used for on-bottom cage aquaculture was 9.93 acres – approximately 0.004 percent of the total leased area.[18]

III. Proposed Legislation and Resulting VMRC Workgroup

Prompted by complaints from waterfront property owners regarding the impact of aquaculture operations,[19] Senator Bill R. DeSteph, Jr. (R-Virginia Beach) introduced multiple aquaculture-related bills during the 2016 General Assembly. For example, he introduced Senate Bill 298[20] to increase the annual rent associated with a general oyster ground lease from $1.50 an acre to $5,000 an acre and Senate Bill 254[21] to suspend the Virginia Marine Resources Commission's assignment or transfer of general oyster grounds within the Lynnhaven River until July 1, 2017.

Although Senator DeSteph ultimately withdrew both bills from consideration,[22] their introduction prompted a conversation on the issues surrounding the Lynnhaven. Recognizing the need to

16. *See, e.g.*, Noah Trombly et al., *Working Waterfronts: On History, Conflicts, and Finding a Balance; Case Studies of the Lynnhaven River, the Ware River, and the Eastern Shore of Virginia*, VA. COASTAL POLICY CTR. Section III(B) (2016); Dave Mayfield, *Virginia Regulators Leave Lynnhaven Oyster Rules Unchanged; Lawmakers Invited to Weigh In*, The Virginian-Pilot (September 27, 2016); Dave Mayfield, *Lynnhaven Group Passes Along Proposals to Ease Oyster Conflicts*, The Virginian-Pilot (July 29, 2016).
17. 4 VA. ADMIN. CODE § 20-335-30 (2016).
18. *Lynnhaven Presentation, supra* note 15.
19. Will Armbruster, *Legislator withdraws bill raising oyster leases*, ABC 8 NEWS (Jan. 29, 2016).
20. S.B. 298, Gen. Assemb. (Va. 2016) (proposed bill).
21. S.B. 254, Gen. Assemb. (Va. 2016) (proposed bill).
22. *See* proposed bills, *supra* notes 20 and 21.

explore these conflicts further, VMRC placed a moratorium on new leases in the Lynnhaven and formed a study group of thirteen stakeholders to "review and make recommendations to address use conflicts associated with the commercial use of leased oyster ground and impacts to properties and other uses of the waterway within the heavily utilized Lynnhaven River System."[23] The thirteen stakeholders included four individuals with ties to the aquaculture industry, one VMRC associate commissioner, one nonprofit organization representative, one police officer, and six property or business owners along the Lynnhaven.[24] Over a period of four months, the workgroup met multiple times in Virginia Beach, as well as at VMRC's main office in Newport News. One meeting was a river field trip that enabled workgroup members to observe and review the aquaculture activity in person.[25]

Workgroup members identified fifteen potential topic areas for discussion:

1. Lease application notification process,
2. Lease marking and marking of aquaculture structures,
3. Liability for leaseholders and boaters,
4. Visual impacts of markers and cages,
5. Property value (highland or upland) impacts,
6. Safety issues,
7. Navigation issues,
8. Prohibition of dredging through leased areas,
9. General user conflicts (commercial/recreational),
10. Lease term limits,
11. Lease use plan requirements,
12. Designation of areas not to be leased,
13. Abandoned gear,
14. Riparian rights and riparian shellfish leases, and
15. Leasing areas as a "land grab" – not for aquaculture operations, but to bar others from leasing the area.[26]

23. *Commission Actions Jan. 26, 2016*, Va. Marine Res. Comm'n (2016).
24. E-mail from Ben Stagg, Director, Shellfish Leasing and Mapping, Engineering/Survey Department, Va. Marine Res. Comm'n (September 26, 2018) (on file with author).
25. *Report of Recommendations from the Lynnhaven River Shellfish Workgroup*, Va. Marine Res. Comm'n 1 (2016).
26. *Id.* at 1-2.

Workgroup discussion of these topics resulted in seven recommendations. Five of the recommendations had a split vote. These included modifying the regulation regarding on-bottom structures to require a permit for such structures; if no permit required for on-bottom structures, then require a buffer between the structures and adjacent property; close certain designated areas of the Lynnhaven to leasing; provide VMRC with the authority to require a use plan for leases; and support a revision of the Code of Virginia to allow municipal dredging projects through leased grounds to proceed with compensation to the leaseholder. The two unanimous recommendations were requiring boater safety courses to include aquaculture education and improving the adjacent property owner notification process associated with oyster ground leases.[27]

VMRC considered the workgroup's recommendations, but ultimately chose not to amend its regulations governing oyster leases.[28] As a result, in the Virginia General Assembly's 2017 Session, additional aquaculture bills were introduced. Senate Bill 1145[29] and House Bill 2298[30] proposed reducing the amount of linear shorefront required for a property owner to quality for a riparian oyster ground lease. Senate Bill 1144[31] and House Bill 2297[32] proposed revisions to the notification procedure associated with oyster planting grounds, requiring that VMRC not only provide notification via newspaper but also on the VMRC website and via mail to adjacent property owners. While the proposed reduction in shorefront to qualify for a riparian lease did not succeed, the revised notification procedure passed.[33]

As a result, the number of protested oyster ground lease applications increased. Currently, approximately 25-30 percent of the applications are protested.[34] Protests may be filed for any reason and can sometimes draw out the application process for years.[35] If the protest cannot be resolved, a public hearing is held at a regular VMRC meeting. Final action regarding the lease application is based upon a staff report and recommendation, as well as any comments

27. *Id.* at 2-6.
28. *Commission Actions Sept. 27, 2016*, Va. Marine Res. Comm'n (2016).
29. S.B. 1145, Gen. Assemb. (Va. 2017) (proposed bill).
30. H.B. 2298, Gen. Assemb. (Va. 2017) (proposed bill).
31. S.B. 1144, Gen. Assemb. (Va. 2017) (proposed bill).
32. H.B. 2297, Gen. Assemb. (Va. 2017) (proposed bill).
33. *See* proposed bills, *supra* notes 29 and 30; *see also* Va. Code Ann. § 28.2-606 (2017).
34. Interview with Ben Stagg, Director, Shellfish Leasing and Mapping, Engineering/Survey Department, Va. Marine Res. Comm'n (Feb. 12, 2018).
35. *Id.*

received prior to or during the public hearing. VMRC actions are appealable to the Circuit Court in the locality where the application is located.[36]

Although the revised notification procedure addressed some of the concerns raised by the workgroup, significant issues remain within communities along the Lynnhaven and other waterways in the Commonwealth. Therefore, additional action is needed to sufficiently manage these use conflicts.

IV. Management of Similar Use Conflicts

To guide the development of potential solutions, the Virginia Coastal Policy Center reviewed approaches taken to similar use conflicts – specifically, the balancing of use conflicts on the York River in Gloucester County, Virginia; geoduck farming within the Puget Sound in Washington State; and livestock grazing permits on federal public lands in the midwest.

York River Use Conflict in Gloucester County

The Middle Peninsula Planning District Commission (MPPDC) identified water use conflict as the top priority during its Legislative Program Development Process in 2006.[37] Recognizing the shift from an historical working waterfront to residential development along the shoreline, the MPPDC established the York River Use Conflict Committee to evaluate use conflicts and provide public policy recommendations for local governments to address the conflicts.[38] The committee included representatives of local government, water-dependent industry, and environmental nonprofit organizations, as well as a scientist from the Center for Coastal Resources Management at the Virginia Institute of Marine Science.[39]

Feedback and discussion from a public forum on the topic held by MPPDC and the National Oceanic and Atmospheric Administration's Virginia Sea Grant Coastal Communities and Development Program served as the foundation of the committee's work.[40] Educational materials were developed to ensure that all members had a common understanding of the uses on the

36. *Oyster Ground Leasing Public Information Session,* Hampton Cmty. Dev. Dep't & Va. Marine Res. Comm'n (2014). *See also* Va. Code Ann § 28.2-1205(F) (2005).
37. *York River Use Conflict Committee Report and Recommendations*, § 1, p. 3 (2008).
38. *Id.*
39. *Id.*, at Acknowledgements 1.
40. *Id.* at § 2, p. 6.

York River and the legal and regulatory framework governing those uses.[41] Committee members took part in facilitated meetings, completed homework assignments, and visited the site of a commercial aquaculture operation.[42] Additionally, Virginia Sea Grant funded a GIS analysis to identify water-dependent uses, current regulations, existing infrastructure, proposed public improvements, and ecosystem habitats in portions of Gloucester County.[43]

After the educational phase of the committee's work, members completed template worksheets to identify various uses within the jurisdiction of local government and began to identify and prioritize conflicts associated with those uses.[44] First, members analyzed the relationship between various governmental units and the combination of use categories. Second, members created a matrix to identify the issue areas associated with various conflicts. This process enabled members to consider both sides of the conflict at issue.[45]

The committee unanimously agreed upon seven recommendations for Gloucester County, and proposed action steps for each recommendation. The recommendations included the development and adoption of a coastal living policy; designation of the County's land, air, and water boundaries within the Comprehensive Plan and supporting maps; taking no action with respect to the regulation of aquaculture within the County's jurisdiction; development of a policy for the protection of working waterfront infrastructure; development of a waterfront outdoor lighting ordinance; adoption of an ordinance to restrict floating homes; and development of a master plan for public access infrastructure.[46]

The Gloucester County Board of Supervisors approved all seven recommendations.[47] Ultimately, the County has not adopted ordinances for waterfront outdoor lighting or restrictions on floating homes. The County has done some work with respect to drafting a coastal living policy and working on a master plan for public access, but neither of these are complete.[48] The County did include designations of its land, air, and water territorial boundaries within

41. *Id.* at § 3, p. 7.
42. *Id.*
43. *Id.* at § 2, p. 6.
44. *Id.* at § 4, p. 18.
45. *Id.* at § 4, p. 19.
46. *Id.* at § 5, pp. 22-33.
47. Gloucester Cty. Bd. of Supervisors, *Feb. 17, 2009 Meeting Minutes* 1, 7-10 (2009).
48. E-mail from Anne Ducey-Ortiz, Dir. of Plan. and Zoning, Gloucester Cty. (May 30, 2018) (on file with author).

its Comprehensive Plan[49] and amended the definition of aquaculture within its zoning ordinance[50] to specify that the County does not regulate aquaculture beyond mean low water. The County has included the protection of working waterfronts as a goal within its Comprehensive Plan and is working on adopting zoning to create a working waterfront district.[51]

Geoduck Farming in Puget Sound, Washington

The expansion of commercial geoduck farming in Puget Sound has led to opposition from waterfront property owners and conservationists because of concerns related to the environmental impact of the operations.[52] Geoducks are large clams found in the tidelands that weigh an average of 2.07 pounds when mature.[53] On the one hand, a permitted geoduck aquaculture operation brings economic benefit to the region.[54] On the other hand, there are concerns regarding the impacts on aesthetics, recreation, land use, and the environment.[55] The aquaculture operations at issue include placing seed clams in the sand and then protecting the clams with PVC tubes that are draped with netting. After two years, the geoducks are burrowed safely underground and the protective gear is removed. To extract mature geoducks, low-pressure water hoses are used to liquefy the surrounding sediment.[56]

In 2007, the Washington State Legislature requested that Washington Sea Grant establish a research program to evaluate the possible effects of geoduck aquaculture in Puget Sound.[57] Although this research, conducted from 2007 to 2013,[58] found no serious impact, it did little to ease the concerns of waterfront property owners and conservationists regarding the environmental impact of geoduck operations. Therefore, Washington Sea Grant conducted a two-year study into the social and policy aspects of the conflict.[59]

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49. *Gloucester County Comprehensive Plan*, Gloucester Cty., Va. (Feb. 2016).
50. Gloucester Cty., Va., Code of Ordinances App. B, Art. 2, § 2-1 (2017).
51. E-mail, *supra* note 48.
52. Laura Wilson, *Washington Sea Grant researchers seek paths forward in local conflicts over geoduck farming*, NOAA & Sea Grant, News (Aug. 1, 2017).
53. *Fishing & Shellfishing*, Wash. Dep't of Fish & Wildlife.
54. C.M. Ryan et al., *Digging Deep: Managing Social and Policy Dimensions of Geoduck Aquaculture Conflict in Puget Sound, Washington*, 45 J. Coastal Mgmt. 73, 74 (2017).
55. *Id.*
56. *Id.*
57. *Id.*; S.S.H.B. 2220, Gen. Assemb. (Wash. 2007); Final Report, Geoduck Aquaculture Research Program, S. Agric., Water & Rural Econ. Dev. Comm. et al. (2013).
58. Final Report, *supra* note 57; *Shining a Light*, Washington Sea Grant.
59. C.M. Ryan et al., *supra* note 54.

