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Revising The National Offshore Aquaculture Act Of 2007: Using State Of Maine Aquaculture Laws, Regulations, And Policy Recommendations As A Prototype For The Proposed Framework

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REVISING THE NATIONAL OFFSHORE AQUACULTURE ACT OF 2007: USING STATE OF MAINE AQUACULTURE LAWS, REGULATIONS, AND POLICY RECOMMENDATIONS AS A PROTOTYPE FOR THE PROPOSED FRAMEWORK

Lynne D. Davies[*]

I. INTRODUCTION

Studies in domestic seafood consumption reveal surprising trends, as the United States continues to increase its annual percentage of imported seafood at an exponential rate. For example, during the first seven months of 2006, U.S. catfish imports from Vietnam increased by seventy-one percent over the annual percentage calculated for 2005.[1] Similarly, U.S. imports of Chinese tilapia increased from 57 million pounds in 2001 to 163.1 million pounds in 2006.[2] The trend for mollusks followed a similar trajectory, with a thirty-five percent increase in mollusk imports, valued at an estimated $179 million, just during the first half of 2006.[3] What these trends show is that there is a high demand for seafood, which is met primarily through foreign imports. This demand, however, could be met domestically by promoting the U.S. aquaculture industries.

Although the import percentages and increased tonnage of farmed seafood products indicate that aquaculture is increasing on a global scale, wild fish stocks continue to decline. A scientific study from November

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* University of Maine School of Law, Class of 2008. The author would like to dedicate this Comment to her father, DeWitt S. Davies, in recognition of his love, support, and enthusiasm for the shellfish aquaculture industry.

1. UNITED STATES DEPARTMENT OF AGRICULTURE, AQUACULTURE OUTLOOK 5 (2006), *available at* http://usda.mannlib.cornell.edu/usda/current/LDP-AQS/LDP-AQS-10-05-2006.pdf. In the first seven months of 2006, the catfish imports totaled 14.8 million pounds. *Id.*

2. *Id.* at 8.

3. *Id.* at 13.

2006 predicts that global commercial fish stocks will collapse by the year 2048.[4] In recent years, there has been a global initiative to slow the decline of commercial fish stocks through the designation of marine reserve systems and the adoption of ecosystem-based management approaches. Pressure on wild stock viability, however, could be alleviated in the United States not only through the continued support and promotion of state-based aquaculture industries, but also through the implementation of a national offshore aquaculture industry.

Developing a centralized framework for an offshore aquaculture industry, and identifying the role of federal agencies and state regulatory bodies within this framework, are becoming imperative tasks in the United States. This is due not only to the predicted wild stock collapse, but also to the pressure to stay current with foreign nations that have already developed successful offshore industries. Generating public support for such a framework is tedious because many citizens possess a negative view of aquaculture.[5] It is important, however, to realize the positive effects the industry has on the nation's gross domestic product,[6] as well as on the nation's capabilities of becoming a global producer of sustainable seafood products.

There are a variety of approaches that aim to facilitate the United States' transition into farming the open ocean. Instead of adopting a radical approach, such as conferring exclusive property rights to farmers in the exclusive economic zone (EEZ), a combination of innovative management solutions, such as an ecosystem-based management approach and marine zoning, should be considered in developing a national offshore framework. The remaining sections of Part I of this Comment identify the challenges and conflicts that arise when considering a potential framework.

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4. Boris Worm et al., *Impacts of Biodiversity Loss on Ocean Ecosystem Services*, 314 SCIENCE 787, 790 (2006). A team of economists and ecologists from Nova Scotia's Dalhousie University determined that twenty-nine percent of fished species collapsed between 1950 and 2003. The predicted collapse is expected to occur, in part, due to a decrease in overall biodiversity. *Id.*

5. M. Richard DeVoe & Catherine E. Hodges, *Management of Marine Aquaculture: The Sustainability Challenge*, *in* RESPONSIBLE MARINE AQUACULTURE 21, 22 (R.R. Stickney & J.P. McVey eds., 2002) ("While we must continue to deal with the realities of improving aquaculture practices, the central issue now is one of perception, as well as reality.").

6. A USDA census indicated that the value of U.S. aquaculture products sold in 2005 totaled $1,092,386,000, $672,377,000 of which was from "food fish" products (shellfish and sport fish excluded). UNITED STATES DEPARTMENT OF AGRICULTURE, 2002 CENSUS OF AGRICULTURE 1 (2006) http://www.agcensus.usda.gov/Publications/2002/Aquaculture/AQUACEN.pdf (last visited Oct. 13, 2007). A state-specific census revealed that the value of aquaculture products sold in Maine in 2005 totaled $25,580,000. *Id.*

Background information on the nation's regulatory environment and examples of ecosystem-based management approaches are also included. Part II provides an analysis of the tentative provisions of the National Offshore Aquaculture Act of 2007, a recent attempt by Congress to develop a national offshore framework. Before adopting any of these tentative provisions, however, Congress should undertake an examination of successful state nearshore industries, and Part III of this Comment is devoted to an in-depth examination of the State of Maine's nearshore aquaculture laws and regulations. Maine is one of a few states experimenting with an ecosystem-based management approach to managing marine resources, and is a national leader in aquaculture development, regulation, and innovation. Part IV provides a discussion on how Maine laws, regulations, and policies can provide a template for drafting revisions and additions to the National Offshore Aquaculture Act that ensure an efficient and streamlined framework for this new, risky, and innovative venture. Finally, Part V offers the conclusion that future enactment of a successful and sustainable offshore framework is attainable through these recommendations.

A. Identifying Initial Conflicts and Risks in Developing an Offshore Framework

During the early 1980s, the federal government enacted statutes and policies aimed at promoting the development and innovation of the U.S. aquaculture industry.[7] However, although research and development efforts have increased in recent years,[8] there is no question that the obstacles to developing a national framework for offshore aquaculture remain, including those imposed by existing ocean and coastal legislation, and the overlapping

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7. NATIONAL RESEARCH COUNCIL, MARINE AQUACULTURE: OPPORTUNITIES FOR GROWTH 66 (1992) [hereinafter NRC]. One such statute, The National Aquaculture Act of 1980, created the Joint Subcommittee on Aquaculture (JSA), which consists of a conglomerate of agency representatives who focus on research and development of industry practices. *Id.* at 67. Policy development, however, "has been confined largely to general policy statements of support, the conduct of repeated studies on the obstacles facing aquaculture, and the formation of interagency mechanisms, that . . . lack any substantial power and authority." *Id.* at 70.

8. For example, the National Oceanic and Atmospheric Administration (NOAA) created a Small Business Innovation Research Program, which funds researchers at the University of New Hampshire in their Open Ocean Aquaculture Project, the goal of which is to develop inexpensive, experimental fish cages that can withstand the force of the open ocean. Experimental Fish Cage Makes a Splash, http://ooa.unh.edu/news/7_2006/fishcage.html (last visited Oct. 13, 2007).

authorities of various federal agencies.[9] In developing a workable framework, therefore, it is necessary to consider an overwhelming number of federal statutes, including the Coastal Zone Management Act (CZMA),[10] the Clean Water Act (CWA),[11] the Outer Continental Shelf Lands Act (OCSLA),[12] the Rivers and Harbors Act (RHA),[13] the Marine Mammal Protection Act (MMPA),[14] the Marine Protection, Research and Sanctuaries Act (MPRSA),[15] and the Magnuson-Stevens Fishery Conservation and Management Act (MSA).[16] Adding to the complexity are the number of agencies that are granted authority and discretion through existing legislation, including the Environmental Protection Agency (EPA) and the Army Corps of Engineers, the National Oceanic and Atmospheric Administration (NOAA) and its National Marine Fisheries Service (NMFS), the Fish and Wildlife Service (USFWS), and the United States Department of Agriculture (USDA).[17] Moreover, it is also critical to consider the role of states in the leasing and permitting procedures. Under the CZMA, the states

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9. Alison Rieser, *Defining the Federal Role in Offshore Aquaculture: Should it Feature Delegation to the States?*, 2 OCEAN & COASTAL L.J. 209, 218-24 (1997).

