# TURNING THE TIDE: DEVELOPING A VIABLE AQUACULTURE INDUSTRY IN THE UNITED STATES EXCLUSIVE ECONOMIC ZONE

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## I. INTRODUCTION

The ocean has provided humanity with food for thousands of years, and many civilizations have fulfilled a majority or an entirety of their nutritional needs

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on its bounty.[1] In the past, simple methods were used such as spear fishing, a hook and line, or basic nets. In the modern era, countries have the option and ability to employ a much more complex method that yields higher amounts of products—aquaculture.

Aquaculture is defined federally as "the propagation and rearing of aquatic species in controlled or selective environments."[2] It is the solution to a myriad of economic, environmental, and social issues that plague the United States, which is a nation "highly dependent on fishery imports to satisfy [its] domestic consumption."[3] Aquaculture, if implemented on a large scale in the United States, could relieve the intense pressure on marine fisheries, which have seen a reduction in sustainability since 1974.[4] There are valid concerns aquaculture itself can propagate environmental problems, such as "water pollution due to discharges of excess feed, wastes, parasiticides, and other chemicals; and impacts to protected species and wild stocks due to naturalization of escaped stocks or disease transmission."[5]

These concerns are legitimized by an increasing reliance on aquaculture over wild caught fish.[6] In 2014, the global consumption of fish products from aquaculture surpassed that of wild fish, in large part due to China's massive operations, which constitute "60 percent of world aquaculture production."[7] While China and the rest of the world have begun to maximize their economic interests through the development of large-scale aquaculture, the United States lags behind, it suffering an "annual trade deficit for seafood, which surpassed 14 billion dollars in 2016."[8] As the demand for fish increases with the growth of the global

1. Austl. Nat'l Univ., *Gone fishing? We have for 42,000 years,* PHYS.ORG (Nov. 25, 2011), https://phys.org/news/2011-11-prehistoric-mastered-deep-sea-fishing.html [https://perma.cc/7R2P-PVXQ].

2. National Aquaculture Act of 1980, 16 U.S.C. § 2802 (2020).

3. FOOD & AGRIC. ORG. OF THE UNITED NATIONS, THE STATE OF WORLD FISHERIES AND AQUACULTURE: CONTRIBUTING TO FOOD SECURITY AND NUTRITION FOR ALL 54 (2016), http://www.fao.org/3/a-i5555e.pdf [https://perma.cc/D9BB-L4BT] [hereinafter FOOD AND AGRIC. ORG. OF THE UNITED NATIONS (2016)].

4. *Id.* at 5.

5. Read Porter & Rebecca Kihslinger, *Federal Environmental Permitting of Offshore Aquaculture: Coverage and Challenges*, 45 ENV'T. L. REP. NEWS & ANALYSIS 10875, 10875 (2015).

6. *See* FOOD & AGRIC. ORG. OF THE UNITED NATIONS (2016), *supra* note 3, at 2.

7. *Id.*

8. Colby Stewart, *A Current Affair: Ensuring Sustainable Aquaculture in the U.S. Exclusive Economic Zone*, 20 VT. J. ENV'T L. 70, 71 (2019).

population, the lucrativeness and necessity of expansive aquaculture in the United States becomes more apparent.[9]

Aquaculture in the United States has the potential to be profitable; however, a viable, comprehensive regulatory framework stimulating the creation of a globally competitive aquaculture industry is nonexistent.[10] The location with the most potential for large scale aquaculture is the Exclusive Economic Zone (EEZ), which extends to a maximum of 200 nautical miles from the territorial sea baseline.[11] The inner limit of the zone is three nautical miles from the boundaries of coastal states, and nine nautical miles from Texas, western Florida, and Puerto Rico.[12] The EEZ remains largely undeveloped in terms of aquaculture due to burdensome federal environmental laws, federal agencies with overlapping jurisdiction, and a lack of legal clarity regarding the development of a commercial aquaculture operation.[13]

This Note will first evaluate the global and national demand for fish products, which continues to grow every year, and why there is a need for aquaculture to maintain the sustainability of wild fish populations. Additionally, the economic value of aquaculture in terms of reducing the United States trade deficit and providing a cheap source of protein will be analyzed. Next, this Note will discuss the potential environmental harms aquaculture can introduce, such as bio waste, cross breeding of wild and farmed fish, and propagation of disease. The legal framework governing commercial aquaculture will then be examined to shed light on the difficulties impeding development of commercial aquaculture in the EEZ. Finally, this Note will conclude with legislative and administrative changes that should be made to promote large-scale aquaculture in the EEZ.

### *A. Aquaculture Benefits*

Aquaculture is an industry needed both globally and in the United States. To develop a successful aquaculture operation, the public and lawmakers must be aware of (1) the global decline of fisheries, (2) the relief aquaculture provides wild aquatic populations, (3) the economic potential of this ripe industry, and (4) the potential environmental harm produced by mismanaged aquaculture operations.

9. *See id.*

10. *See* Brandee Ketchum, *Splitting Scales: Conflicting National and Regional Attempts to Manage Aquaculture in the Exclusive Economic Zone*, 6 J. FOOD L. & POL'Y 4, 30 (2010).

11. Nat'l Oceanic & Atmospheric Admin., *What is the EEZ?*, NAT'L OCEAN SERV. (Dec. 30, 2020, 9:25 AM), https://oceanservice.noaa.gov/facts/eez.html [https://perma.cc/LX4S-XYTR] [hereinafter Nat'l Oceanic & Atmospheric Admin.].

12. *Id.*

13. *See* Ketchum, *supra* note 10.