There were two key elements of the study. First, stakeholder interviews were conducted to determine the main areas of concern.[60] Representatives of industry, government, environmental organizations, and homeowners were asked a series of open-ended questions that enabled the study team to identify six main categories of concern: aesthetic, recreational, land-use, ecological, political/regulatory, and economic.[61] Second, hearing board decisions[62] were analyzed to identify common themes. A review of nine decisions found similar concerns to those identified in the stakeholder interviews – ecological, aesthetic, and recreational impacts from the industry.[63]

Ultimately, the study recommended three strategies to build trust between the stakeholders. First, best management practices for the industry should be practiced and publicized, such as "harvest time and consideration for spawning fish[.]"[64] Second, best available science should be explicitly incorporated into the permitting process. And third, stakeholders should work together to collect data and analyze facts to reach shared decisions on the issues. The study was just published in 2017, so it is too soon to analyze its impacts at the time of publication of this case study.

Livestock Grazing Permits on Federal Public Lands

Conflicts related to livestock grazing on federal public lands came to the forefront during the Bundy cattle trespass situation in Nevada in 2014,[66] and again during a militia's occupation of public lands at Malheur National Wildlife Refuge in Oregon in 2016.[67] Both situations exemplified the ongoing property rights conflict associated with livestock grazing permits on federal public lands in the western United States, as farmers and ranchers conflict with federal agencies over land management decisions.

60. C.M. Ryan et al., *supra* note 54, at 73-89.
61. *Id.*
62. "Washington State has established three environmental and land use hearings boards, which provide quasi-judicial forums that can shape policy. The Shorelines Hearings Board responds to appeals regarding the compliance of permits with the state's [Shoreline Management Act], the Growth Management Hearings Board addresses land-use disputes, and the Pollution Control Hearings Board hears appeals regarding decisions made by [state] agencies." *Id.* at 78-9.
63. *Id.* at 73-89.
64. *Id.* at 83.
65. *Id.* at 85-86.
66. Andrew Prokop, *The 2014 controversy over Nevada rancher Cliven Bundy explained*, Vox (May 14, 2015), (rancher grazed cattle on public land without paying the required fees and a stand-off resulted when the federal government came to confiscate the cattle).
67. Tay Wiles, *Malheur occupation, explained*, High Country News (Jan. 4, 2016), (individuals occupied the Refuge because of their belief that the federal government should return public lands to the state for management).

The United States Bureau of Land Management manages approximately 18,000 livestock grazing permits on 155 million acres of its land.[68] Additionally, the United States Forest Service's (USFS) federal grazing program includes almost 6,000 permittees and covers more than 100 million acres of its land.[69] BLM livestock grazing permits are issued for up to ten years and include additional conditions related to the classification of livestock, the allotment to be used, amount of use, and period of use.[70] Applicants must own or control base property, meaning private property that can serve as a base for the livestock operations.[71] Additionally, applicants must own or control livestock[72] and adhere to the allotment management plans or other applicable activity plans included within the permit's terms and conditions.[73] Similar timeframes and requirements also apply for USFS term grazing permits.[74]

At the core of such conflicts are whether grazing permits are categorized as rights or privileges.[75] While the Taylor Grazing Act of 1934[76] – which created the basis of current federal grazing policy – clearly states that grazing permits "shall not create any right, title, interest, or estate in or to the lands[,]"[77] the grazing permits are intricately tied to base property.[78] As competing uses, such as conservation and recreation, have gained support and pressured federal agencies to reduce the terms and conditions associated with grazing permits, permittees have expressed concern about the impact on their base property values and the overall sustainability of their grazing operations.[79]

One approach used to help resolve these conflicts is that environmental organizations have purchased base properties and the associated federal grazing permits. For example, a conservation group called The Grand Canyon Trust purchased base properties and the associated federal grazing permits to further their conservation strategies. However, due to

68. *Livestock Grazing on Public Lands*, Bureau of Land Mgmt.
69. *Grazing Statistical Survey*, U.S. Dept. of Agric. 1 (2016).
70. 43 C.F.R. § 4130.3-1 (1995).
71. *Id.* § 4100.1(a) (1995).
72. *Id.* § 4130.7 (1995).
73. *Id.* § 4120.3(d) (1996).
74. 36 C.F.R. § 222.3 (1981).
75. Shawn Regan, *Managing Conflicts Over Western Rangelands*, PERC (Jan. 21, 2016).
76. 43 U.S.C. §§ 315-315(r) (1934).
77. *Id.* § 315(b).
78. Regan, *supra* note 75, at 4.
79. *Id. See also Christi Turner, Rancher vs the BLM: A 20-year standoff ends with tense roundup*, High Country News (Apr. 11, 2014),

the desire to retain control of the grazing permits, the group ended up purchasing the minimum number of cattle required under the permits.[80] The Nature Conservancy (TNC) purchased Dugout Ranch in Utah and the associated federal grazing permits. Again, to avoid losing control of the grazing permits, TNC continued to utilize the ranch as a livestock operation.[81] Other groups have purchased the base properties and retired the associated grazing permits via an agreement by the BLM or USFS to formally change the area's management plan and cancel the grazing allotment.[82] However, these management plans are typically revised every 10 or 15 years, at which time the grazing allotment could be re-opened.[83]

While innovative approaches for overcoming regulatory barriers are possible, overall the conflicts would be reduced and mutual solutions between conservation groups and ranchers would be more common if those barriers did not exist and property rights were better defined. Additionally, more permanent solutions could be developed to provide greater certainty in these situations. For example, while some organizations have attempted to address the situation by purchasing base properties and retiring the associated grazing permits, these decisions can be changed at a later date. These conflicts underscore the need for the legal and regulatory framework to match the overarching policy goal for management of the natural resource.

A significant step was taken in September 2017, when BLM began an outcome-based grazing initiative meant to improve the management of grazing on public lands by offering more flexibility for farmers and ranchers to respond to on-the-ground conditions.[84] Rather than the typical grazing authorization that is based on process and prescription, the outcome-based approach seeks to emphasize conservation performance, ecological outcomes, and cooperative management of public lands.[85] In March 2018, BLM announced eleven Outcome-Based Grazing Authorizations to serve as demonstration projects for the program that will serve as models for the development of guidance and best management practices for future authorizations under the program.[86]

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80. Regan, *supra* note 75, at 22-23.
81. *Id.*
82. *Id.* at 27.
83. *Id.*
84. Livestock Grazing, *supra* note 68.
85. *BLM Offers Livestock Operators Increased Flexibility Through Outcome-Based Grazing Authorizations*, Bureau of Land Mgmt.
86. *BLM Announces Outcome-Based Grazing Projects for 2018*, Bureau of Land Mgmt.

V. Recommendations

The formation of an additional stakeholder workgroup to undertake a comprehensive evaluation of the legal and regulatory framework associated with aquaculture in the Commonwealth is needed to adequately address these use conflicts.[87] As noted with similar use conflicts along the York River, in Puget Sound, and on federal lands in the western United States, a key element of use conflict resolution is to foster the development of trust among the various stakeholders through communication and education. Early stakeholder involvement and communication, as well as public outreach efforts, are critical to successful information gathering and issue framing.

In designing the process for stakeholder engagement, there are multiple elements to consider. First, in forming the stakeholders group it is important to identify representatives of as many viewpoints as possible, and to have all viewpoints represented in a balanced manner. Second, stakeholder meetings should be facilitated to ensure the formation of proper ground rules and development of a comprehensive work plan with full participation by all. Third, stakeholders should be provided with clear expectations of the group's role and how its work will be utilized. The discussions should be focused toward development of permanent solutions, to avoid recurring revisitation of the issues as gubernatorial administrations change. Fourth, adequate time must be given to discussing and listening to all viewpoints in order to build trust between stakeholders and regulators. Fifth, stakeholders should be briefed on regulatory approaches used successfully in other states, to encourage innovative thinking.

Early in the process, a public forum or other method of soliciting information should be employed to gauge the level of stakeholder knowledge associated with different aspects of the issue and determine what type of information is needed to bring individuals within the group to common understanding. The recommendations of the 2016 VMRC workgroup could be incorporated into this process for further consideration. For example, if a pre-meeting survey is provided to identified stakeholders, one piece of information to solicit could be their thoughts

87. The Virginia Secretary of Natural Resources formed an Aquaculture Work Group in Summer 2018 to address a limited range of issues related to aquaculture in Virginia. Secretary of Natural Resources Matthew Strickler Convenes Work Group to Promote Sustainable Growth of Virginia's Clam and Oyster Economy, Press Release, Va. Office of the Governor, (Aug. 16, 2018). The work group is still underway at the time of publication of this case study, and it is an advisory group to the Secretary so its meetings are closed to the public. It is therefore unknown at this point whether the work group will make any consensus recommendations that could be adopted by the Virginia General Assembly. Additionally, its focus on certain specific issues in a limited timeframe means that the group probably will not develop permanent solutions for all of the conflicts.

associated with the recommendations provided by the 2016 workgroup. It would be important to craft the associated survey questions in a manner to obtain information on not only whether stakeholders support or oppose the policy recommendations, but also the reasons for their positions. When there is a common understanding of the perspectives associated with the various uses of the natural resource, the parties involved are better equipped to work toward a collaborative solution.

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Growing Oysters in Georgia: An Overview of the Legal Framework

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In the early 20th century, Georgia led the nation in producing oysters with more than eight million pounds harvested annually.[1] Harvested primarily for the canning industry, Georgia oysters were valued for their "intensely salty" taste tinged with lemongrass.[2] Until the 1930s, Georgia led the country with 13 canneries, but production plummeted in the 1950s. Oysters were then primarily sold as a canned product until the mid-1960s when Georgia's last oyster shucking house closed its doors.[3] By the 1970s, less than 100,000 pounds were landed annually.[4]

1. Thomas Bliss and Randal Walker, *Reducing the Minimal-Legal Harvest Size of Oysters in Georgia*, Occasional Papers of The University of Georgia Marine Extension Service Vol. 14, 2012 (hereinafter "Bliss & Walker, *Reducing Harvest Size*"); Sea Grant, National Oceanic and Atmospheric Administration; Emily Woodward, *Sustainable Aquaculture: Georgia Sea Grant Opens State's First Oyster Hatchery*, Georgia Sea Grant (Oct. 27, 2016).
2. Mary Landers, *Georgia Perfects the Lonely Oyster*, Bluffton Today (Jan. 20, 2016).
3. *A Blueprint for Oyster Aquaculture in Georgia 2017-2022*, Georgia Sea Grant, Ga. Dep't of Natural Res., & Ga. Dep't of Agric. [hereinafter "Georgia Blueprint"].
4. Bliss & Walker, *Reducing Harvest Size*, *supra* note 1, at 1.

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Georgia's oyster stock reached 28,467 pounds in 2017.[5] While over-harvesting and fisheries mismanagement were the primary causes of the oyster industry's decline in Georgia, market demand for canned oysters also changed.[6] Today, Georgia's marshes have recovered from many of the impacts of overharvesting, enabling the productive growth of oysters and other shellfish. While this is good news, adapting to market changes will be essential if the oyster industry is to revitalize. Tastes have shifted from canned oysters to oysters on the half-shell, and "single oysters" required for half-shell production do not grow naturally in Georgia. Unlike oysters that grow in subtidal environments such as in the Chesapeake Bay, Delaware Bay, or off of the Gulf Coast, Georgia oyster beds are found in the intertidal zone, which is the area between the local high tide and low tide marks, where they grow in muddy clumps with brittle shells having sharp edges.[7] While clumped oysters work well for oyster roasts and canning, the high-end restaurant market demands single oysters to sell on the half-shell.

Fortunately, marine aquaculture techniques – "mariculture" or "oyster farming" – can allow single oysters to be grown in Georgia. Aquaculture techniques suitable for Georgia's environment require "off-bottom" gear that allows the oysters to be grown and held above the sea bottom. Such gear often involves mesh containers such as baskets, cages, or bags that float, are suspended in the water column, or rest "off bottom." Using these techniques provides protection from predators, inhibits the oysters from becoming buried in sediment, and improves growth rates due to increased availability of food.[8] Single oysters with thicker shells suitable for the half-shell market can be grown successfully using such oyster farming techniques.

This case study provides a brief overview of Georgia's regulatory framework relating to the commercial harvesting of shellfish in order to provide the context for the opportunities and challenges facing the state as it works to grow Georgia oyster aquaculture. The case study focuses on some of the key challenges and opportunities facing stakeholders and policymakers, concluding with possible ways to promote best practices and economic development of the oyster industry.

5. Nat'l Oceanic and Atmospheric Admin., NMFS Landing Query, Georgia 2017.
6. Landers, *supra* note 2.
7. This occurs because of high natural recruitment rates and competition for habitat. Shumaway, *Shellfish Aquaculture and the Environment* (2011).
8. *Off-Bottom Oyster Farming*, Alabama Cooperative Extension System.

Harvesting and Selling Oysters in Georgia: The Permitting Framework

Like other states around the nation, the Georgia General Assembly has enacted laws prescribing how, when, and where people can harvest shellfish. The Georgia Department of Natural Resources, Coastal Resources Division (CRD), manages oysters in accordance with these laws, designating what waters are appropriate for oyster harvesting and permitting qualified persons to harvest in these waters. The Department of Agriculture manages sanitation requirements related to commercial handling and shipping of shellfish.