10. 16 U.S.C. §§ 1451-1465 (2006).

11. 33 U.S.C. §§ 1251-1387 (2006). Under the Clean Water Act, the EPA is required to ensure that aquaculture facilities obtain the requisite National Pollution Discharge Elimination System (NPDES) permits to comply with technological and water-quality standards for discharging point sources. *Id.* § 1342. In Maine, the Department of Environmental Protection (DEP) is delegated the authority to issue NPDES permits. NORMANDEAU ASSOCIATES, INC. & BATTELLE, MAINE AQUACULTURE REVIEW 3 (2003), *available at* http://www.maine.gov/dmr/aquaculture/reports/MaineAquacultureReview.pdf.

12. 43 U.S.C. §§ 1331-1356a (2006).

13. 33 U.S.C. §§ 401-467n (2006). The Army Corps of Engineers is delegated the authority to issue permits for the placement and construction of structures in navigable waters. *Id.* § 403.

14. 16 U.S.C. §§ 1361-1407 (2006). The National Oceanic and Atmospheric Administration (NOAA) is responsible for protecting marine mammals. *Id.* § 1362 (12)(a)(1).

15. 16 U.S.C. §§ 1431-1445c-1 (2006). This Act regulates the development and management of marine areas with "special national significance." *Id.* § 1431(b)(1).

16. 16 U.S.C. §§ 1801-1882 (2006). Management and conservation plans are implemented for the protection of fishery resources, including designating habitat areas as "essential fish habitat" (EFH) for spawning, feeding, and breeding grounds. *Id.* § 1853 (a)(7).

17. Rieser, *supra* note 9, at 220. The Army Corps of Engineers is primarily responsible for issuing state licenses and permits in accordance with the Rivers and Harbors Act, as amended by the Outer Continental Shelf Lands Act (OCSLA). *Id.* The EPA is involved in regulating pollutants and discharges in navigable waters under the CWA, and thus regulates the discharge of waste from aquaculture facilities. *Id.* For a discussion of the federal regulatory regime see Jeremy Firestone et al., *Regulating Offshore Wind Power and Aquaculture: Messages from Land and Sea*, 14 CORNELL J.L. & PUB. POL'Y 71, 78-84 (2004). The Coast Guard, an additional authority, ensures that the appropriate navigational standards are imposed to aid vessels. *Id.* at 84.

receive federal grants for coastal management plans. Through the consistency provision in the CZMA,[18] any activity that takes place in the EEZ, or beyond the three-mile territorial sea limit, "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."[19] States, therefore, have a right to reject a proposed offshore aquaculture facility, in which case the Secretary of Commerce can review the rejection.[20]

In addition to these statutory and executive agency barriers, there are other risks that must be addressed in developing a streamlined offshore framework. The certain economics of offshore operations in the United States are, for the most part, unknown; risks may include high transportation costs and market competition between seafood sold by commercial fishermen and farmed products.[21] Foreign competition is also a problem, as the minimal restrictions on seafood imported into the United States encourage foreign competition and reduce the sale of native products.[22]

Environmental risks are also prevalent, which vastly contribute to the negative attitude maintained by most citizens towards aquaculture. Regardless of whether the facility is offshore or on the coast, the potential for biological pollution from facilities exists due to the introduction of transgenic fish and the potential escape of farmed fish into wild stocks.[23] The gravity of this problem is exacerbated by the fact that most farmed fish in the United States are non-indigenous to the farm site and most species are usually farmed outside their optimal range.[24] The weakened condition of the farmed fish also compels the use of antibiotics at finfish facilities, which, in turn, promotes the development of antibiotic resistant fish and

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18. 16 U.S.C. § 1456(c) (2006).

19. *Id.* § 1456(c)(1)(A).

20. *Id.* § 1456(c)(3)(A).

21. Porter Hoagland et al., *The Optimal Allocation of Open Space: Aquaculture and Wild-Harvest Fisheries,* 18 MARINE RESOURCE ECONOMICS 129, 130 (2003). This economic study focused on the competition between offshore aquaculture and commercial fishing, both in the ocean and in the market. Results indicated that "when aquaculture exerts a significant negative impact on the fishery, the economic optimum [suggests that] . . . the region should be allocated exclusively for either aquaculture or commercial fishing[], and the coexistence of the two uses is suboptimal." *Id.* at 145.

22. NRC, *supra* note 7, at 73; J.A. DUFF ET AL., A REVIEW OF LEGAL AND POLICY CONSTRAINTS TO AQUACULTURE IN THE US NORTHEAST 15 (2003), *available at* http://www.nrac.umd.edu/files/whitepapers/wp_no5_policy.pdf.

23. REBECCA J. GOLDBURG ET AL., PEW OCEANS COMMISSION, MARINE AQUACULTURE IN THE UNITED STATES: ENVIRONMENTAL IMPACTS AND POLICY OPTIONS 6-7 (2001).

24. *Id.* at 6.

human pathogens.[25] Organic pollution and eutrophication, caused by fecal matter and the addition of fish feed to net pens, also contribute to a decline in water quality and habitat modification.[26] Thus, in developing a framework, there are multiple considerations; however, "the trick [to offshore aquaculture] is getting a handle on the risks involved, including those associated with the regulatory environment."[27]

B. The Complex Regulatory Environment

The development of an offshore aquaculture framework does not solely rely on examining the interplay between federal legislation and agency action. Rather, regulatory practices at the state and local levels of government reveal factors that inhibit and promote sustainable coastal aquaculture, which should also be considered in developing an offshore framework. Specifically, administrative and jurisdictional overlap, as well as lease and permitting policies, have been identified by members of the nearshore aquaculture industry as factors that constrain growth.[28] Administrative overlap occurs when a state department controls the industry, but other departments have authority over the land. Similarly, at the local level, towns and counties might have jurisdiction over local waters.[29] States also have special statutory provisions regarding the leasing process due to the public trust doctrine, which governs a state's territorial sea (from the mean low tide mark out to three nautical miles).[30] Leasing provisions must minimize conflicts with public trust uses, such as fishing, recreation, and navigation, which can be accomplished by placing limits on the size of the

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25. *Id.* at 16.

26. *Id*. at 12-14; *see also* THE AQUACULTURE DEVELOPMENT COUNCIL, AQUACULTURE PLANNING IN WESTERN AUSTRALIA 35 (1997).

27. Tracey Crago, *The Risky Business of Offshore Marine Aquaculture*, TWO IF BY SEA, Winter/Spring 2003, *available at* http://www.web.mit.edu/seagrant/pubs/2ifbysea/issues/spring99/aquaculture.html.

28. DUFF ET AL., *supra* note 22, at 10. The authors submitted a survey to northeast aquaculture industries, as well as state aquaculture coordinators, to identify factors that impede and foster the growth of the nearshore industry, and subsequently compiled a database of state statutes to determine what laws and regulations constrain the industry. *Id.* at 4.