Several requirements must be met for a person to harvest oysters for commercial purposes in Georgia: 1) the harvesting must occur in "approved shellfish waters"; 2) the harvester must receive certification from the Department of Agriculture to handle shellfish; 3) the harvester must have a right to the oysters in the oyster beds, usually in the form of a public or private lease; 4) the harvester must obtain a Master Collecting permit from CRD; and 5) the harvester must have a series of licenses and certifications related to operating vessels and selling shellfish.

1. Must Be Approved Shellfish Waters

The tidewater in which the person wants to harvest must qualify as "approved shellfish waters."[9] For public health reasons, shellfish waters must meet the requirements of the National Shellfish Sanitation Program (NSSP) before they are designated as approved.[10] The NSSP operates as a national and state cooperative aimed at ensuring "the safety of shellfish for human consumption by preventing harvest from contaminated growing waters."[11] The NSSP offers guidance through a Model Ordinance in which "states have agreed to enforce the Model Ordinance as the requirements which are minimally necessary for the sanitary control of molluscan shellfish."

9. Ga. Code Ann. §§ 27-4-193(b), 27-4-195(a).
10. Oysters and other shellfish are filter feeders that are susceptible to developing high concentrations of harmful microorganisms when growing in poor water conditions. U.S. Food and Federal Drug Administration, *National Shellfish Sanitation Program: Guide for the Control of Molluscan Shellfish* (2015). High concentrations of harmful microorganisms has been linked to many harmful shellfish-borne infectious diseases. *Id.* Ga. Comp. R. & Regs. 391-3-6-.03(6)(c)(iii)(2) (Current with amendments available through February 14, 2017); *Guide for the Control of Mulluscan Shellfish, 2017 Revision*, U.S. Food & Drug Administration.
11. *Id.*

At the state level, Georgia has largely adopted the provisions detailed in the Model Ordinance.[12] These requirements encompass two primary areas: the water quality in which the oysters grow and the manner in which they are handled and shipped. In Georgia, the CRD is responsible for water quality requirements. The Department of Agriculture's Seafood Safety Office is the primary authority regarding sanitation of shellfish in handling and transportation.

Water Quality Requirements

To prevent the harms created by shellfish growing in unclean water, the NSSP Model Ordinance requires that states conduct sanitary surveys monitoring the quality of water in growing areas.[13] In Georgia, based on the results of the sanitary survey, growing areas are classified as either "approved" or "prohibited."[14] CRD is responsible for completing these sanitation surveys and classifying growing areas.[15] In total, CRD monitors the water quality for fecal coliform bacteria in 82 stations that encompass both recreational and commercial lease areas within growing areas.[16] After classifying a growing area, CRD has the authority to enforce this determination as Georgia

12. GA. CODE ANN. § 27-4-197 (providing that both the Department of Agriculture ("DOA") and the Department of Natural Resources ("DNR") are responsible for implementing Georgia's Shellfish Sanitation Program in a way that is "sufficient to be certified by the United States Food and Drug Administration).
13. *Id*. A sanitation survey includes: "(1) identification and evaluation of the pollution sources that may affect the areas, (2) an evaluation of the meteorological factors, (3) an evaluation of hydrographic factors that may affect distribution of pollutants throughout the area, and (4) an assessment of water quality." *Id.*
14. Each of the classifications have different implications for harvesters attempting to use the growing area. An area is given an approved classification when the area is free from "unacceptable concentrations" of harmful substances. These areas are also considered open to harvesting, unless an emergency situation, like a hurricane, causes a temporary closing of the area. Oysters or other shellfish taken from these areas may be sold directly without any other requirements. Conversely, an area is classified as restricted when there is an indication of a "limited degree of pollution" in the water quality. This classification is often placed on areas that are subject to fluctuations in water pollution. With the fluctuations in pollution, oysters or shellfish taken from these areas are often required to go through additional treatment before being deemed safe for human consumption. This category requires additional monitoring by the state to ensure that the harmful effects from these areas are avoided. In between these categories, conditionally approved and conditionally restricted areas are optional classifications available to the state. These options exist to classify areas that are subject to "intermittent microbiological pollution." These classifications offer a more flexible approach for the state to restrict access to areas without creating a year-round overly burdensome classification. Finally, the last area of classification is the prohibited areas. These areas are considered closed to harvesting. Growing areas can be classified as prohibited in three ways. First, an area can be prohibited if the sanitary survey produced results that found excessive concentrations of harmful substances in the water. Secondly, a growing area is classified as prohibited if the state fails to adequately update survey requirements on a timely basis. Without updated information, the presumption is that the area is prohibited and closed until further surveys are completed. A third type of prohibited growing area is actually mandated by the ordinance. The ordinance mandates that an area between a sewage treatment plant or other waste discharge of public health significance and a growing area should be labeled as a prohibited area.
15. GA. CODE ANN. § 27-4-195 (providing that "[i]t shall be unlawful to take shellfish from any of the salt waters of this state except at such times and places as the commissioner [of DNR] may establish" and that "the commissioner is authorized to open or close [any area] for the purpose of taking shellfish at any time…"); GA. COMP. R. & REGS. 391-3-6-.03.
16. GA. DEP'T OF NATURAL RES. DIV., *Shellfish Water Quality and Monitoring*.

law makes it "unlawful for any person to take or possess shellfish from unauthorized locations and during unauthorized periods of taking."[17] Violations constitute a "misdemeanor of a high and aggravated nature."[18] Additionally, CRD, as discussed in more detail below, has the authority to deny Master Collecting or Picker's permits to anyone convicted three times or more within two years of applying for a permit.

2. Must Have Certification from the Department of Agriculture to Handle Shellfish

The Model Ordinance also provides a variety of specific regulations regarding the shipping and handling of shellfish that are directly relevant to sanitation concerns. These regulations are aimed at preventing the contamination that occurs "during activities involved in harvesting, processing, distribution, or shipping" of shellfish. While the document provides too many very detailed provisions to adequately describe here, important provisions include detailed guidance for the proper use of storage bins and the temperature at which shellfish can be transported; sanitation certification requirements for dealers; and sanitation requirements for each stage in the process of preparing shellfish for sale, including detailed instructions for maintaining sanitation during shucking and packing, repacking of shucked shellfish, shellstock shipping, reshipping, and depuration. In Georgia, the Department of Agriculture is the primary authority regarding sanitation of shellfish in transportation, processing, and handling.[19]

Certification from the Department of Agriculture is required to "ship or possess commercial quantities of shellfish."[20] Certification requirements are developed according to NSSP guidelines. Specifically, certification is required for "every person who operates a plant where shellfish are handled, stored, shucked, packed, repacked, shipped, reshipped and/or sold in any manner…."[21] The regulation does not apply to the preparation and/or sale of shellfish in kitchens or restaurants.

17. GA. CODE ANN. § 27-4-190.
18. *Id.* § 27-4-201.
19. *Id.* § 27-4-190; GA. COMP. R. & REGS. 40-7-12-.02 (providing the Department of Agriculture the authority to grant Georgia Shellfish Sanitation Certificates, which is given to a "person who operates a plant where shellfish are handled, stored, shucked, packed, repacked, shipped, reshipped and/or sold in any manner shall possess an unrevoked certificate of satisfactory compliance"); GA. COMP. R. & REGS. 40-7-12-.18 (authority to inspect and then revoke permits for violations of compliance with sanitation requirements); GA. CODE ANN. § 27-4-197 (providing the Department of Agriculture with the express powers to regulate satiation quality used in processing and shipping shellfish); GA. CODE ANN. § 27-4-197 (providing the Department of Agriculture with powers to promote shellfish sanitation); GA. COMP. R. & REGS. 40.7.12.19 (adopting the NSSP model ordinance).
20. GA. CODE ANN. § 27-4-197.
21. GA. COMP. R. & REGS. 40-7-12-.02.

3. Must Have Right to Oysters in Water Beds

In order to harvest shellfish for commercial purposes, a person must have the right to harvest the oysters in the water beds and be able to validate this right. Rights to the oysters in Georgia's beds either belong to the state or are private property. An oyster harvester may acquire these rights through land ownership or through a lease.

Rights to Harvest Oysters: Land Ownership

Under Georgia law, ownership of exclusive rights to harvest is based the location of the oyster in relation to:

- the relevant water's status as "navigable," and
- the high and low water tide lines.

Presently Georgia's oyster industry is focused on harvesting oysters in the intertidal areas, also known as the foreshore. However, there is great interest in oyster aquaculture practices that would take place in deeper water below the low tide line, and thus ownership of both the foreshore and consistently inundated areas below the low tide line are relevant.[22]

In Georgia, a navigable water is one that "is capable of transporting at mean low tide boats loaded with freight in the regular course of trade."[23] Importantly, this definition is more limited than the federal definition promulgated by the U.S. Army Corps of Engineers, which includes wetlands as well as waters traditionally understood as navigable.[24] For the purposes of oyster rights in Georgia, there are two types of navigable waters to consider: navigable tidewaters and navigable streams. In *navigable tidewaters*, the State owns the water bottoms and the foreshore up to the high water mark.[25] Private land owners own the uplands above the high water mark. For *coastal navigable streams*, the State owns the title to the land and the water bottoms up to the low water mark.[26]

22. State ownership of the water bottoms is premised on a common law legal premise known as the public trust doctrine, which essentially means that the state owns title to the lands to be held in trust for the public good. In situations where an adjacent property can show a chain of title stretching back to a grant from the English monarch prior to the creation of the state, often called a "kings grant" or a "crown grant," they can claim title to the water bottoms discussed here and the oysters growing from them.
23. GA. CODE ANN. §§ 44-8-5(a) and 44-8-7(a).
24. *See* 33 C.F.R. § 329.4 ("Navigable waters of the United States are those waters subject to the ebb and flow of the tide shoreward to the mean high water mark and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. A determination of navigability, once made, applies laterally over the entire surface of the waterbody, and is not extinguished by later actions or events which impede or destroy navigable capacity.")
25. *See* Johnson v. State, 114 Ga. 790 (1902)
26. GA. CODE ANN. § 44-8-5(b)

Private landowners own the uplands down to the low water mark. When the waters are "non-navigable," the State does not have ownership rights. Private landowners own "non-navigable" water bottoms in Georgia. They also own the rights to harvest oysters in these areas.

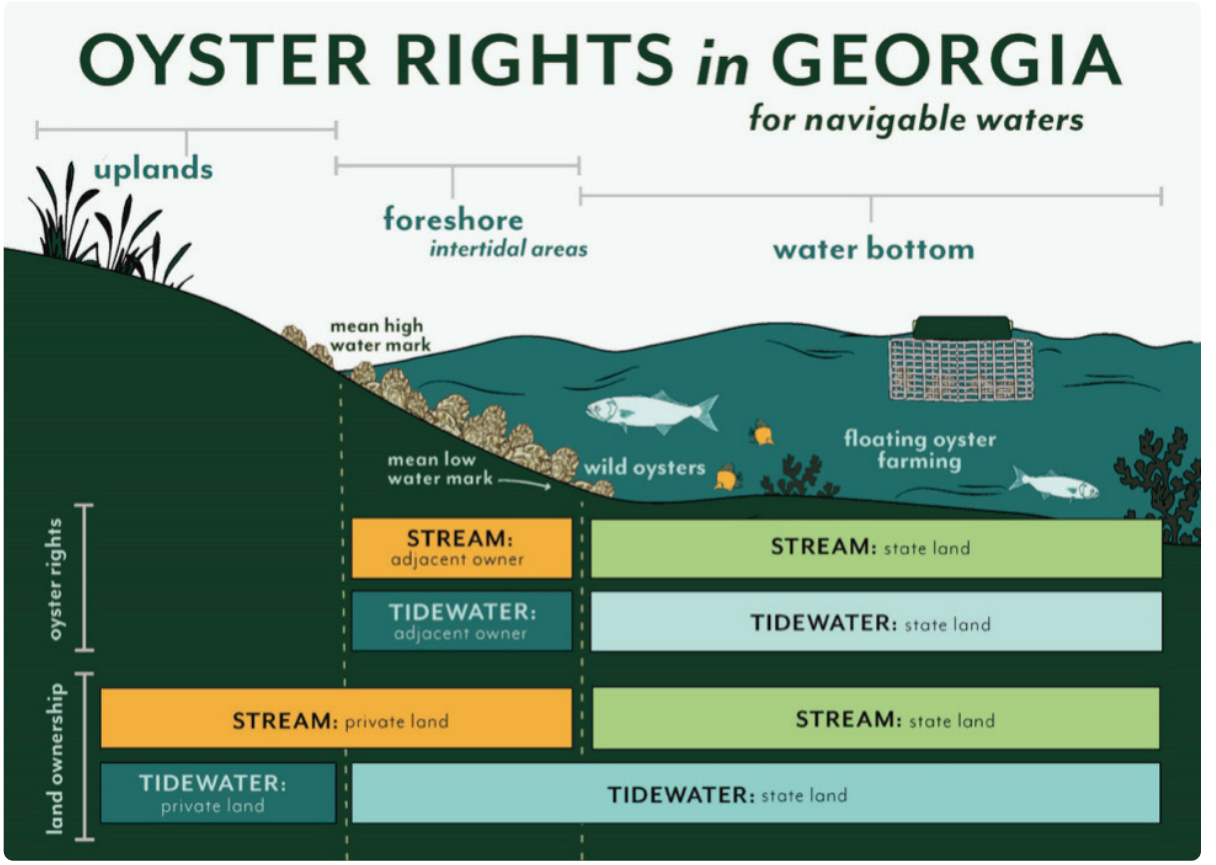

Figure 1: Oyster Rights in Georgia

Under common law, property owners adjacent to navigable tidewaters and navigable streams would not have rights to harvest oysters beyond their tidal boundaries – these rights would belong to the State. In 1902, however, the Georgia General Assembly conveyed to private property owners adjacent to navigable waters the exclusive right to harvest oysters, clams, and other shellfish to the low-water mark.[27] In *State v. Ashmore*, the Supreme Court of Georgia explained that the intention of the boundary was to promote the oyster industry, specifically the planting and cultivation of oysters and clams, and the exclusive right to harvest those crops as well as oysters and clams growing there naturally.[28] As such, in Georgia, rights to the oysters found in the foreshore beds are owned by the adjacent upland property owner.[29]

27. State v. Ashmore, 236 Ga. 401, 409–10 (1976).
28. *Id.* at 412. Again, the exclusive right is for recreational purposes. Commercial activity would still require a Master Collecting Permit.
29. GA. CODE ANN. § 44-8-7(b).