29. *Id.* at 11. Administrative overlap can cause confusion and constrain members from entering the industry. *Id.*

30. *Id.* at 12-13; Tim Eichenberg & Barbara Vestal, *Improving the Legal Framework for Marine Aquaculture: The Role of Water Quality Laws and the Public Trust Doctrine,* 2 TERR. SEA J. 339, 347 (1992).

leased area, the length of the lease term, and the conditions that must be satisfied for lease renewal.[31]

In addition to the administrative overlap and public trust issues with regard to leasing provisions, there are use conflicts in the territorial sea that reflect the potential conflicts that would likely develop with aquaculture in the EEZ. Nearshore use conflicts include disruption of recreational activities and aesthetic concerns,[32] as most coastal residents wish to preserve the shore for recreational fishing and bathing, as well as to maintain the pristine views from coastal residences.[33] These concerns are largely non-existent in an offshore framework. Competition with commercial fishing activities, however, is a concern for both nearshore and offshore facilities. Conflicts erupt over the utilization of available space by aquaculture facilities, which encroach upon commercial fishing areas. One result of space allocation to offshore facilities is that commercial fishing efforts may have to use more capital to get to the limited fishing areas, which may increase harvesting costs.[34] Further, if natural stocks do not migrate out of areas allocated for aquaculture facilities, then the carrying capacity of natural stocks accessible to commercial fishermen will likely be reduced.[35] Additional concerns for offshore facilities include conflicts with navigation, oil rigs, military operations, scientific research, marine reserve systems, and privatization of federal waters.[36] In addressing these conflicts, lease provisions:

> [s]hould identify . . . public and private uses of the marine environment that are potentially affected by aquaculture activities. [They] should then provide a fair but efficient process for information to be brought forward about those uses in the area proposed for use as a sea farm, allowing the leasing agency to make

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31. Eichenberg & Vestal, *supra* note 30, at 359. In recognition of the tension between issuing aquaculture leases and the state's public trust doctrine, the authors recommend that state leasing provisions incorporate public trust concerns into the statutory standards, which must be met before a lease can be granted. *Id.* at 373.

32. NRC, *supra* note 7, at 81 & 86.

33. *See* Nancy Walworth, *Regulating Aesthetics of Coastal Maine: Kroeger v. Department of Environmental Protection,* 11 OCEAN & COASTAL L.J. 99 (2005-06) (case note discussing coastal aesthetic regulation).

34. Hoagland et al., *supra* note 21, at 130.

35. *Id.*

36. Firestone et al., *supra* note 17, at 72. This article addresses the number of new ocean uses that have recently developed, "including bio-prospecting, wave energy, tidal energy, [and] offshore wind power development." It is no wonder that "[m]arine aquaculture has a relatively weak base in the conflict over the use of coastal ocean resources and space . . . compared to more established groups promoting other uses of the ocean and coastal environment (e.g., fisheries, oil and gas)." NRC, *supra* note 7, at 72.

> a balanced and informed decision in which other users believe they have been fairly considered.[37]

C. An Ecosystem-Based Management Approach: Marine Zoning

In general, the greater the number of conflicting interests and users in a marine area, the harder it is to manage each competing interest while still conserving existing uses and biodiversity. Recently, scientists and policy-makers have been advocating an ecosystem-based management (EBM) approach to manage fisheries, which is a shift from a single-species management approach to a holistic regulatory scheme that encompasses the entire marine ecosystem, including humans.[38] The four objectives that EBM aims to achieve are:

> (i) avoid degradation of ecosystems, as measured by indicators of environmental quality and system status; (ii) minimize the risk of irreversible change to natural assemblages of species and ecosystem processes; (iii) obtain and maintain long-term socio-economic benefits without compromising the ecosystem; and (iv) generate knowledge of ecosystem processes sufficient to understand the likely consequences of human actions.[39]

These four objectives should maintain a dominant, overarching role when considering the implementation of an EBM scheme. The first three steps in implementing such a scheme require: (1) examining all of the uses and potential uses in a marine ecosystem, (2) identifying the irreversible or reversible impacts of each use, and (3) designating protected areas that are critical for species recruitment and population regeneration.[40]

Marine zoning is an example of an EBM approach focused "on spatial planning that separates and balances conflicting uses within an ecosystem."[41] There are two fundamental components of marine zoning: a map

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37. Rieser, *supra* note 9, at 213.

38. U.S. COMMISSION ON OCEAN POLICY, AN OCEAN BLUEPRINT FOR THE 21ST CENTURY 6 (2004), *available at* http://www.oceancommission.gov/documents/full_color_rpt/welcome.html; PEW OCEANS COMMISSION, AMERICA'S LIVING OCEANS: CHARTING A COURSE FOR SEA CHANGE 8 (2003), *available at* http://www.pewtrusts.org/uploadedFiles/wwwpewtrustsorg/Reports/Protecting_ocean_life/env_pew_oceans_final_report.pdf.

39. E.K. Pikitch et al., *Ecosystem-Based Fishery Management,* 305 SCIENCE 346, 346 (2004).

40. *Id.*

41. CHRISTINE O'CONNELL, WHITE PAPER ON MARINE ZONING: AN EXAMINATION OF SOME CURRENT MARINE ZONING EFFORTS AND THEIR POTENTIAL APPLICATIONS IN LONG ISLAND SOUND 6 (2006).

that depicts the zones in a particular area and regulations applicable to each zone.[42] Multiple-use zoning plans have been developed in which marine protected areas (MPAs), buffer zones, and multiple-use zones are designated within an ecosystem.[43] MPAs range in the level of permissible activity, with the most restrictive areas designated as "no-take" zones.[44] The buffer zones surrounding the MPAs smooth the transition from limited-use zones to multiple-use zones, and permit a wide variety of competing uses, including commercial fishing, navigation, technology and development projects, as well as aquaculture.[45]

Confining aquaculture to exclusive zones is projected to decrease potential conflicts that would occur if other uses simultaneously existed in a particular area. Specifically, "[b]y concentrating aquaculture in particular areas, conflicting uses[,] such as boating[,] can be excluded, decreasing liability and minimizing theft and vandalism."[46] Zoning areas for aquaculture, however, does have drawbacks, such as the degradation of water quality from the concentration of farms in a specific area. Offshore zones may affect water quality significantly less due to a higher dilution rate and increased current speeds, as compared with zones configured near protected coastline in a state's territorial sea.

1. Case Study: Australia as a Global Leader in Marine Zoning

Australia, following the initiative of New Zealand, has taken the initiative to create an ocean zoning plan, spanning from the coastline to the 200 nautical mile EEZ limit. In 1975, the Great Barrier Reef (GBR) Marine Park was created, which was the world's first large-scale experiment in marine zoning.[47] The Park is composed of a variety of zones, including a General Use Zone, Habitat Protection Zone, Conservation Park Zone, Buffer Zone, Scientific Research Zone, Marine National Park Zone, and a

42. FARA COURTNEY & JACK WIGGIN, GULF OF MAINE COUNCIL FOR THE MARINE ENVIRONMENT, OCEAN ZONING FOR THE GULF OF MAINE: A BACKGROUND PAPER 5 (2003).

43. O'CONNELL, *supra* note 41, at 6.

44. *Id.*

45. *Id.*

46. COURTNEY & WIGGIN, *supra* note 42, at 17.

47. O'CONNELL, *supra* note 41, at 10-11. The Great Barrier Reef (GBR) Marine Park spans 345,000 km^2 and is regulated by the GBR Marine Park Authority, an agency that has jurisdiction over the Park itself and adjacent areas outside Park boundaries. *Id.* Thus, the Authority has exclusive power to regulate uses on land or outside Park boundaries that could have a significant, negative impact on the Park's integrity, and this exclusive authority "may supercede other authorities or provide a coordinating function." *Id.*

Preservation Zone.[48] Aquaculture, a designated use, can be conducted in the General Use Zone and the Habitat Protection Zone with a required permit.[49] In all of the remaining aforementioned zones, aquaculture is not permitted.[50] This park has proven to be a successful prototype for global zoning initiatives, and is an excellent example of implementing an EBM approach, as existing uses, critical habitat areas, and marine resources were identified and considered in spatially planning each zone.[51] Success of the GBR Park was generally linked to the designation of zones with a specific objective, as well as separating conflicting interests into different zones.[52]

In Tasmania, Australia, marine farming is popular in the southeastern urban areas near the capital city of Hobart. In 1995 the government enacted the Living Marine Resources Act and the Marine Farming Planning Act, which required the development of Marine Farming Development Plans (MFDPs) for each farming area.[53] "Each plan details areas that are zoned for marine farming, and within each zone are allocated leases, which are the actual areas to be farmed."[54] Entrepreneurs who want to lease the seabed and corresponding water column for farming activities must apply for a lease, as well as a farm operation license.[55] Environmental monitoring activities are required, including routine monitoring for finfish farm areas, which can be performed with video surveillance of the seabed.[56] The MFDPs, coupled with the environmental monitoring requirements, reduced conflicts among marine users, and also provided a streamlined management framework that resulted in an orderly allocation of water rights and environmental sustainability.