While all of this sounds complicated, the bottom line is that, in navigable waters, the private property owner owns the right to the oysters down to the low water mark. The State owns the right to the oysters beyond this point. Property owners adjacent to oyster beds in nonnavigable waters own both the water bottoms and have exclusive rights to oysters and other shellfish located in these waters.

Type of Water	State Land Ownership	Private Land Ownership	Foreshore Oyster Rights	Waterbottom Oyster Rights
Navigable Tidewater	Water bottoms up to the high water mark.	Uplands above the high water mark.	Belong to the adjacent owner.	Belong to the state.
Nonnavigable Tidewater	None	All of the upland sand waterbottoms.	Belong to the adjacent owner.	Belong to the adjacent owner.
Navigable Stream	Water bottoms up to the low water mark.	Uplands down to the high water mark.	Belong to the adjacent owner.	Belong to the state.
Nonnavigable Stream	None	All of the upland sand waterbottoms.	Belong to the adjacent owner.	Belong to the adjacent owner.

Rights to Harvest Oysters: Private and State Leases

A commercial oyster harvester must either own land to have sufficient rights in adjacent waters to harvest them or they can acquire rights to oysters through a private lease (acquired from a private landowner) or a state lease (acquired from CRD).[30] Notably, in oyster aquaculture context, it is helpful to understand different factors may make one lease preferable over the other. For example, it is possible that growers may choose to farm oysters in non-navigable waters to avoid having to acquire an additional permit from the U.S. Army Corps of Engineers, which would be required if they farmed in navigable waters.[31] On the other hand, some growers may see benefits to farming in navigable waters because of easier access to gear or other reasons.

30. *Georgia Shellfish Aquaculture*, Univ. of Ga. There is no statutory leasing process for a lease to privately owned land; however, a signed and notarized copy of the lease is required if the leaseholder seeks a Master Collector's permit. Such leases are filed with the superior court in the county or county were the lease is located. Private lessees with Master Collector permit must comply with permit requirements under Georgia law. Failure to do so is a violation of the law, and will result in the revocation of the Master Collector's permit and will prevent the permittee from obtaining a permit the following season. *See* Ga. Code Ann. §§ 27-4-190(a)(1); 27-4-190(c); and 27-4-196; *Ga. Shellfish Aquaculture*, Univ. of Ga.
31. *Decision Document Nationwide Permit 48*, U.S. Army Corps of Engineers.

State and Private Leases: Approximate Breakdown of Lease Areas in Acres[32]

Lease Type	Leased Acres	Available Acres	Total
Private	18,800	0	18,800
State	4,160	4,040	8,200
Combined	22,960	4,040	27,000

This section focuses on the process for state leases as they represent acreage in Georgia that is still available for commercial harvesting. A state lease is a lease of any state shellfish bed, which includes all shellfish beds in navigable tidewaters except for those in the "foreshore" adjacent to a private landowner. Any person hoping to obtain a state lease must apply in writing to CRD or participate in a bidding process for a lease that has been approved by CRD.[33] The application must include the name and legal residence of the applicant, a NOAA chart indicating the area desired to be leased, the names and addresses of adjacent landowners as recorded on county tax maps and verification of such information in such form as the CRD may prescribe, the proposed plans for managing the resources, and such other information as the CRD may prescribe.

After receiving the application CRD will ascertain the general nature, character, surroundings, and resource value of the area the applicant is seeking to lease.[34] If CRD determines that the area is suitable for leasing and such a lease would be in the best interests of the state, it offers the lease through public competitive bidding process. To bid on the lease, bidders must submit to CRD sealed bids that are accompanied by a refundable certified check, cashier's check, or money order for the total annual amount of the submitted bid, which will be applied towards the lease if the bidder wins. Additionally, each sealed bid must be accompanied by a detailed management plan for working the shellfish beds.[35]

32. Prepared in consultation with Thomas Bliss, Marine Extension and Georgia Sea Grant.
33. Ga. Code Ann. § 27-4-198(a).
34. *Id.* § 27-4-198(b).
35. *Id.* The CRD publishes once per week for two consecutive weeks in the legal organ of the county or counties where the lease is located an advertisement of an invitation to bid. The CRD publishes once per week for two consecutive weeks in the legal organ of the county or counties where the lease is located an advertisement of an invitation to bid. The advertisement must contain relative information about the area being leased and the specifics of the bidding process. Prior to advertisement, the CRD prepares a proposed form of lease and appropriate instructions, which are available to prospective bidders under conditions prescribed by CRD. The lease form contains provisions regarding the term of the lease, the method of taking oysters, the time and place for payment for the lease, the minimum replanting or management requirements of oysters to be harvested, the placement and type of signs to mark the site as a leased area, and any other terms that CRD deems necessary.

CRD opens all bids for state leases to the public, and the agency may choose the bid and bidder it considers most advantageous to the state.[36] Under the law, CRD is granted considerable discretion when choosing which bid and bidder is most advantageous. According to CRD, "[i]ssuance of a lease depends on the availability of permitted areas, the experience and knowledge of shellfish aquaculture demonstrated by the applicant and the merits of the applicant's shellfish management plan."[37] Additionally, CRD has "the right to reject any or all bids and bidders and the right to waiver formalities in bidding."[38] The agency, however, *must* give preference to residents over nonresidents who have submitted equal bids.[39] If the lease is approved, a copy of the lease *and* a Master Collecting permit will be issued to the winning bidder authorizing the harvest of shellfish.[40]

The lessee must post at the site a sign that clearly identifies the areas leased pursuant to Georgia law.[41] The lessee must have a copy of the lease recorded within 30 days of the execution of the lease by the clerk of the superior court of the county or counties in which the leased area is located.[42]

Any Master Collector or Picker taking oysters from beds leased from the state must return to the oyster beds the shells taken from such beds in such amounts as are specified in the lease agreement.[43] Failure to do so will result in the revocation of the Master Collecting permit and will prevent the permittee from obtaining a permit the following season.[44] Additionally, leases may be terminated if the Master Collector fails to maintain his on-site storage and processing facilities, fails to adequately supervise his pickers, or fails to maintain his shellfish lease area as required by state law."[45]

36. Ga. Code Ann. § 27-4-198(c).
37. *Commercial Shellfish Harvest*, Ga. Dep't of Natural Res. Div., Coastal Res. Div.
38. Ga. Code Ann. § 27-4-198(c).
39. *Id.*
40. *Georgia Shellfish Aquaculture*, Univ. of Ga.
41. Ga. Code Ann. § 27-4-198(d).
42. *Id.*
43. *Id.* § 27-4-196(c).
44. *Id.* § 27-4-190(a), (c).
45. *Commercial Shellfish Harvest*, Ga. Dep't of Natural Res. Div., Coastal Res. Div.

Who	Type of Ownership and Rights	Harvesting for Commercial Purposes
State of Georgia	The State has fee simple title to the foreshore and beds of navigable tidewaters.[46] The State possesses the exclusive right to oysters, clams, and other shellfish unless landowners are adjacent to nonnavigable or navigable waters	Persons wishing to harvest shellfish must acquire a state lease and a Master Collecting permit.
Owner of land adjacent to navigable tidewaters -- "Ashmore Owners."	The State has fee simple title to the foreshore and beds of navigable tidewaters.[47]	Owner possesses the exclusive right to shellfish to the low-water mark of the bed of the water, according to *State v. Ashmore*.[48] Owner does not need a state lease but must acquire a Master Collecting Permit. Non-owners wishing to harvest these shellfish must acquire a private lease from the owner and a Master Collecting Permit.
Owner of land adjacent to nonnavigable tidewaters.	The owner has fee simple title to the nonnavigable waters.	The owner has the exclusive right to the shellfish in the nonnavigable tidewaters.[49] Owners do not need a state lease but must acquire a Master Collecting permit. Non-owners wishing to harvest these shellfish must acquire a private lease from the owner and a Master Collecting permit.[50]

46. State v. Ashmore, 236 Ga. at 413. Navigable tidewater is defined by statute as "any tidewater, the sea or any inlet thereof, or any other bed of water where the tide regularly ebbs and flows which is in fact used for the purposes of navigation or is capable of transporting at mean low tide boats loaded with freight in the regular course of trade." GA. CODE ANN. § 44-8-7(a).
47. *Id.*
48. *Id.*
49. *Id.* § 44-8-6. If the water is the dividing line between two parcels of land, each owner's boundary (and rights) extends to the main thread of channel of the water. This right can be conveyed to holders of leases from such persons.
50. *Id.* § 27-4-190(a)(1).

4. Must Obtain Master Collecting Permit

A person seeking to harvest shellfish for commercial purposes must qualify for and obtain a Master Collecting permit from CRD, which authorizes the harvest and specifies its terms.[51] As noted above, a person must be certified to handle shellfish by the Department of Agriculture before receiving a Master Collecting permit.[52] Under some readings of the statute, if a person has sought and received permission from CRD to engage in oyster aquaculture or "mariculture," a certification to handle shellfish from the Department of Agriculture may not be required in order to acquire a Master Collecting permit. Certification, however, is always required to sell farmed oysters commercially.[53]

CRD issues Master Collecting permits at no charge to the applicant. CRD only issues Master Collecting Permits to individuals or companies who have the exclusive right to harvest oysters from a particular area. Again, an individual or company can have such a right by holding title to the tidewater bed, by possessing the exclusive rights to the oysters in a tidewater bed, or by holding a lease from a person who has such rights. If the permittee's right to harvest oysters is terminated, e.g., the lease is revoked, the permit is void.[54] CRD issues permits annually.[55]

A Master Collector's right to harvest oysters is limited. A Master Collecting permit only allows the taking or possessing of oysters from authorized locations and during authorized periods time. In Georgia, permittees can only take oysters between the hours of one-half hour before sunrise and one-half hour after sunset.[56] Regarding location, permittees cannot take any quantity of oysters for commercial purpose from public recreation harvest areas.[57] Additionally, and as discussed above, permittees are limited to harvesting in areas where they have the exclusive right to harvest, and that have been approved by CRD.[58]

51. *Id.* § 27-4-190(a)(1).
52. *Id.* § 27-4-190.
53. Specifically, Georgia law provides that the "department may issue permission to uncertified firms to take and possess shellfish for mariculture purposes. Such permission may be issued upon such conditions as the department determines are in accordance with current, sound principles of wildlife research and management." *Id.* § 27-4-197.
54. *Id.* § 27-4-190.
55. *Id.*
56. Ga. Code Ann. § 27-4-190(b).
57. Ga. Code Ann. § 27-4-190(d).
58. Ga. Code Ann. § 27-4-190(a)(1).

Furthermore, Georgia law limits what equipment Master Collectors can use to harvest oysters. Without CRD's authorization, it is unlawful for a Master Collector to take or possess for commercial purposes oysters from the salt waters of the state except by hand or hand-held implement.[59] CRD can authorize the use of other equipment if it determines that conditions are "in accordance with current, sound principles of wildlife research and management."[60] Other equipment includes, but is not limited to, rock dredges, escalator dredges, hydraulic dredges, mechanical tongs, patent tongs, and any power drawn or driven device.[61] Prior to using other equipment, the Master Collector must obtain written approval from CRD, which the permittee must carry on his person while taking oysters.[62] The Master Collector must always meet the conditions of CRD's authorization.[63]

Any employee of a Master Collector who will harvest oysters from permitted waters must have a Picker's Permit, which authorizes such harvesting.[64] Master Collectors must request Picker's Permits, in writing, from the CRD.[65] CRD will not issue, not reissue, and revoke the Master Collecting and Picker's Permits if the Master Collector's right to harvest oysters is terminated, he or she fails to fulfill his or her conservation-related obligations, or he or she repeatedly violates the laws governing shellfish harvesting.[66]

59. *Id.* § 27-4-192(a).
60. *Id.*
61. *Id.*
62. *Id.*
63. *Id.* Master Collectors also have certain obligations to return oyster shell ("clutch") to the oyster beds harvested, depending on whether the beds are leased from the state or privately. A permittee taking oysters from beds *leased from the state* must return to the beds the shells from such beds in such amounts as are specified in the lease agreement with the state. *Id.* § 27-4-196(c). Master Collectors gathering oysters for commercial purposes from beds other than those leased from the state to do one of the following each year: "(1) distribute upon areas designated by the department at least 33 1/3 percent by volume of oyster shells taken by permittee or taken under authorization by permittee during the immediately preceding harvest season; (2) transplant at least such amount by volume of oysters from unapproved growing areas in accordance with the requirements of th[e] article; or (3) distribute or transplant at least such amount by volume of culch material. *Id.* § 27-4-196(c). If an applicant has violated any of these provisions in the past year, CRD cannot issue Master Collector Permit to the applicant. *Id.* § 27-4-196(a)(2)("'Clutch material' means that material which is approved by the department and which is conducive to larval oyster attachment.").
64. *Id.*
65. *Id.*
66. *Id.* §§ 27-4-190(a)(1), (c), 27-4-196(c).