D. Policy Ideas for an Offshore Framework

There have been numerous recommendations for an offshore framework, which range from general policy statements to more specific action plans. In its general recommendation, the NRC provided that the framework "should have an environmental impact assessment . . . ; it should be aimed at identifying potential impacts on other users and evaluating

48. *Id.* at 12, Fig. 4.
49. *Id.*
50. *Id.*
51. *Id.* at 13.
52. *Id.*
53. Christine Crawford, *Environmental Management of Marine Aquaculture in Tasmania, Australia*, 226 AQUACULTURE 129, 131 (2003).
54. *Id.*
55. *Id.*
56. *Id.* at 133-34.

appropriate strategies; it should provide a fair return to the public from the use of public waters, in the form of lease payments, royalties, and rents."[57] Eleven years after the NRC recommendation, the Pew Oceans Commission provided no further insight, as it generally suggested implementing a "new national marine aquaculture policy based on sound conservation principles and standards."[58] Another general alternative included making revisions to the National Aquaculture Act of 1980, which focused on reauthorizing power granted to each federal agency and the elimination of duplicative laws.[59]

Yet, some advocate the granting of exclusive private property rights in the EEZ, which would be a radical departure from the existing nearshore permitting and leasing system.[60] In addition, a decentralized regulatory framework has been proposed, which focuses on the delegation of certain powers to states in coordinating a permitting process.[61] Thus, it is obvious that there is a lack of consensus as to how to organize and implement an offshore framework.

II. THE NATIONAL OFFSHORE AQUACULTURE ACT OF 2007

Senator Ted Stevens, Republican of Alaska, along with co-sponsor Senator Daniel Inouye, Democrat of Hawaii, introduced the National Offshore Aquaculture Act of 2005[62] in the U.S. Senate Committee on Commerce, Science, and Transportation on June 8, 2005.[63] Amendments

57. NRC, *supra* note 7, at 86.

58. PEW OCEANS COMMISSION, *supra* note 38, at xi.

59. DeVoe & Hodges, *supra* note 5, at 37.

60. Firestone et al., *supra* note 17, at 104. The authors made five recommendations for management of the EEZ: 1) privatization; 2) addressing use conflicts and compensation for use of public resources; 3) addressing and compensating local impacts; 4) site closure funding; 5) and management by a single entity, or the creation of a new cabinet-level department. *Id.* at 104. The authors recommend an ecosystem-based management approach, but only devote one sentence to the subject. *Id.* at 108. Recommending this type of approach, which is a relatively new management approach, requires more than just a statement—it requires clarification as to how this will be accomplished.

61. Rieser, *supra* note 9, at 216-18. Elements include: the designation of marine zones for farms; a common lease application procedure; lease provisions specifying the exclusive property interest in the cultured species; coordination of enforcement between state and federal agencies; maximum size limitations on farms; a system of priority for displaced commercial fishermen; encouragement of private agreements between applicants and other potential EEZ users; public hearings; the creation of an insurance pool for potential losses; and reduced application requirements for small-scale farmers. *Id.*

62. S. 1195, 109th Cong. (2005).

63. NOAA Aquaculture, Offshore Aquaculture, http://www.nmfs.noaa.gov/aquaculture/offshore2005.htm (last visited Oct. 13, 2007).

were printed on September 15, 2005 and two hearings were scheduled before the Committee on April 6, 2006 and June 8, 2006.[64] Maine Republican Senator Olympia Snowe was present at the April Committee meeting, in which she delivered a statement expressing her support for an offshore aquaculture industry.[65] Senator Snowe recognized that the United States is lagging behind other foreign nations that have already developed an offshore framework, but also stressed the importance of examining Maine's nearshore aquaculture industry, as it has been a successful pioneer in expanding the industry in coastal communities.[66] Sebastian Belle, the Executive Director of the Maine Aquaculture Association (MAA),[67] also attended the Committee hearing as a testifying witness, and suggested additional modifications and improvements to the Act that are necessary to address concerns expressed by the private industry sector.[68] Echoing Senator Snowe, Belle further stated that if the United States does not enter the offshore aquaculture industry, it would become strictly a consumer nation of farmed seafood products imported from "jurisdictions that often have no environmental standards or enforcement."[69] Most importantly, however, Belle stressed the need for the Act to establish an investment incentive and development program, as members of the industry will not invest in the venture unless the United States contributes significant funds in the form of start-up capital and grants.[70]

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64. *Id.*

65. U.S. Senator Olympia J. Snowe website, *Snowe Voices Support for Offshore Aquaculture and Sustainable Fisheries*, http://snowe.senate.gov/public/index.cfm?FuseAction=PressRoom.PressReleases&ContentRecord_id=6BC8B8BB-D1E9-412A-ACB0-F61BB95B0978 (last visited Oct. 13, 2007).

66. *Id.* According to Senator Snowe:

> Maine is finding ways to create jobs in coastal communities and sustain a vital component of the seafood economy, and ongoing research is pointing to new ways to support this industry's expansion. Despite . . . potential challenges, the economic and public health benefits that could accompany aquaculture and the value of it in Maine make it worthwhile for us to consider the future of this industry in the United States.

Id.

67. The Maine Aquaculture Association (MAA) is the oldest state aquaculture association in the United States. Maine Aquaculture Association, About MMA, http://www.maineaquaculture.com/html/about_maa.html (last visited Oct. 13, 2007).

68. *The National Offshore Aquaculture Act of 2007: Hearing on S. 1195 Before the S. Comm. on Commerce, Science, and Transportation,* 109th Cong. (2006) (statement of Sebastian Belle, MAA), *available at* http://commerce.senate.gov/pdf/belle-040606.pdf.

69. *Id.* at 2. Belle argues that "[t]he environmental risk and potential damage of [foreign] operations will be much larger than operations allowed to develop in the US under the framework proposed in [the Act]." *Id.*

70. *Id.* at 32-33. He states, "[i]nvestment and development will only occur if the

After no action was taken by the 109th Congress, and after numerous revisions of the Act, Commerce Secretary Carlos M. Gutierrez announced and presented the National Offshore Aquaculture Act of 2007[71] on March 12, 2007 to the 110th Congress.[72] A constituent briefing, which was open to the public, was scheduled by Dr. William Hogarth, NOAA's Assistant Administrator of Fisheries, on March 15, 2007 to provide an overview of the provisions and the revisions from the 2005 proposal.[73] The most recent action on the pending Act, however, occurred on July 12, 2007, when Vice Admiral Lautenbacher, the Under Secretary for Oceans and Atmosphere at NOAA, testified before the House Natural Resource Committee's Subcommittee on Fisheries, Wildlife and Oceans.[74]

A. National Offshore Aquaculture Act of 2007 Provisions

In general, the purpose of the Act is "[t]o provide the necessary authority to the Secretary of Commerce for the establishment and implementation of a regulatory system for offshore aquaculture in the United States Exclusive Economic Zone."[75] The Secretary, therefore, is granted broad authority to issue or suspend permits, identify and monitor environmental requirements, and to establish general rules and processes "to make the areas of the Exclusive Economic Zone available to eligible persons for the development and operation of offshore aquaculture facilities."[76]

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business community has confidence that its investments will be safe and will yield a reasonable return." *Id.* at 2.

71. National Offshore Aquaculture Act, H.R. 2010, 110th Cong. (2007).

72. Press release, National Oceanic and Atmospheric Administration, Commerce Secretary Gutierrez Announces Bush Administration Bill to Boost Offshore Aquaculture (Mar. 12, 2007), *available at* http://www.nmfs.noaa.gov/mediacenter/aquaculture/docs/06_DOC%20News%20Rel%20on%202007%20Offshore%20Bill.pdf.

73. Announcement from NOAA, 2007 Offshore Aquaculture Legislation Sent to Congress: NOAA Stakeholder Briefing Set for March 15 in Washington D.C., *available at* http://www.nmfs.noaa.gov/mediacenter/aquaculture/docs/07_Announcement_%20AQ%20Constit%20Brief%20on%20March%2015%202007-1.pdf.

74. *The National Offshore Aquaculture Act of 2007: Hearing on H.R. 2010 Before the S. Comm. on Fisheries, Wildlife and Oceans*, 110th Cong. (2007) (statement of VADM Conrad C. Lautenbacher, Jr.), *available at* http://aquaculture.noaa.gov/pdf/13_lautenbacher testimony.pdf.

75. H.R. 2010.

76. *Id.* § 4(a). Even though the Secretary is given authority to implement permitting and other provisions in the Act, the Secretary must consult with various federal agencies that are also authorized to issue permits in the EEZ, such as permits for oil and mineral extraction, as well as with coastal states and regional fisheries management councils. *Id.* § (4)(a)(4). The consulting process must include establishing additional environmental requirements that

As for the permitting requirements, the Act provides that each person or entity interested in establishing an offshore facility must apply for and receive a permit. The duration of each permit is twenty years and is subsequently renewable in up to twenty-year increments.[77] This is a substantial change from the Act of 2005, in which the permit duration was for ten years with an option to renew in five-year increments.[78] Further, the Act of 2005 required the facility operator to obtain two permits, a site permit and an operational permit. An operational permit identified each marine species to be raised, and other operational details, including necessary equipment,[79] and a site permit designated the area of the water column each facility operator would occupy. A similarity between the 2005 proposal and the 2007 bill is that they both require the Secretary to demonstrate that the proposed aquaculture activity will be compatible with other uses before granting a permit.[80] In addition, the Secretary must also consult with the Secretary of the Department of the Interior regarding permits for facilities that are located on leases or easements permitted under the OCSLA.[81]

Permit issuance, as aforementioned, must also comply with environmental requirements, which include "environmental monitoring, data archiving, and reporting by the permit holder."[82] In complying with these requirements and identifying environmental risks, the Secretary must consult with all appropriate Federal agencies, coastal states, and regional

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relate to identified environmental risks, including elimination of disease, conservation of genetic resources, and reducing biological and chemical pollution. *Id.* § 4(a)(4)(A)-(F).

77. *Id.* § 4(b)(2)(C).

78. S. 1195, 109th Cong. § 4(b)(3) (2005).

79. *Id.* § 4(c).

80. H.R. 2010 § 4(d)(1)–(7). First:

> [t]he Secretary shall consult as appropriate with other Federal agencies, coastal States, and regional fishery management councils to ensure that offshore aquaculture for which a permit is issued under this section is compatible with the use of the Exclusive Economic Zone for navigation, fishing, resource protection, recreation, national defense . . . , mineral exploitation and development;

second, the Secretary cannot issue a permit if a coastal State opposes the facility or activity; third, the permit holder and all persons subject to the Act must comply with the CZMA; fourth, the activity cannot interfere with conservation measures in the MSA; fifth, the Secretary must consult with the Coast Guard to ensure that navigational safety zones are established around the facility; sixth, the Secretary of Defense can designate the navigational safety zone; and seventh, the Secretary has authority to suspend or revoke any permit. *Id.*

81. *Id.* § 4(e).

82. *Id.* § 4(a)(4)(D). An interesting addition to the Act of 2007 includes the requirement "that marine species propagated and reared through offshore aquaculture be species native to the geographic region," unless a risk assessment shows that escape of a non-indigenous species would be negligible to the surrounding environment. *Id.* § 4(a)(4)(E).

fishery management councils.[83] Further, the Secretary must prepare an environmental impact statement (EIS) or an environmental analysis (EA) to comply with the National Environmental Policy Act[84] (NEPA).[85] These requirements are intended to address potential risks including: impacts on wild fish populations, the marine ecosystem as a whole, water quality, and marine mammals.[86]

The Secretary may assess permit fees, including application fees and annual maintenance fees.[87] A permit holder must provide the Secretary with a financial guarantee or evidence of a bond.[88] The Secretary also has the authority to designate research and development programs to further technological advancement.[89]

A careful examination of the Act as a whole reveals that there are still gaps to fill before it is enacted. Even though the Act confers broad authority on the Secretary of Commerce, there are significant limitations that are imposed on that authority through mandatory consultation provisions with federal agencies that are also involved in regulating the EEZ. While the goal of the Act is to establish a streamlined permitting process with adequate attention to marine ecosystem protection, the mandatory consultation provisions suggest that this process is far from streamlined. In fact, the administrative burden created by such provisions might hinder an efficient and streamlined process.

Further, the Act does not outline detailed financial incentives or incentives for research and development. Consequently, the business sector of the aquaculture industry is, as Sebastian Belle of the MAA feared, still ignored. While the offshore aquaculture industry can exist in the United States, improvements and revisions to the Act are necessary for the industry to thrive. An examination of the State of Maine's aquaculture regulations and ecosystem management initiatives may provide guidance in formulating further revisions to bring the Act closer towards fruition.

III. THE STATE OF MAINE AQUACULTURE INDUSTRY

The Maine aquaculture industry operates from the southern coastal waters in Kittery to as far north as Eastport, and consists of everything from

83. *Id.* § 4(a)(4).
84. 42 U.S.C. §§ 4321-4370f (2006).
85. H.R. 2010 § 4(a)(2).
86. *Id.* § 4(a)(4)(A)-(B).
87. *Id.* § 4(c).
88. *Id.*
89. *Id.* § 5(a).

small, part-time farms, to large, full-time companies with multiple lease sites.[90] As of August 14, 2007, there were seventy-five shellfish leases comprising a total of 714.37 acres, as well as twenty-nine finfish leases, covering a total of 580.33 acres.[91] In general, farmed shellfish species include mussels, hard clams, and eastern oysters,[92] while farmed finfish species include salmon and trout.[93]

Maine's Department of Marine Resources (DMR) is responsible for overseeing and implementing regulations relating to the state's finfish and shellfish aquaculture industries,[94] and generally serves as the primary state agency that assists Maine's fishing community.[95] Exclusive authority to implement DMR laws and regulations is vested in the Commissioner, who, in regard to the aquaculture industry, has the power to grant leases and licenses upon review of submitted applications.[96] Leases provide a facility operator with a greater proprietary interest in the coastal waters. In contrast, temporary licenses are issued to entrepreneurs entering the industry who are experimenting with various farmed species and locations. In addition, the Commissioner also has exclusive authority to establish conditions for

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90. Maine Department of Marine Resources, Aquaculture Lease Inventory, http://www.maine.gov/dmr/aquaculture/leaseinventory2006/index.htm (last visited Oct. 11, 2007).