5. Other Permits, Licenses, and Certifications

In addition to the leases and permits discussed above, several certificates and licenses are required to sell and harvest shellfish for commercial purposes in Georgia. In addition to having a Georgia Shellfish Sanitation Certificate, which was noted above, a Georgia Wholesale Fish Dealer License, a Food Sales Establishment License, a Georgia commercial fishing license, and a Georgia Commercial fishing vessel license are required.[67] Pickers must have a commercial fishing license and, if the Picker uses a boat, a valid personal commercial fishing boat license.[68]

Finally, it must be emphasized that the requirements discussed throughout this case study are those that pertain directly to oyster or other shellfish aquaculture. Depending on the location of shellfish, additional state and federal laws may be implicated. For instance, the U.S. Army Corps of Engineers regulates the nation's navigable waters, and thus aquaculture operations that take place below the low water mark in a federally-defined navigable water must receive a permit from the Corps of Engineers.[69] In addition many aquaculture operations will also implicate Georgia's Coastal Marshland Protection Act, which will require an additional level of review from the Georgia DNR.[70]

67. *Commercial Shellfish Harvest*, *supra* note 45; GA. CODE ANN. § 27-4-190(a)(1).
68. GA. CODE ANN. § 27-4-190(a)(1).
69. Section 10 of the Rivers and Harbors Act (33 U.S.C. 403); Section 404 Clean Water Act (33 U.S.C. 1344).
70. GA. CODE ANN. § 12-5-280 et seq. The Coastal Marshland Protection Act regulates areas along tidally influenced waters within 5.6 feet above and below the mean tide line.

Georgia's law and regulations currently reflect in large part an era of wild harvesting of oysters. Georgia has the opportunity to build upon this framework to promote oyster aquaculture, and, indeed, stakeholders have been involved in a public-private partnership to expand Georgia's seafood industry through oyster farming.[71] While these stakeholders have identified a series of goals and action steps to strengthen the foundation of the Georgia shellfish industry, this section focuses on some of the regulatory challenges and opportunities facing stakeholders and policymakers.

1. Standardized Guidance for Oyster Aquaculture

Expanding oyster farming in Georgia will require a framework that takes oyster aquaculture directly into account. Current law and regulations reflect an era when wild harvesting of oysters was the dominant practice. While oyster aquaculture is permitted by statute, the law is vague about what practices are and are not allowed. CRD may allow firms to "take and possess shellfish for mariculture purposes" if such purposes are "in accordance with current, sound principles of wildlife research and management."[72] This provision gives CRD great deference to approve – or not approve – oyster aquaculture activity, but it provides little guidance to oyster farmers about what kind of aquaculture techniques and activities are permissible. Currently, CRD is allowing on a case-by-case basis some aquaculture techniques to be used by some commercial shellfish growers. The uncertainty inherent in a case-by-case process makes taking the economic risk to pursue oyster aquaculture difficult for oyster farmers.

In addition, while CRD has approved techniques that work well for clam growers, techniques that work best for oyster farmers have not been approved. Clams, unlike oysters, grow directly in the sediment, and soft mesh bags or netting is laid directly on the bottom to control predators. Sapelo Sea Farms, for example, has been given permission to use bag "grow out" techniques for clams that lie directly on bottom and have no vertical relief.[73] While such an approach works for clams, it does not work well for oyster farming.

71. Georgia Blueprint, *supra* note 3.
72. GA. CODE ANN. § 27-4-197.
73. This technique allows the shellfish farmer to use "seed" that's grown in a hatchery, which are then planted in mesh bags and deposited on tidewater beds where the shellfish are left to grow for 4-6 months.

In the past, CRD, at their discretion, has allowed shellfish growers to use limited amount of aquaculture gear that is similar in size to crabbing gear by giving permission for growers to hold bags "off bottom" at the height equal to or less than the height of a crab trap in the intertidal area on commercial leases.[74] What this means for the oyster industry is that harvesters have been allowed to collect or grow oysters using oyster aquaculture techniques from the one meter column from the bed, if approved in advance by CRD. Gear must be placed on the bottom of approved leases, and may only go up 24-36 inches from the bottom.[75] Growing oysters "off bottom" requires pulling the cages from the bottom of the tidewater bed to shake the sediment off the oysters at least once every one to two weeks, a process that is extremely labor intensive. Gear that floats on top of the water, or is suspended in the water column, has not yet been approved. Such gear is more conducive to growing single oysters for the half-shell market. It also reduces the amount of labor involved.

Certainly, approving floating gear may raise important and difficult issues for CRD, as floating gear brings the challenges of user conflicts and exclusive use of navigable waterways. The purpose of keeping approvals essentially "off bottom" is likely to protect against interference with navigation, avoid having to address vandalism or theft, and/or preserve viewsheds. These are critical concerns. A possible next step may be to develop a set of best practices from neighboring states that have enacted regulations allowing more options for oyster growers while balancing other crucial interests. South Carolina, for example, has developed a permitting process specific to commercial mariculture operations.[76] Under these regulations, the grower may specify the gear they wish to use, although there appears to be different levels of likelihood of obtaining a permit for different types of gear used and some issues appear to have arisen as a result.[77] In addition, those seeking to utilize floating cages must qualify for a permit from the U.S. Army Corps of Engineers. South Carolina and the Corps of Engineers have created a Joint Shellfish Mariculture Application to facilitate this process.[78] North Carolina and Florida also have

74. *See* Email from Thomas Bliss, Director of the University of Georgia's Marine Extension Shellfish Research Lab (Dec. 4, 2017 4:02 PM).
75. Kelly Simmons, *Hatching a Solution: Engineering Students Help Georgia Oyster Farmers*, UNIVERSITY OF GEORGIA, COLLEGE OF ENGINEERING.
76. S.C. CODE ANN. § 50-5-900.
77. *See* S.C. DEP'T OF HEALTH AND ENVTL. CONTROL REGULATION § 61-47.O.6 ("Operators of shellfish mariculture permit areas permitted by South Carolina Department of Natural resources shall provide the Department with a written operational plan that shall include … (c) the types and locations of any structures, including rafts, pens, cages, nets, tanks, ponds, or floats utilized in the aquaculture operation."). *See* S.C. DEP'T OF NATURAL RES., *Checklist for Prospective Mariculture Permittees*.
78. *See* S.C. DEP'T OF NATURAL RES., OFFICE OF COASTAL RES. MGMT. AND U.S. ARMY CORPS OF ENG'R., *Joint Shellfish Mariculture Application for South Carolina*.

developed permitting programs for commercial shellfish aquaculture. Understanding what has and has not worked in these states could inform any future development of a standardized shellfish aquaculture process for Georgia. "Buffer" regions to preserve viewsheds may be warranted, for example. Education and outreach with property owners would almost certainly be needed. In addition, given that CRD would be given additional responsibilities if such a process was developed, an analysis of the staff expertise and costs required to manage aquaculture permitting, costs related to managing and protecting the aquaculture operations, and appropriate permit fees should also be considered.

2. Leases: Streamlining the Process and Expanding Opportunities

Utilizing standardized lease requirements and expanding lease opportunities and acreage also may be another way for Georgia to streamline its process and support the development of oyster aquaculture. In Georgia, a standard lease advertisement and a standard water bottoms contract for all successful bidders are utilized, although there is nevertheless some confusion by some growers who find the process time-consuming. A possible next step may be to develop a set of best practices from neighboring states regarding their approach to the lease process.

In addition, because wild harvesting has been the focus in Georgia, leasing opportunities are limited in at least two different ways. First, Georgia does not have a water column lease option. For example, in addition to providing bottom leases, North Carolina also offers water column leases to allow for oyster aquaculture gear such as floating gear, racks and cages.[79] Applicants for water column leases must either possess a bottom lease already or submit an application for a bottom and water column lease at the same time.

Second, the acreage size of leases in Georgia are not adapted to farming oysters. Oyster aquaculture requires much smaller areas than wild harvesting. Currently, lease areas in Georgia are large, ranging from 170-4,500 acres. Most of these acres are not usable, as they may be broken by salt marshes, tidal creeks and mudflats. Nevertheless, fees are based upon the entire leased area, even if much of it is unusable for oyster aquaculture. Oyster aquaculture, on the other hand, requires much smaller areas because techniques allow for much more efficient cultivation. Again, analyzing how neighboring states have adapted their leases and lease areas to accommodate oyster aquaculture would be a useful first step to understanding what may or may not be possible in Georgia.

79. 15A N.C. Admin. Code 03O.0201; N.C. Gen. Stat. §§ 113-201.1-201.2.

Finally, because crown grants present a barrier to expanding leasing opportunities and acreage in the state, additional research may be needed to assess the extent of the problem and its likely impact on areas suitable for oyster aquaculture. Again, state leases are likely necessary for most oyster aquaculture in Georgia because the state holds the bottom lands of its coastal waters in trust for the public benefit. Due to the fact, however, that the state of Georgia assumed title to these lands from the British Crown, private property owners who can trace their land title back to an original land grant from the King of England can claim private ownership of the water bottoms on their property. These areas – often referred to as "kings grants" or "crown grants" – are then private property (though still subject to navigation on the water over them), and they are not subject to public access or public leasing.[80] This was common law in Georgia for many years until it was codified under O.C.G.A. § 52-1-2, the Protection of Tidewaters Act.[81] Because the existence of crown grants could make determining a property in interest in tidewater difficult to prove, uncertainty often exists about whether the state can approve an area proposed for a state lease. More research is needed to determine the feasibility of identifying crown grants in order to assist the state with identifying areas appropriate for state leases. Ultimately, having a map of areas suitable for leasing would be a tremendous tool for both the state and oyster farmers. North Carolina, South Carolina, and Florida have such maps.[82] Giving growers clear information about which areas are suitable for leasing would improve efficiencies and streamline the current process.[83] Of course, developing such a map requires significant geographic information system (GIS) capacity – both to create the map and maintain it accurately over time.

80. *Id.* ("The State of Georgia continues to hold title to the beds of all tidewaters within the state, except where title in a private party can be traced to a valid Crown or state grant which explicitly conveyed the beds of such tidewaters.").
81. GA. CODE ANN. § 52-1-2 ("The General Assembly finds and declares that the State of Georgia became the owner of the beds of all tidewaters within the jurisdiction of the State of Georgia as successor to the Crown of England and by the common law. The State of Georgia continues to hold title to the beds of all tidewaters within the state, except where title in a private party can be traced to a valid Crown or state grant which explicitly conveyed the beds of such tidewaters."). *See* Black v. Floyd, 280 Ga. 525, 526 (2006) ("... the [S]tate [of Georgia] owns the [tide]water[s] bottoms up to the high water mark," unless, pursuant to OCGA § 52-1-2, a private party can trace his or her title back to an explicit conveyance thereof by a valid Crown or state grant.").
82. *Shellfish Sanitation Maps by County*, N.C. DIV. OF MARINE FISHERIES, http://portal.ncdenr.org/web/mf/shellfish-closure-maps; *State Shellfish Grounds 2018-2019 Season Commercial Harvesting*, S.C. DEP'T OF NATURAL RES., http://dnr.sc.gov/marine/shellfish/pdf/shellfishcommercial.pdf; Shellfish Harvesting Areas, FL. FISH AND WILDLIFE CONSERVATION COMM'N, http://atoll.floridamarine.org/indevelopment/shellfish_pub/.
83. *See Georgia Shellfish Aquaculture*, *supra* note 41. Maryland has an online citing tool that could serve as a model. *See* The Maryland Shellfish Aquaculture Citing Tool.

Conclusion

Great potential exists for Georgia's oyster aquaculture industry. As this brief overview of Georgia's regulatory framework relating to the commercial harvesting of shellfish indicates, however, both opportunities and challenges face the state as it strives to grow Georgia oyster aquaculture. The following next steps may be useful to promote best practices and economic development of the oyster industry.