91. *Id.*

92. USDA, 2005 CENSUS OF AQUACULTURE 63-65 (2005), *available at* http://www.agcensus.usda.gov/Publications/2002/Aquaculture/aquacen2005_17.pdf. Maine is ranked third in the nation for mussel production and fourth in the nation for eastern oyster cultivation, as well as third for producing eastern oyster larvae and seed. *Id.*

93. USDA, 2005 CENSUS OF AQUACULTURE 30-34 (2005), *available at* http://www.agcensus.usda.gov/Publications/2002/Aquaculture/aquacen2005_08.pdf. Maine is ranked first in the nation for salmon farming with a total of six farms. *Id.*

94. Those regulations concerning aquaculture are compiled in the Code of Maine Rules. 13-188 ME. CODE R. §§ 2.05- 2.90 (1983), *available at* http://www.maine.gov/sos/cec/rules/13/chaps13.htm (last visited Sept. 9, 2007).

95. *See* Maine Department of Marine Resources Home and News, http://www.maine.gov/dmr/index.htm (last visited Oct. 11, 2007).

> The Maine Dept. of Marine Resources was established to conserve and develop marine and estuarine resources; to conduct and sponsor scientific research; to promote and develop the Maine coastal fishing industries; to advise and cooperate with local, state, and federal officials concerning activities in coastal waters; and to implement, administer, and enforce the laws and regulations necessary for these purposes.

Id.

96. 12 M.R.S.A. § 6072(1) (2005). "[T]he commissioner's power to lease lands under this section is exclusive." *Id.*

compatible use of each lease site,[97] as well as to implement and sponsor programs for research, development, and marketing techniques.[98]

A. The Application Process

The application process consists of filing a written application, after which the Commissioner provides notice of the pending lease and information regarding a public hearing to: the municipality where the lease is to be located; the Departments of Environmental Protection; Conservation and Inland Fisheries and Wildlife;[99] and to riparian landowners who are within 1,000 feet of the proposed coastal lease site.[100] Even though the lessee must address any ecological impacts that could result from the proposed activity, the DMR must conduct an environmental survey for potential impacts prior to the public hearing date, as well as to determine possible conflicts that might arise with commercial fisheries and near-shore navigation.[101] The Department also requires an applicant to show evidence of an escrow account or performance bond.[102]

B. Types of Leases and Licenses

Upon deciding that a proposed lease site will not unreasonably interfere with commercial fishermen and riparian landowners, or pose ecological harm to significant wildlife and marine habitat,[103] the Commissioner can grant the applicant a standard lease with a duration of ten years covering a site area of at most 100 acres.[104] Standard leases are renewable for another

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97. *Id.* § 6072(7-B). "The commissioner may establish conditions that govern the use of the leased area . . . [and] [t]hese conditions must encourage the greatest multiple, compatible uses of the leased area." *Id.*

98. *Id.* § 6051. "[T]he commissioner[] may conduct or sponsor programs for research and development of . . . fishery resources . . . which may include biological, chemical, technological, hydrological, processing, depuration, marketing, financial, economic and promotional research and development." *Id.*

99. *Id.* § 6072(6)(C).

100. *Id.* § 6072(5). Applications must identify cultivated species, provide an informal environmental impact statement of the proposed project, and include signatures of riparian landowners whose land is to be used. *Id.* § 6072(4).

101. 12 M.R.S.A. § 6072(5-A).

102. 13-188 ME. CODE R. § 2.40(2)(A) (2006).

103. 12 M.R.S.A. § 6072(7-A).

104. *Id.* § 6072(2). Although no single lease may cover more than 100 acres, a lessee cannot hold an aggregate of more than 300 acres. The Governor's Task Force on Planning and Development of Marine Aquaculture received feedback from farmers that an acreage cap deterred investment and discouraged larger companies from doing business in Maine.

ten-year term upon acceptance of a renewal application,[105] and further, leases are transferable.[106]

The Commissioner can also issue limited-purpose leases for commercial or scientific research, in which the duration is less than the standard lease, or three years, and the size of the site cannot exceed two acres.[107] In general, a lessee who would like to determine whether to apply for a standard lease may first apply for the limited-purpose commercial lease to experiment with finfish or shellfish farming; this limited commercial lease, however, is non-renewable,[108] whereas limited leases for scientific purposes are renewable.[109]

In addition to granting leases, the Commissioner has the authority to grant limited-purpose aquaculture (LPA) licenses. The LPA "licensing program provides applicants with the opportunity to obtain a one-year license to rear any of five specific species of shellfish (mussels, oysters, soft-shell clams, quahogs, and hen clams) using particular gear types that cover no more than 400 square feet of area."[110] A benefit of the LPA license program is the informal application review process, which is distinguished from both the limited-purpose lease and standard lease application processes. The program also enables farmers to experiment with different coastal areas prior to submitting their standard lease applications.[111] Because LPA licenses are popular for start-up farmers, there are specific regulations limiting the density, or number, of LPA license holders in any given three-mile coastal area.[112]

The Task Force recommended that there should be an acreage limit capped at 500 acres, and that there should be incentives for small-scale farms to remain under a certain acreage limit through tiered rental fees. GOVERNOR'S TASK FORCE ON THE PLANNING AND DEVELOPMENT OF MARINE AQUACULTURE IN MAINE 8 (2004), *available at* http://www.maine.gov/dmr/aquaculture/aqtaskforce/AQTF_FullReport2-13.pdf [hereinafter TASK FORCE]. The Maine State legislature, however, recently approved an increase in the aggregate acreage from 300 to 1,000 acres. 13-188 ME. CODE R. § 2.12(3) (2007).

105. 12 M.R.S.A. § 6072(12).

106. *Id*. § 6072(12-A).

107. *Id*. § 6072-A(3) & (4).

108. *Id.* § 6072-A (19); Maine Department of Marine Resources, Aquaculture Lease Types, http://www.maine.gov/dmr/aquaculture/leasetypes.htm (last visited Oct. 11, 2007).

109. 12 M.R.S.A. § 6072-A(18).

110. *Id*. § 6072–C; DMR, Aquaculture Lease Types, *supra* note 108.

111. DMR, Aquaculture Lease Types, *supra* note 108. In addition, all application fees for LPAs are deposited exclusively in the Aquaculture Research Fund. 12 M.R.S.A. § 6081.

112. 13-188 ME. CODE R. § 2.90 (2007). "There can be no more than three (3) LPA licensed sites within a 1,000-foot radius of any other existing LPA licensed site. This standard does not require a minimum separation between individual leases, rather it is a density of licenses within any area of a 1,000-foot radius." *Id.*

Finally, the Commissioner can also issue emergency shellfish leases.[113] These emergency leases are only granted upon a showing that the health and safety of shellfish are threatened. These shellfish are subsequently transported to another suitable site where they will not degrade water quality, or have a harmful ecological impact.[114]

C. Monitoring, Research, and Development

Even though the Commissioner is vested with the exclusive authority to oversee Maine's aquaculture industry, an Aquaculture Advisory Council was established to "make recommendations to the [C]ommissioner concerning expenditures from the Aquaculture Management Fund . . . and concerning other matters of interest to the aquaculture industry."[115] The Commissioner appoints four members to the Council who represent different segments of Maine's aquaculture community, and the Commissioner serves as the fifth, "nonvoting, ex officio member."[116] All funds received from lease applications and from the levying of lease rents are deposited in the Aquaculture Management Fund,[117] and the Commissioner is granted authority to use these funds to develop more effective water-quality and monitoring criteria from recommendations of fellow Advisory Council members. In addition, the Aquaculture Research Fund consists of the funds received from the LPAs, and other sources, and is used to fund research and management activities.[118]

D. Maine's Aquaculture Task Force

In August 2003, the Maine Task Force on Planning and Development of Marine Aquaculture convened to provide a set of recommendations to the Joint Standing Committee on Marine Resources in its attempt to balance potential uses of state waters with a plan for the expansion of the marine aquaculture industry.[119] The Task Force included ninety-five recommendations for the Maine executive and legislative branches that suggest changes to both Maine laws and regulations, as well as to DMR policies.[120]

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113. 12 M.R.S.A. § 6072-B. Emergency leases have a limited duration of six months. *Id.* § 6072-B(6).
114. *Id.* § 6072-B(2)(C).
115. *Id.* § 6080(3).
116. *Id.* § 6080(1).
117. *Id*. § 6072-D(2).
118. *Id.* § 6081.
119. TASK FORCE, *supra* note 104, at 1.
120. *Id.*

Even though Maine does have a streamlined lease and licensing process, some members of the industry and the public voiced criticism in regard to the formality of the process and the lack of public participation.[121] The Task Force, however, noted that there was a benefit in having formal notice and comment of the proposed lease site, as well as an adjudicatory proceeding, and that this formal process should continue.[122]

Members of the industry also expressed their negative views toward the lease renewal procedure and transferability. Specifically, farmers disliked the formal hearing process for renewal or lease transfer that was required if five or more requests for a hearing were received, arguing that, "if you abide by all the conditions of your lease, you [should be able to] continue your business."[123] In response, the Task Force determined that it was sufficient for the Commissioner to determine lease renewal and transferability without the requirement of a hearing, and recommended that the statutory language mandating a hearing upon receipt of five or more requests should be deleted.[124] The adoption of this recommendation would provide a sense of certainty for those making investments in the industry.