Standardized Guidance for Oyster Aquaculture

Expanding oyster farming in Georgia will require a framework that takes oyster aquaculture directly into account. Current law and regulations contemplate wild harvesting of oysters primarily, while gear most suitable for growing single oysters has not yet been approved in a standardized way. Uniform guidance to oyster farmers about what kind of aquaculture techniques and activities are permissible is needed in order to produce regulatory and economic certainty. Developing a set of best practices and lessons learned from neighboring states that have enacted regulations or adopted guidance allowing more options for oyster growers while balancing other crucial interests such as navigation, theft, and viewsheds has the potential to productively inform any future development of a standardized shellfish aquaculture process for Georgia.

Leases: Streamlining the Process and Expanding Opportunities

Utilizing standardized lease requirements and expanding lease opportunities and acreage also may be another way for Georgia to streamline its process and support the development of oyster aquaculture. In addition to providing bottom leases, Georgia could consider also providing water column leases, as is done in North Carolina. Oyster aquaculture requires much smaller areas than wild harvesting, yet lease areas in Georgia are large, ranging from 170-4,500 acres. Analyzing how neighboring states have adapted their leases and lease areas to accommodate oyster aquaculture would be a useful first step to understanding what may or may not be possible in Georgia. Because crown grants could be a barrier to expanding leasing opportunities and acreage in the state, additional research may be needed to assess the extent of the problem and its likely impact on areas suitable for oyster aquaculture. Ultimately, having an online map of areas suitable for leasing would be a tremendous tool for both the state and oyster farmers.

Giving growers clear information about which areas are suitable for leasing would improve efficiencies and streamline the current process.

Understanding the State Resources Needed to Support Oyster Aquaculture Development

While developing oyster aquaculture is an economic development activity likely to benefit the state and its citizens, doing so is likely to increase the State's responsibilities – particularly at the Coastal Resources Division and Department of Agriculture – to manage the oyster fishery and ensure seafood safety as well. An analysis of the staff expertise and costs required to manage aquaculture permitting, costs related to managing and protecting aquaculture operations, and appropriate permit fees should also be considered. It is important to remember that, unlike most commercial fisheries, shellfish commodities are heavily regulated to ensure that a safe product is produced and sold to the public because, in many cases, it is consumed raw. The state agencies involved in shellfish regulation in Georgia are audited annually by the Food and Drug Administration. A successful shellfish industry therefore ultimately hinges on the capacity for it to be properly regulated and that all programs are implemented as required.

Molluscan Shellfish Aquaculture in Federal Waters of the Exclusive Economic Zone (EEZ): Agencies, Industry, and Academia Working Together on Compliance and Permitting Requirements

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Introduction

Approximately 91% of the seafood products sold in the United States are imported, and roughly half of those imports are produced by aquaculture.[5] These seafood imports total 2.45 million metric tons, 89,000-90,500 metric tons of which is comprised of molluscan shellfish (e.g. oysters, mussels, clams, and scallops).[6] These imports have contributed to a significant seafood trade deficit, which ballooned to $14 billion in 2016.[7] Increased domestic aquaculture production has

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6. *See* U.S. Food and Drug Admin., *Aquaculture Data*. *See also* NOAA Fisheries Statistics Division, *Commercial Fisheries Statistics*.
7. Sarah E. Lester, Rebecca R. Gentry, Carrie V. Kappel, Crow White & Steven D. Gaines, *Opinion: Offshore aquaculture in the United States: Untapped potential in need of smart policy*, 115(28) PNAS, July 10, 2018, at 7162. *See also* National Marine Fisheries Service Fisheries Statistics and Economics Division, *NMFS Trade Query*.

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the potential to reduce this reliance on seafood imports, which could result in an estimated additional 50,000 full-time and part-time jobs[8] if United States "offshore" aquaculture production is doubled.[9] Furthermore, it has been suggested by some as a way to reduce the carbon footprint associated with imported seafood.[10]

While the potential for increased domestic molluscan shellfish marine aquaculture production[11] has been the subject of high-level discussion at federal and state levels, it is not without policy challenges. Development of commercial marine aquaculture in federal waters of the Exclusive Economic Zone (EEZ)[12] has been constrained for decades by an unclear regulatory process and

8. The value of an additional 50,000 jobs is specific to marine aquaculture and includes the following activities: "offshore aquaculture, coastal shellfish farming, on-shore production methods, and hatcheries to produce stock for private fish and shellfish farms and for marine enhancement purposes." NAT'L OCEANIC & ATMOSPHERIC ADMIN., OFFSHORE AQUACULTURE IN THE UNITED STATES: ECONOMIC CONSIDERATIONS, IMPLICATIONS & OPPORTUNITIES (Michael Rubino ed., 2008).
9. *Id.*
10. The carbon footprint of any species is inclusive of more than simply the "food miles", or the distance the product traveled from where it was caught to where it will be consumed, it is also dependent on factors such as the method in which it was caught (e.g. long-line vs. purse seine), how it was transported (e.g. by air or by sea), and if the product was preserved by canning or frozen. For this reason, it is necessary to measure a product's carbon footprint using a method such as a life cycle assessment, which shows the net carbon contribution of something from "cradle to grave". Anna K. Farmery, Caleb Gardner, Bridget S. Green, Sarah Jennings & Reg A. Watson, *Domestic or imported? An assessment of carbon footprints and sustainability of seafood consumed in Australia*, 54 ENVIRONMENTAL SCIENCE & POLICY 35 (2015). *See also* Elizabeth M.P. Madin & Peter I. Macreadie, *Incorporating carbon footprints into seafood sustainability certification and eco-labels*, 57 MARINE POLICY 178 (2015).
11. Marine aquaculture refers to the rearing, breeding, and harvesting of aquatic plants and animals in the ocean or on land in tanks or ponds and typically includes production of oysters, clams, mussels, shrimp, salmon, and other marine fish. *See* NOAA FISHERIES, *Understanding Marine Aquaculture*.
12. Lines of legal authority for maritime zones in the United States are based on a mix of domestic and international laws and include the territorial sea (0-12 nautical miles), contiguous zone (12-24 nm), and the EEZ (12-200 nm). In addition, within the territorial sea, coastal states have jurisdiction from either 0-3 or 0-9 nm seaward from the baseline of their coast. Most coastal states have jurisdiction only to 3 nm out, but the jurisdiction of Texas, the west coast of Florida, and Puerto Rico extends out 9 nm. For a map of maritime legal boundaries in the United States, as well as other maritime zone facts, see NOAA Office of Coast Survey, *Maritime Zones of the United States* (last visited Dec. 28, 2018). The difference between the territorial sea and the EEZ is that under international law, a coastal nation has sovereign rights in the EEZ to explore, exploit, conserve, and manage living and nonliving resources and over artificial islands or other structures with economic purpose. *See* Exclusive Economic Zone of the United States of America, Proclamation 5030, 48 Fed. Reg. 10605 (Mar. 14, 1983). Whereas, under international law, jurisdiction of the territorial sea means sovereignty over the air space, water column, seabed, and subsoil of this area, subject to certain rights of innocent passage for foreign vessels and sometimes also for foreign aircraft. This case study focuses only on shellfish aquaculture operations in the parts of the territorial sea under federal jurisdiction and in the EEZ (i.e., 3-200 or 9-200 nm). Shellfish aquaculture operations in coastal waters under state jurisdiction are not included in this case study.

by the technical challenges of operating in an offshore environment.[13] These uncertainties have resulted in limited commercial investment, which federal and state regulatory agencies, academia, and the industry have partnered to address. An additional challenge faced by the aquaculture industry is the potential for user conflict in the growing area, such as competition for space between aquaculture facilities and commercial and recreational fishing,[14] which can arise both during the permitting and operations phases of shellfish aquaculture production. Though a common problem in both state and federal waters, user conflicts are often more pronounced in state waters due to the host of recreational (e.g., SCUBA diving and boating) and commercial uses (e.g., fishing and shipping) that are more prevalent.[15] Despite these challenges, the aquaculture industry continues to explore the option of operating facilities in the federal waters of the EEZ. One example is Catalina Sea Ranch (CSR), a farm based in Southern California, that currently farms mussels in the federal waters of the EEZ.

While CSR has received all necessary permits from the U.S. Army Corps of Engineers (USACE) to construct and operate its farm in federal waters of the EEZ, there are separate National Shellfish Sanitation Program (NSSP) requirements that the company must meet as well, in order to harvest and sell their product for human consumption in interstate commerce. The NSSP is a federal-state cooperative program tasked with ensuring the safety of molluscan shellfish for human consumption. The issues CSR faced while obtaining their regulatory permits and in order to comply with the NSSP are complex and have implications for the future of shellfish aquaculture in federal waters of the EEZ. While this case study will reference CSR as an example, the focus will be on the broader requirements for growing and harvesting molluscan shellfish in federal waters and the potential value in introducing a long-term permitting process for aquaculture in federal waters of the EEZ.

The goal of this case study is to provide background information on the permitting process and to highlight an important aspect of operations – compliance – to shellfish growers and investors

13. For example, aquaculture facilities offshore are more exposed to wind and waves, in addition to the engineering needs to appropriately anchor and operate in an open ocean environment. *See* FAO Technical Workshop, Expanding mariculture farther offshore: Technical, environmental, spatial, and governance challenges (Alessandro Lovatelli, José Aguilar-Manjarrez & Doris Soto eds., 2010).
14. *See, e.g.,* California Sea Grant, *Impediments and Opportunities for Coordinating Use of California's Coastal Ocean: Adding Aquaculture to the Mix*.
15. *See* NOAA Fisheries Greater Atlantic Region, *First federally permitted offshore mussel aquaculture project on east coast soon to get underway*.

considering operating in federal waters of the EEZ. Therefore, it is important to note that this case study is limited in scope to focus on the permitting process and NSSP compliance, and that all information is current as of November 2018. Section I will set the stage for the case study by providing background on CSR and a summary of the current regulatory process to obtain permits to operate a shellfish aquaculture facility in federal waters of the EEZ. Section II will describe the potential for a nationwide permitting process through S. 3138. Section III will provide a description and an analysis of the NSSP. Section IV will describe California's implementation of NSSP requirements, followed by a discussion of the challenge of obtaining NSSP compliance for shellfish grown in federal waters of the EEZ in Section V. Section VI will conclude the case study with an analysis of current NSSP compliance requirements to grow and harvest molluscan shellfish in federal waters of the EEZ and the steps federal and state agencies, as well as growers, have implemented in order to comply with the NSSP.

Section I: Current Permitting Process for Aquaculture in the EEZ

CSR, the first aquaculture facility in federal waters off the West Coast of the United States, is located approximately six miles off Huntington Beach, California. Currently, CSR only farms Mediterranean mussels (*Mytilus galloprovincialis*), however, they are considering farming scallops, oysters, and seaweed (kelp) in the future. Because shellfish are filter feeders, they do not require external feed and are also able to filter a large volume of water each day[16] with one adult mussel able to filter up to 15 gallons of water per day.[17] It is for these reasons that CSR considers molluscan shellfish as ideal crops, since the company's goal is for their aquaculture activities to "show no measurable [environmental] impact on the surrounding ocean."[18]

Given aquaculture production in federal waters of the EEZ is a developing practice in the United States, an overview of the permitting process a shellfish aquaculture business must follow in order to operate in federal waters of the EEZ provides helpful context for the case study.[19]

16. *See* Andrea Bennett, Environmental Protection Agency, *Our Friends the Freshwater Mussels*, EPA Blog (July 17, 2014).
17. For context, in one presentation to the California Water Boards CSR reported that in one year their facility could produce 2 million pounds of mussels, which in turn can filter around 13,607,787,270 gallons of water, or 41,760 acre feet of water which is a little more than a third the amount of water in Lake Tahoe, CA. *See* California State Water Resource Control Board, *Catalina Sea Ranch*.
18. *See* Louisa Burwood Taylor, *Catalina Sea Ranch Raises $2M for Innovative Offshore Aquaculture Project*, Ag Funder News (Jan. 25, 2017).
19. Kelly B. Boden & Karen A. Mignone, *The aquaculture permitting process in federal waters*, Trends May/June 2014, ABA Section of Environment, Energy and Resources.

The current federal permitting requirements are outlined below, using CSR as an example. For CSR, the two major federal laws that apply to shellfish aquaculture facilities in federal waters of the EEZ off California's coast are the Rivers and Harbors Act (RHA) and the Clean Water Act (CWA), with the U.S. Army Corps of Engineers (USACE) acting as the main permitting authority for the placement and construction of the farm.

Rivers and Harbors Act (RHA)

In order to construct a commercial shellfish aquaculture facility in state or federal waters, it is highly likely the operator will need a Section 10 Rivers and Harbors Act (RHA) permit from the USACE, which CSR did through the USACE's Los Angeles District.[20] The USACE's authority to regulate obstructions to "the navigable capacity of any of the waters of the United States" originates under the RHA.[21] Under the RHA, a Section 10 permit is needed for any "construction of structures in, over, or under, excavating from or depositing material into, and any other work affecting the course location, condition, or capacity of navigable waters."[22] Permits under the RHA are issued, issued with special conditions, or denied.

Before the USACE grants a Section 10 permit, the agency must consider the effects that the activity will have under other federal laws, listed under regulation 33 C.F.R. 320.3. These laws include any applicable treaty rights, Section 106 of the National Historic Preservation Act,[23] Marine Mammal Protection Act,[24] and Section 304(d) of the National Marine Sanctuaries Act.[25] In addition, the USACE must consult with NOAA Fisheries (also known as the National Marine Fisheries Service, or NMFS) to determine compliance, as necessary under 33 C.F.R. 320.3, with endangered species regulations under the Endangered Species Act (ESA) and essential fish habitat regulations under the Magnuson-Stevens Fishery Conservation and Management Act.[26]

The USACE, in consultation with NOAA Fisheries, in 2012 issued a Section 10 permit to CSR conditioned upon the "completion of review of the permit for consistency with state law"

20. Read Porter & Rebecca Kihslinger, Environmental Law Institute, U.S. Army Corps of Engineers Regulation of Offshore Aquaculture (2015).
21. *See* 33 U.S.C. § 403.
22. *See* 33 C.F.R. § 322.
23. *See* 16 U.S.C. § 470f.
24. *See* 16 U.S.C. § 1361 et seq.
25. *See* 16 U.S.C. § 1434.
26. *See* Boden & Mignone, *supra* note 19.

pursuant to the Coastal Zone Management Act (CZMA).[27] Under the consistency provision of the CZMA,[28] coastal and Great Lakes states may review the USACE's decision to grant a Section 10 permit if the project will have reasonably foreseeable effects on any coastal land or water use or natural resource in that state's coastal zone. If a state denies CZMA consistency, then the federal permit applicant may appeal the denial to the Secretary of Commerce or choose to either withdraw its permit application or submit a new permit application with changes. The major policy goal of the CZMA, which is administered by NOAA, is to help achieve a balance between the wise use of land and water resources in the nation's coastal zone and compatible economic development.[29] This policy goal is achieved in part through: (1) funding assistance[30] and technical assistance[31] provided by NOAA to coastal and Great Lakes states;[32] and (2) the act's federal consistency provision.[33]

During the Section 10 permitting process for CSR's facility, the California Coastal Commission (CCC) received authorization from NOAA's Office for Coastal Management (OCM) to ensure that CSR's proposed plan was consistent with the enforceable policies of California's Coastal Management Program (CMP). After an independent review by the CCC and a public comment period, the CCC concurred with the Section 10 permit subject to 13 conditions, such as environmental impact monitoring during and after the construction process (see Figure 1 for a complete list of the conditions).[34] While at first glance these conditions may seem to be simple requests, closer examination reveals some conditions to be resource-intensive. For example, condition number one calls for CSR to establish an adaptively managed "offshore mariculture monitoring program" which is comprised of 14 provisions, including information such as the methodology used for analysis and reporting of results, and records of the type and amount of commercial and recreational fishing that occurs around the facility.[35]

27. *See* Porter & Kihslinger, *supra* note 20.
28. *See* 50 C.F.R. § 930.
29. *See* 16 U.S.C. § 1451 et seq.
30. 16 U.S.C. § 1456(a).
31. 16 U.S.C. § 1456(c).
32. Participation in the CZMA is voluntary. Coastal and Great Lakes states are only eligible for this funding and technical assistance if they have a NOAA-approved state coastal management plan. *See* 16 U.S.C. § 1455 and 1456(c).
33. *See* 16 U.S.C. § 1456 ("Each Federal agency activity within or outside the coastal zone that affects any land or water use or natural resource of the coastal zone shall be carried out in a manner which is consistent to the maximum extent practicable with the enforceable policies of approved State management programs.").
34. Porter & Kihslinger, *supra* note 20.
35. California Coastal Commission, Staff Report For Consistency Certification CC-035-12 (2013).

CSR is required to submit annual reports for five years to the Executive Director of the CCC, which must include the following:

- Data from all sampling and monitoring activities;
- Narrative summary of sampling and monitoring activities that were carried out and the techniques, methodologies, and equipment used to support them;
- Analysis of sampling and monitoring results; and
- Discussion of preliminary or final results and conclusions.[36]

If it is determined that CSR is not carrying out their monitoring plan in a way that is consistent with California's Coastal Management Program, then the CCC can re-open the consistency review and either require project modifications or object to the facility's continued operation.[37]

Conditions for Concurrence with Catalina Sea Ranch Permit

1. Offshore mariculture monitoring program
2. Marine wildlife entanglement
3. Lighting and operation at night
4. Construction monitor
5. Notice to mariners
6. Spill prevention and control plan
7. Lost/damaged fishing gear compensation program
8. Update NOAA charts
9. Letter of credit
10. Facility removal
11. Discharge of biological materials
12. Marine debris
13. Invasive species

Figure1: *List of the CCC's conditions for CZMA concurrence for CSR permit*[38]

36. *Id.*
37. *Cal-Span, California Coastal Commission Hearing* at 3:40:00 (Jan. 1, 2014).
38. PORTER & KIHSLINGER, *supra* note 20.

Although CSR questioned the need for all 13 of the CCC's conditions,[39] which are unique to CSR's facility, the company ultimately accepted them, after which the USACE issued the Section 10 permit in 2014.[40] CSR's permit allows the facility to grow mussels to a depth of 150 feet and across 100 acres of water,[41] but the company hopes to expand its operations to 1,000 acres.[42] In addition, CSR consulted with the U.S. Coast Guard (USCG) to select the location and depth of their lines in order to minimize potential space-use conflicts with existing shipping lanes, oil platforms, and oil pipelines.[43] Since receiving their federal permit, CSR has successfully farmed mussels and had their first harvest in July 2018. However, in order to harvest and sell their product for human consumption, CSR also must meet the NSSP requirements, which are explored in more detail in Section III.

Clean Water Act

The Clean Water Act (CWA) gives the federal government the authority to regulate the discharge of dredged or fill material into waters of the United States, if the facility is located in "navigable waters."[44] CWA sections that may apply to shellfish aquaculture operations in federal waters of the EEZ include Section 404 (discharge of dredged or fill material) and Section 401 (water quality certification of discharge of pollutants). Federal jurisdiction under Section 404 is shared between the USACE and the Environmental Protection Agency (EPA). Permits for activities that have the potential to have significant environmental impacts are reviewed by the USACE under a public interest review and 404(b)(1) Guidelines established by the EPA.[45] Since navigable waters or "waters of the United States" extend out to the EEZ,[46] the CWA is likely to apply to a shellfish aquaculture facility located within 200 nautical miles of the coast. In addition, a Section 404 permit may be required under the CWA if the aquaculture facility will discharge dredge or fill material into navigable waters.[47] This permit, which must be renewed five years after the date of issuance, may be required if the aquaculture gear or related activities "substantially disrupts" ocean sediment, resulting in a discharge of dredged material.[48]

39. Telephone Interview with Phil Cruver, Founder and CEO of Catalina Sea Ranch (May 17, 2018).
40. *Id.*
41. Abbie Fentress Swanson, *Growing millions of mussels beneath the Pacific Ocean waves*, KCRW(June 30, 2017).
42. Catalina Sea Ranch, *The Ranch*.
43. Porter & Kihslinger, *supra* note 20.
44. *See* 33 U.S.C. § 1344.
45. *See* 40 C.F.R. § 230 et seq.
46. *See* 33 U.S.C. § 1362(10).
47. *Id.* § 1344(a).
48. *Id.* § 1344(e)(2).

Section 401 requires that any person applying for a federal permit or license for an activity that may result in the discharge of pollutants into waters of the United States apply for a water quality certification that any discharge will comply with all water quality standards.[49] Federal permits or licenses subject to Section 401 include Section 10 and Section 404 permits and potentially could apply to shellfish aquaculture facilities in federal waters of the EEZ, depending on the scope and design of their operations with respect to landing their product. Section 401 authorizes the EPA to delegate water quality certification to the states, since discharge of pollutants typically occurs within the borders of a state. If a water quality certification is required for a shellfish aquaculture facility in federal waters of the EEZ, that certification would come from the state where discharges may occur to ensure the facility operates under water quality standards relevant to that state.

Private Aid to Navigation (PATON) Permit

In order to avoid conflicts with navigation, a shellfish aquaculture facility in federal waters of the EEZ likely will require a U.S. Coast Guard (USCG) Private Aid to Navigation (PATON) permit.[50] Aquaculture activities require a PATON to properly mark hazards to navigation.[51] The purpose of this permit is to assess the safety of the PATON object and determine if the object should be lighted, placed on nautical charts, or both.[52]

Section II: The Potential for a Nationwide Permitting Process

The National Aquaculture Act was passed into law in 1980 and established a national policy to support the development of aquaculture broadly and noted the need to address the regulatory restraints on aquaculture.[53] However, there is still not a comprehensive and nationwide permitting process in place for marine aquaculture in federal waters of the EEZ that also provides for long-term permits to promote regulatory certainty and security of tenure needed for long-term business and investment decisions.

49. *Id.* § 1341.
50. *Id.* § 1221 et seq.
51. *Id.*
52. *Id.*
53. 16 U.S.C. §§ 2801-2810.

In June 2018, S. 3138 – entitled the "Advancing the Quality and Understanding of American Aquaculture Act" – was introduced in the Senate by Senator Roger Wicker to: promote the sustainable development of marine aquaculture in the United States; support research and technology development; and provide new jobs and support existing jobs within the seafood industry (including jobs for the traditional fishing industry).[54] Although the bill in its current form does not address seafood safety or NSSP compliance, if passed into law, the act would designate NOAA as the lead federal agency and charge NOAA with developing a comprehensive permitting process and regulatory procedures for aquaculture operations in the EEZ.

In addition, the bill would authorize NOAA to issue long-term permits (25 years, renewable) for aquaculture in federal waters of the EEZ. This could provide shellfish (and finfish and seaweed) growers with greater security of tenure for projects in the EEZ because federal permits for aquaculture under current law (i.e., Section 10 RHA) are typically much shorter in duration, generally for five years.[55] Since the bill was introduced on June 26, 2018, it has been referred to the Committee on Commerce, Science, and Transportation.

Section III: National Shellfish Sanitation Program

The National Shellfish Sanitation Program (NSSP) was created by the U.S. Food and Drug Administration (FDA) and adopted by the Interstate Shellfish Sanitation Conference (ISSC)[56] to promote a uniform standard of sanitation in the harvesting, transporting, and processing of molluscan shellfish. The NSSP operates as a federal-state cooperative to ensure "the safety of shellfish for human consumption by preventing harvest from contaminated growing waters."[57] This program offers guidance to states through a Model Ordinance, where "states have agreed to enforce… the requirements which are minimally necessary for the sanitary control of molluscan shellfish."[58] The NSSP is a comprehensive program that focuses on an assessment of pollution sources, water quality standards for the classification of growing areas, laboratory requirements, patrol of growing areas, plan processing facilities, and the shipping and handling of molluscan shellfish through the Model Ordinance.

54. AQUAA Act, S. 3138, 115th Cong. (2018).
55. *See* 33 U.S.C. § 1344(e)(2).
56. The ISSC is a cooperative group that includes industry, academic, federal government, and state government representatives that foster and promote the safe harvest of shellfish nationwide. *See* http://www.issc.org/home for more information.
57. National Shellfish Sanitation Program, Guide for the Control of Molluscan Shellfish (2009).
58. *Id.*

Water Quality Standards

Molluscan shellfish are filter feeders, and are susceptible to accumulating high concentrations of harmful pathogens, marine biotoxins, and contaminants in their tissues.[59] These dangerous concentrations have been linked to shellfish-borne infectious diseases that affect humans and also may harm marine species, such as birds, fish, and marine mammals.[60] Some of these naturally occur in the ocean, such as *Vibrio parahaemolyticus* – one of several species of pathogenic bacteria naturally present in many marine ecosystems (collectively known as *Vibrio*) – which causes around 32,000 human illnesses each year in the United States when raw or undercooked shellfish are consumed.[61] Other harmful pathogens, however, do not naturally occur in the ocean. For instance, norovirus particles can accumulate in shellfish found in waters that have been contaminated by sewage, which when harvested and consumed, either when raw or inadequately cooked, can inflict the consumer with symptoms similar to food poisoning or the stomach flu.[62]

To prevent shellfish from being grown in, and harvested from, water that doesn't meet water quality standards, the NSSP Model Ordinance requires that states conduct sanitation surveys.[63] A sanitation survey includes an:

1. Identification and evaluation of the pollution sources that may affect the growing areas;
2. Evaluation of the meteorological factors;
3. Evaluation of hydrographic factors that may affect distribution of pollutants throughout the area; and
4. Assessment of water quality.[64]

59. *Id.*
60. *Id.*
61. Elaine Scallan, Robert M. Hoekstra, Frederick J. Angulo, Robert V. Tauxe, Marc-Alain Widdowson, Sharon L. Roy, Jeffery L. Jones & Patricia M. Griffin, *Foodborne Illness Acquired in the United States--Major Pathogens*, 17(1) Emerg. Infect Dis. 7 (2011).
62. Martha Iwamoto, Tracy Ayers, Barbara E. Mahon & David L. Swerdlow, *Epidemiology of Seafood - Associated Infections in the United States*, 23(2) Clinical Microbiology Reviews 399 (2010).
63. National Shellfish Sanitation Program (2017), *supra* note 57.
64. *Id.*