Commercial fishermen also expressed concern about the adequacy of site reviews by the DMR. Such concerns noted that surveys are conducted at times of the year when the fish populations are not as abundant, due to migratory patterns and other environmental factors.[125] Similarly, lobstermen were concerned about competing for bottom space with aquaculture farms. In response, the Task Force recommended that the DMR perform a lease site review "when fishery potential is greatest."[126]

Regarding research and development, the Task Force recognized that foreign nations with successful near-shore aquaculture industries have dedicated funds to research issues, such as biological and site impacts on water quality, as well as equipment performance, and the effects of these factors on a single species.[127] In Maine, the Maine Technology Institute (MTI) and the Maine Aquaculture Innovation Center (MAIC) "have funded a number of companies and research institutions to develop new production

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121. *Id.* at 36.

122. *Id.* at 38.

123. *Id.* at 48.

124. *Id.* at 49. This recommendation would result in a deletion of statutory language in 12 M.R.S.A. § 6072(12) and (12-A).

125. *Id.* at 63.

126. *Id.* at 64.

127. *Id.* at 79. The Task Force cited nations such as Norway, Chile, and parts of Canada, including British Columbia and New Brunswick. In all of these nations, there was a significant amount of continuous investment in public research and development for aquaculture. *Id.*

methods and technologies for the Maine aquaculture industry."[128] Although there is initiative from the MTI and the MAIC to fund research, the Task Force recognized that most of the research and development efforts are "entrepreneurial and piece-meal and in need of better coordination."[129] The Task Force, therefore, recommended a research initiative focused on determining which single species is most economically viable, and focusing research efforts on improving the methods of cultivation for that species. The Task Force suggested that bond funds be used to support this research.[130]

To foster aquaculture industry development, the Task Force suggested that it is imperative to develop more incentives in the form of tax relief, credit and loan programs, and grants for entrepreneurial farmers, as well as large-scale operations.[131] Further, as "regulator of the aquaculture industry, [the] DMR is not the appropriate agency to lead economic development and promotion activities for the aquaculture industry."[132] The Task Force, therefore, determined that the Department of Economic and Community Development (DECD) should have primary responsibility for the business, scientific, and technology programs. Specifically, the DECD should:

> [L]ink[] aquaculture entrepreneurs to existing small business services and training programs[;] [p]rovide[] matching funds to entrepreneurs to allow them to attend conferences, visit aquaculture sites in other parts of the world and get training in culture methods[;] [e]xplor[e] the concept of developing "Lighthouse Zones," meaning specific tax incentives or tax credits for those investing in aquaculture; and [p]rovide micro-loans or grants to stimulate entry into the business and support start up companies.[133]

Thus, the Task Force advocated for more innovation in the business sector, as most of the State's efforts have been in promoting and creating the regulatory framework for the application and leasing process.

E. Gulf of Maine: Ecosystem-Based Management and Zoning Initiative

As previously mentioned, comprehensive marine zoning is a spatially explicit management approach that depends on the understanding of the

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128. *Id.*
129. *Id.* at 80.
130. *Id.*
131. *Id.* at 81.
132. *Id.* at 82.
133. *Id.* at 83-84.

entire seascape, including all marine resources and resource users.[134] Marine zoning is not a new concept, as the marine environment has long been zoned for many purposes, an example of which includes navigational shipping lanes.[135] However, using zoning as a management tool to conserve areas and to reduce conflicts among resource users is a much more complicated process that first involves seafloor mapping.

The Gulf of Maine Mapping Institute (GOMMI) has undertaken the arduous task of mapping the entire seafloor of the Gulf of Maine basin using technology such as multi-beam sonar and laser scanning.[136] The goal of this initiative is to produce a topographic map of the seafloor, as well as a map of bottom composition, including data as to whether the seafloor is composed of gravel, mud, or rock. Already, 15% (168,000 square kilometers) of the Gulf of Maine has been mapped by Maine and Canadian agencies, with support contributed by the U.S. federal government. The purpose of obtaining a seafloor map is to generate a basic, holistic understanding of the Gulf of Maine ecosystem, which is useful in spatially designating zones for MPAs and other uses. [137]

Maine has undertaken the zoning and mapping initiatives in conducting several pilot projects, including bay management studies in Muscongus and Taunton Bays. The pilot projects are defined as "microcosms for ecosystem-based management."[138] These small-scale studies revealed what environmental and biological parameters should be considered in conducting large-scale, regional studies for ecosystem-based management.

IV. IMPROVING THE NATIONAL OFFSHORE AQUACULTURE ACT OF 2007

There are many positive aspects of the most recently proposed version of the National Offshore Aquaculture Act. It is a direct response to the alarming trend in increased foreign seafood imports in light of a general rise in domestic seafood consumption. It is also commendable that politicians,

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134. COURTNEY & WIGGIN, *supra* note 42, at 19. An example of one effort to achieve such an approach is the Gulf of Maine Mapping Institute (GOMMI), a U.S./Canadian partnership formed by The Gulf of Maine Council for the Marine Environment and composed of government and non-government organizations. The Council's objectives were set out in a recent report. *See* GULF OF MAINE COUNCIL ON THE MARINE ENVIRONMENT ACTION PLAN 2007-2012 11, *available at* http://www.gulfofmaine.org/actionplan/GOMC%20Action%20Plan%202007-2012.pdf.

135. COURTNEY & WIGGIN, *supra* note 42, at 8.

136. *Id.* at 23.

137. *Id.*

138. Peter Taylor, *Test Tubes for Ecosystem-Based Management,* 10 GULF OF MAINE TIMES (2006), *available at* http://www.gulfofmaine.org/times/fall2006/scienceinsights.html.

such as Senators Stevens, Inouye, and Snowe, are spearheading the movement to gain support for this Act and a successful offshore framework. Further, it is encouraging that Senate hearing testimony from members of the aquaculture industry (e.g., Sebastian Belle) was considered in an effort to improve the Act of 2005. Finally, while the Act of 2005 did not succeed in the 109th Congress, the recent presentation of the revised Act to the 110th Congress may be an indication that support for an offshore framework is gaining momentum, and congressional action is imminent.