Based on the results of the sanitary survey, growing areas are classified into one of five different water quality classifications:[65] (1) approved, (2) conditionally approved, (3) restricted, (4) conditionally restricted, or (5) prohibited.[66] Each of the classifications have different implications for harvesters attempting to use the growing area, as it determines how the "shellstock" can be used following the harvest.[67] An area is given an "approved" classification when it is free from "unacceptable concentrations" of harmful substances.[68] These areas are also considered open to harvesting, unless an emergency situation temporarily closes an area.[69] While the water body classification of an area may be "approved", meaning that shellfish may be harvested directly without any depuration, other NSSP Model Ordinance requirements such as biotoxin control and management must still be met before shellfish are harvested.[70]

Conversely, an area is classified as "restricted" when a "limited degree of pollution" is detected in water quality.[71] This classification is often placed on areas that are subject to unpredictable water pollution.[72] With unpredictable pollution, shellfish taken from these areas are often required to go through depuration before being deemed safe for human consumption.[61] This category requires additional monitoring by the state to ensure that the harmful effects from these areas are avoided.[74] In between these categories are "conditionally approved" and "conditionally restricted" areas – optional classifications available to the state which exist to classify areas that are subject to predictable "intermittent microbiological pollution."[75] These classifications offer a more flexible approach for the state to restrict access to areas without creating a year-round overly burdensome classification.[76] While these more flexible designations hold true for facilities located in state waters, those in federal waters are classified as "approved" for shellfish harvesting unless such areas are known to be polluted[77] and involve commercial shellfish resources.[78]

65. *Id.*
66. *Id.*
67. *Id.*
68. *Id.*
69. *Id.*
70. *Id.*
71. *Id.*
72. *Id.*
73. *Id.*
74. *Id.*
75. *Id.*
76. *Id.*
77. This information comes to the FDA from federal agencies and State Shellfish Control Authorities. Telephone Interview with James "Quentin" Forrest, National Shellfish Growing Area Expert, Division of Seafood Safety, U.S. Food and Drug Administration (November 9, 2018).
78. National Shellfish Sanitation Program (2017), *supra* note 57.

The FDA is responsible for both the sanitary survey as well as the classification of growing area in federal waters. The sanitary survey is conducted in accordance with Chapter IV @.01 "as applicable", which provides a mechanism for the FDA to conduct a sanitary survey in accordance with the potential pollution source and health risk which may be a different process then what might be required for state waters.[79] On occasion, federal waters may be classified as "conditionally approved" or "conditionally restricted"; however, this is uncommon.[80]

The last area of classification is for "prohibited" areas.[81] Prohibited areas are closed to harvesting and are classified as such for one or more of these reasons:

1. The sanitary survey findings show excessive concentrations of harmful substances in the water;[82]
2. The state fails to adequately update survey requirements on a timely basis (without updated information, the Model Ordinance requires the area to be classified as prohibited, and is closed until further surveys are completed);[83] or
3. The area is located adjacent to a sewage treatment plant or other waste discharge of public health significance.[84]

Biotoxin Testing

While there is a pathway for NSSP compliance for molluscan shellfish grown in federal waters through ISSC proposal 17-116, an outstanding issue is testing the cultured shellfish for biotoxins. Per NSSP, the FDA will conduct sanitary surveys and classify growing areas in federal waters, while the NOAA Seafood Inspection Program (NOAA SI) will work as agents of the FDA, with the growers, to ensure their facilities meet NSSP requirements. However, it is the responsibility of the growers to develop an operational plan that must include a description of a marine biotoxin management and contingency plan that addresses sampling and product segregation. If a shellfish grower lands their product in a state that does not extend testing to shellfish grown in federal waters of the EEZ, such as California, what options would be available to the grower?

79. *Id.*
80. James "Quentin" Forrest, *supra* note 77.
81. National Shellfish Sanitation Program (2017), *supra* note 57.
82. *Id.*
83. *Id.*
84. *Id.*

In CSR's case, outside of those operated by NOAA SI, the only lab on the West Coast of the United States at the time of this publication that is certified to test for biotoxins is located in Washington State. Outside of the Washington lab, the only other certified testing facility is located in Maine.[85] Due to the cost of sending samples to Washington or Maine for testing, CSR is weighing the option of building its own lab for long-term testing.[86] However, the lab would still need to meet NSSP requirements before it could be used to test CSR's cultured mussels for biotoxins.[87] Other growers considering this are encouraged to work with the FDA and NOAA SI on the requirements for building a testing facility.

Shipping and Handling

The NSSP also establishes specific regulations regarding the shipping and handling of molluscan shellfish. These regulations are aimed at preventing the contamination that occurs during the harvesting, processing, distributing, or shipping of shellfish. While the document provides too many detailed provisions to adequately describe here, some of the more important provisions are described below.

First, the regulations provide specific transportation requirements, including detailed guidance for the proper use of storage bins and the temperature at which shellfish can be transported. In accordance with these provisions, when transported, shellfish should not be kept with any other type of cargo. Second, the NSSP provides detailed sanitation requirements for dealers. A dealer is defined as "a person to whom certification is issued for the activities of shellstock shipper, shucker-packer, re-packer, re-shipper, or depuration processor."[88] The general requirements for dealers include ensuring the cleanliness of surfaces and water that contact shellfish and properly labeling and storing shellfish to prevent any contamination. However, the regulations also provide specific sanitation requirements for each stage in the process of preparing shellfish for sale. These requirements include detailed instructions for maintaining sanitation during shucking and packing, repacking of shucked shellfish, shellstock shipping, reshipping, and depuration. In federal waters, there are only NSSP requirements for the harvester. Once the product is harvested and sold to either a dealer or a shipper in the landing state, the state shellfish control authority is responsible for the relevant NSSP compliance.

85. Phil Cruver, *supra* note 39.
86. *Id.*
87. *Id.*
88. *Id.*

The necessary requirements and protocols to be followed are specific to where the shellstock is coming from as well as where it is going, and how it is getting there. These requirements can be found in "Section III Public Health Reasons and Explanations – Chapters XI., XII., XIII., and XIV. Shellfish Processing and Handling".[89]

Section IV: California's Implementation of the Requirements Under the NSSP

As discussed above, under the NSSP Model Ordinance, each state shellfish control authority is tasked with implementing the minimum requirements set forth in the ordinance for shellfish harvested in state waters and involved in interstate commerce. In California, the state agency in charge of ensuring that minimum requirements under the NSSP are met within state waters is the California Department of Public Health's (CDPH) Shellfish Program, which is managed by the Environmental Management Branch (EMB) and the Food and Drug Branch (FDB) under the Center for Environmental Health.[90] To ensure shellfish sanitation, California distinguishes between pre-harvest and post-harvest duties. While the EMB manages all pre-harvest duties as well as California's Marine Biotoxin Monitoring Program,[91] the FDB ensures the safety of post-harvested molluscan shellfish and the regulation of manufacturers and distributors of seafood products.[92] In the past the CDPH has been able to cover some of the costs associated with preharvest commercial shellfish activities, as well as for classification of commercial growing areas within state waters.[93]

Section V: Obtaining NSSP Compliance for Shellfish Grown in Federal Waters of the EEZ

While CSR is permitted to grow mussels,[94] the company experienced some challenges obtaining NSSP compliance for its product, even though there is a clear pathway outlined involving NOAA SI and the FDA.[95] As noted above, commercial shellfish farms harvest and sell their

89. National Shellfish Sanitation Program (2017), *supra* note 57.

90. *See* California Dep't of Public Health, *Shellfish Program*.

91. *Id.*

92. *Id.*

93. Notably, this cost-sharing mechanism is not a formal policy, and is dependent on the types of testing that need to be done as well as the funding that the CDPH has available. Telephone Interview with Eric Trevena, Chief, Environmental Health Services Section, California Department of Public Health (Sept. 10, 2018).

94. "Federal waters" are defined by the ISSC as "waters that fall outside of State and local jurisdiction but within U.S. sovereignty (typically 3-200 nautical miles offshore). Federal waters include the territorial sea and exclusive economic zone. *See* Interstate Shellfish Sanitation Conference, Task Force I Report (2017).

95. Phil Cruver, *supra* note 39.

product for human consumption through compliance with NSSP requirements.[96] However, this national program is typically implemented at the state agency level rather than by a federal agency – in California's case, by CDPH. As the 2017 NSSP Guide states, "state laws or regulations must provide an adequate legal basis for sanitary control of all phases of handling shellfish."[97]

However, according to Diane Windham, Southwest Regional Aquaculture Coordinator for NOAA Fisheries, state agencies may certify shellfish for sanitation in federal waters, as long as there is a memorandum of understanding between the relevant state shellfish control authorities, the FDA, and NOAA.[98] However, if faced with overburdened and understaffed agencies, a state might decline to take on sanitation of shellfish grown in federal waters of the EEZ. California is one such state that has elected not to test outside state waters at this time. If a state declines to certify product grown in federal waters, the grower should work directly with the FDA and NOAA SI, who will be able to provide additional guidance. Because of this, CSR worked directly with the federal government in order to get their product in compliance with NSSP requirements.

While NOAA SI and the FDA are working directly with CSR, the two agencies are focused on addressing the issue more broadly to provide shellfish growers operating in federal waters of the EEZ with a pathway towards NSSP compliance. The FDA and NOAA SI have entered into a private contract with CSR to perform the required water quality and safety tests to obtain certification. However, there is important context as to why CSR needed to enter into a private contract with FDA and NOAA SI and why a more permanent and broadly applicable solution is needed. Currently, there is no permanent pathway because historically there was not as much interest in shellfish operations in federal waters in the EEZ as there is today. However, due to increasing industry interest in siting facilities offshore, the ISSC understood the need for a federal pathway and established a Federal Waters Committee to propose a protocol.[99]

96. National Shellfish Sanitation Program (2017), *supra* note 57.
97. *Id.*
98. Telephone Interview with Diane Windham, NOAA Southwest Regional Aquaculture Coordinator for NOAA Fisheries (Feb. 5, 2018).
99. The FDA encourages the correct terminology be used when talking about aquaculture in federal waters. Therefore, "protocol" should be used not to represent the already established framework developed by the ISSC, but to represent the requirements that were developed by the FDA and NOAA Seafood Inspection to bring CSR and other federal growers into compliance with sanitation.

The FDA submitted a proposal for compliance with NSSP requirements in federal waters, which was approved in 2017 by the ISSC as a four-year interim program, and established a Federal Waters Committee to evaluate the process and re-visit it at the end of the four-year period.[100] This interim program allows the FDA to conduct sanitary surveys in federal waters, in compliance with Chapter IV @.01 in the Model Ordinance as well as growing area classifications, in compliance with Chapter IV @.03.[101] CSR initially declined the option provided by NOAA SI and the FDA, perhaps due to the burden of costs associated with beginning operations and adhering to California's permitting regulations. CSR originally had hoped to continue to work with the CDPH on an avenue for the agency to test in federal waters (unconfirmed by CDPH); however, they have since decided to utilize the federal pathway which allowed them to have their first harvest on July 30, 2018.[102]

Section VI: Moving Forward

Shellfish aquaculture in the EEZ comes with the technical and logistical challenges that are part and parcel with operating in an offshore environment, but current and prospective marine aquaculturists should be aware of the regulatory and compliance nuances as the U.S. aquaculture industry contemplates further expansion into federal waters of the EEZ. In order for development on a broader scale to occur to meaningfully address our nation's seafood deficit and contribute to the local economies along the coast, the NSSP compliance issue needs a formal resolution because it can prevent harvest. In addition, a federal permitting process that includes long-term authorization of aquaculture activities in the EEZ would provide the regulatory certainty and security of tenure needed for greater investment. CSR is an ideal case study for these issues not because regulations and compliance requirements became roadblocks, but because CSR was able to successfully navigate both processes to construct and operate their facility and harvest their product for sale.

The FDA and NOAA SI continue to work closely with the ISSC to implement the federal compliance pathway interim program (ISSC 17-116). Utilization of the interim program ISSC 17-166 for NSSP compliance in federal waters would provide the FDA, NOAA SI, and the ISSC with important feedback in order to help them move forward with a permanent solution.

100. *See* Interstate Shellfish Sanitation Conference, ISSC Task Force I Proposals, Proposal 17-166.

101. *Id. See also* Interstate Shellfish Sanitation Conference, *supra* note 94.

102. Phil Cruver, *supra* note 41.

For state-level agencies responsible for NSSP compliance in states that currently do not extend biotoxin testing to EEZ waters but want to consider moving in this direction, broader discussions through the ISSC could be hosted with their counterparts in other state agencies and with federal agencies (those which have authority over NSSP compliance). Such discussions could help these agencies identify resources needed to extend testing to shellfish grown in federal waters of the EEZ. For current and prospective shellfish growers interested in ventures in EEZ waters, understanding NSSP requirements in the context of operating in federal waters of the EEZ and how federal agencies and the ISSC are working with industry to meet them is as important as understanding how to navigate the permitting process. Hopefully, this case study has provided information on these requirements so shellfish growers can understand them from the beginning, and that the transition from permitting to construction and operations to harvest can happen smoothly.