The improvements to the Act of 2005 incorporated into the Act of 2007 are significant because the revisions incorporate additional provisions to address conflicting uses in the EEZ. Specifically, the Act of 2007 added a provision that addressed a State's right to opt out of offshore aquaculture within its territorial sea, out to the twelve nautical mile limit.[139] The Act of 2007 also goes further with compliance requirements, as the Secretary must seek compliance with other federal agencies, the CZMA and OSCLA, the States, and the regional fishery management councils that were created by the Magnuson-Stevens Act.[140]

Further, the Act of 2007 also increases the duration of permits from ten to twenty years and increases the duration of lease renewal periods in increments up to twenty years.[141] This is a direct response to industry members who voiced criticism to the ten-year lease duration at the Senate hearings, expressing that this was too short a time frame to realize profits from an already risky investment. Although the Act of 2005 required the applicant to receive both an operation and site permit, the Act of 2007 streamlines the process so the applicant only has to receive one permit, which reduces administrative burdens on the Secretary and on the applicant.[142]

Finally, another significant improvement to the Act of 2007 is the addition of specific language regarding environmental impacts and monitoring. Specifically, the Act of 2007 provides that the Secretary cannot issue a permit if there is a potential impact on natural fish stocks, any risk in spread of disease or escaped transgenic fish, or a negative impact on water quality.[143] In addition, the Act of 2007 also provided that the Secretary must comply with NEPA in obtaining an EIS or an EA.[144]

Although the Act of 2007 incorporated a variety of positive improvements to the Act of 2005, there is still a need for additional improvements.

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139. H.R. 2010, 110th Cong. § 4(d)(2) (2007).
140. *Id.* § 4(d)(1).
141. *Id.* § 4(b)(2)(C).
142. *Id.* § 4(b).
143. *Id.* § 4(a)(4)(A)-(B).
144. *Id.* § 4(a)(2).

Maine's aquaculture laws and regulations, as well as ecosystem-based management initiatives, provide an example of a successful legal and policy framework that should be considered when making improvements to the Act. The Act of 2007 shares some similarities with the Maine framework, including the creation of a centralized regulatory framework, with exclusive administrative authority vesting in the Secretary of Commerce and the Commissioner of the DMR, respectively. Further, this centralization is evident in the grants of rulemaking authority to both the Secretary and Commissioner.

Generating additional improvements to the permitting section[145] of the Act of 2007 is necessary. Even though there is only one permit required and the lease duration has been increased, there is no language in the Act regarding facility acreage limit. In Maine, the legislature recently increased the statutory limit for a single lease to 1,000 acres.[146] Further, the Maine statute limits a single lessee to an aggregate leasehold of no more than 300 acres, with the Task Force recommending this acreage cap be raised to 500 acres.[147] Even though offshore aquaculture is new and in an experimental phase, the Act of 2007 should incorporate an acreage limit per facility, or in the alternative, the Act should propose an aggregate acreage limitation. Establishing acreage limitations will help to reduce user conflicts in the EEZ, and will enable both small entrepreneurs and corporations to obtain access to ocean space. Further, establishing an acreage limitation and an acreage cap is more consistent with the fact that the EEZ is held by the public in common, and no individual or entity should be given a greater proprietary interest than is reasonably necessary.

Even though the Act of 2007 addresses compatibility with other marine resource users,[148] in that the Secretary must consult with other federal agencies, states, and fishery management councils prior to issuing a permit, this is relatively vague language. Although broad statutory language is a benefit in that it provides for flexibility in consultations with user groups, there needs to be explicit safeguards for commercial fishermen. Even though the Act provides that the Secretary must consult with regional fishery management councils, a comprehensive dialogue between council members, commercial fishermen, and scientists is necessary to ensure that fishermen are not displaced from viable fishing grounds. Commercial fishermen in Maine expressed their concern to the Task Force, and recommended that site reviews for aquaculture facilities be conducted when

145. *Id.* § 4(b).
146. 13-188 ME. CODE R. § 2.12(3).
147. 12 M.R.S.A. § 6072(2).
148. H.R. 2010 § 4(d).

the fishery potential is at its peak.[149] Thus, when the Secretary is conducting a site review, or an EIS and EA, the review should occur when fish stocks are at their greatest potential in an area.

Although the Act of 2007 provides a more streamlined permitting process, as contrasted with the Act of 2005, the Act could be improved by including provisions that reflect Maine's statutes regarding limited purpose leases and licenses. In Maine, limited purpose leases are designated for commercial and scientific purposes, have smaller acreage limits and terms, and provide small entities or entrepreneurs the chance to determine whether to apply for a standard lease.[150] Further, Maine offers limited-purpose aquaculture licenses, which provide entrepreneurs with a chance to experiment with different propagated species, as well as test gear types and locations.[151] Small ventures and entrepreneurs who are interested in obtaining an offshore facility permit should be provided the opportunity to first obtain a limited-purpose license or lease, which would reduce capitalization and investment risks. Businesses and investors may be reluctant to enter the offshore industry without the ability to experiment with propagated species and gear at particular locations before applying for a permit.

As an extension to the limited-purpose leases and licenses, it is necessary to consider financial incentives for offshore facility entrepreneurs. The Maine Task Force recommended that the Legislature create tax relief incentives for coastal farmers, such as "Lighthouse Zones," or credit and loan programs.[152] There should be a similar financial incentive program for offshore entrepreneurs, as aquaculture is not a cottage industry.[153] Given the high economic risks of an offshore venture and the vast expense of building the infrastructure for an offshore facility, prospective investors may be reluctant to enter the industry without tax incentives. Even though the Secretary has appropriated over $4 million in the fiscal year 2008 for the purpose of carrying out the Act of 2007,[154] an economic incentive program needs to be established to encourage entities and entrepreneurs to enter the offshore industry. To accomplish this task, the Secretary will have to collaborate with another department to implement an economic scheme.

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149. TASK FORCE, *supra* note 104, at 63.

150. 12 M.R.S.A. § 6072-A.

151. 12 M.R.S.A. § 6072-C.

152. TASK FORCE, *supra* note 104, at 84.

153. A cottage industry is defined as, "an industry whose labor force consists of family units or individuals working at home with their own equipment." Merriam-Webster online dictionary, http://www.meriamwebster.com/dictionary/cottage%20industry (last visited Oct. 11, 2007).

154. H.R. 2010 § 7.

Finally, ecosystem-based management approaches, such as zoning, should be considered when re-drafting the Act of 2007. Piece-meal zoning initiatives have already been implemented in the EEZ, such as in the creation of MPAs and designating shipping lanes for navigational purposes. In March 2005, the U.S. Commission on Ocean Policy and the Pew Oceans Commission called for an ecosystem-based management approach in generating future ocean policies.[155] In making improvements to the Act of 2007, therefore, an ecosystem-based management approach should be considered in designing an offshore aquaculture framework. The Act should consider spatial designation of areas for offshore facilities through zoning. As the GOMMI example illustrated, mapping bottom or benthic habitats over large areas is an arduous task. The benefits of spatial zoning, however, would include reducing conflicts with existing resource users, as well as allocating space for new research and development activities. The Act already provides that a navigational safety zone should be established by the Coast Guard around each offshore facility.[156] Policy makers should consider a zoning plan that would confine other offshore facilities to different zones.

V. CONCLUSION

The National Offshore Aquaculture Act of 2007 is a vast improvement to the prototype presented to Congress in 2005. There are, however, numerous statutory improvements and policy considerations that could improve the proposed offshore framework. The State of Maine's laws, regulations, and policy initiatives can provide further guidance in fine-tuning the Act of 2007. Although further revisions and an ecosystem-based management approach through zoning seem like arduous tasks, it is important to realize that foreign nations, such as Australia, have already implemented an offshore framework, complete with ocean zoning. If foreign nations and coastal states can implement successful aquaculture industries and zoning initiatives, the U.S. government can certainly provide a similar offshore framework—one that is both sustainable and economically successful. With persistence and motivated politicians leading the initiative in Congress, a successful, workable framework can be established, and the United States can generate seafood for domestic consumption, while simultaneously decreasing imports from non-sustainable foreign nations and improving its balance of trade.

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155. *See* Scientific Consensus Statement on Marine Ecosystem-Based Management, http://compassonline.org/?q=EBM (last visited Oct. 11, 2007).

156. H.R. 2010 § 4(d)(6).