*1. Global Decline of Fisheries*

The Food and Agriculture Organization of the United Nations (FAO) publishes data on the consumption, trade, market value, and development of aquaculture globally.[14] The FAO is a specialized agency within the United Nations tasked with eliminating hunger and improving nutrition globally through the promotion of productive agricultural activity, such as aquaculture.[15] The world's marine fisheries have begun to decline in production from 86.4 million tons in 1996 to 80.9 million tons in 2013.[16] Additionally, "31.4 percent of fish stocks were estimated as fished at a biologically unsustainable level and therefore overfished."[17] Not surprisingly, it is large industrial countries that have contributed most to the decline of global fish populations.[18] China reels in nearly 14 million tons of fish every year.[19] Exacerbating the problem, "[t]he share of the world fish production utilized for direct human consumption has increased significantly in recent decades . . . [to] more than 146 million tonnes, in 2014."[20] The FAO evaluates sustainability based on a maximum sustainable yield policy developed by the UN Fish and Stocks Agreement and the FAO Code of Conduct.[21] This analysis measures the mortality rate of the fisheries, and if it rises to a certain threshold the fisheries will be deemed unsustainable.[22] For example, in the Northwest Atlantic, Greenland halibut, yellow tail flounder, and spiny dogfish were categorized as overfished.[23] Additionally, "[t]he Mediterranean and Black Sea has seen its catch decline from 2.0 million tonnes in 1982 to 1.2 million tonnes in 2013. . . . [and] had 59 percent of assessed stocks fished at biologically unsustainable levels . . . ."[24]

14. *See About FAO*, FOOD & AGRIC. ORG. OF THE UNITED NATIONS (Jan. 20, 2021 10:39 AM) http://www.fao.org/about/en/ [https://perma.cc/Q2H3-AW3L].

15. *See id.*

16. FOOD & AGRIC. ORG. OF THE UNITED NATIONS (2016), *supra* note 3, at 38.

17. *Id.*

18. *See The Future of Fish – The Fisheries of the Future*, WORLD OCEAN REV. (2013), https://worldoceanreview.com/en/wor-2/fisheries/state-of-fisheries-worldwide/ [https://perma.cc/99H4-TT82].

19. *Id.*

20. FOOD & AGRIC. ORG. OF THE UNITED NATIONS (2016), *supra* note 3, at 6.

21. *Id.* at 40.

22. *Id.*

23. *Id.* at 43.

24. *Id.*

*2. Wild Fish Populations are Relieved of Overfishing*

Aquaculture can provide relief to these wild populations by meeting the global fish demand with farmed fish rather than wild populations.[25] Fortunately, the consumption of farmed fish rather than wild fish has been on the rise. In 2016, "aquaculture accounted for 17 to 18 percent of total fish production in Africa, the Americas and Europe."[26] Furthermore, the FAO reported 37 countries have replaced more than half of their fish production with aquaculture.[27] If these numbers continue to grow and the sophistication of aquaculture continues, fish stocks worldwide may see their numbers increase dramatically.

*3. Economic Benefits*

As previously mentioned, the demand for fish is being met by aquaculture, which has provided employment, food, and income for many worldwide.[28] According to the FAO 2016 report, fish harvested from aquaculture "in 2014 amounted to 73.8 million tonnes, with an estimated first-sale value of US $160.2 billion."[29] This industry is also steadily rising with aquaculture increasing its yield to 46.8% of all captured fish, up from 12.7% in 2000.[30]

Not only does aquaculture provide food and a stable profit, but it also provides jobs to millions of people around the world. Accordingly, an estimated 59.6 million people were employed in some way involving aquaculture in 2016.[31] As aquaculture continues to grow as an industry, more people will likely find employment. Successful aquaculture operations can provide food and financial security to the United States. The wide variety of benefits from aquaculture make it clear the development of this industry can relieve a multitude of problems, such as overfishing, poverty, and hunger.[32] Additionally, a strong national aquaculture program could lead to the creation of many jobs within the United States, ranging

25. Emily Folk, *What aquaculture could mean for fish populations*, ECOLOGIST (May 29, 2018), https://theecologist.org/2018/may/29/what-aquaculture-could-mean-fish-populations [https://perma.cc/372U-U8L9].

26. FOOD & AGRIC. ORG. OF THE UNITED NATIONS, THE STATE OF WORLD FISHERIES AND AQUACULTURE: MEETING THE SUSTAINABLE DEVELOPMENT GOALS 18 (2018), http://www.fao.org/3/i9540en/i9540en.pdf [https://perma.cc/W72J-N39Y] [hereinafter FOOD & AGRIC. ORG. OF THE UNITED NATIONS (2018)].

27. *Id.*

28. *See id.*

29. FOOD & AGRIC. ORG. OF THE UNITED NATIONS (2016), *supra* note 3, at 5.

30. *See* FOOD & AGRIC. ORG. OF THE UNITED NATIONS (2018), *supra* note 26, at 18.

31. *See id.* at 5.

32. *See* Sarah Ann Siedlak, *How Can States Outside the Gulf of Mexico Regulate Offshore Finfish Aquaculture?*, 67 CASE W. RSRV. L. REV. 1327, 1339 (2017).

from harvesting farmed fish to manufacturing the equipment, feed, and other materials necessary for such operations.[33] Since the United States has a vast EEZ, it has many available options when it comes to what types of offshore aquaculture operations it may undertake.[34]

To put this into perspective, in 2012 the United States "spent an estimated $82.6 billion on seafood, making the U.S. one of the top three seafood markets worldwide."[35] The United States only produces about 5% of the seafood it consumes, "creating a seafood trade deficit nearing $11 billion in 2012."[36] While the World Resource Institute predicts aquaculture production needs to double by 2050 to meet global demand, the growth and value of United States aquaculture has been far below the world average.[37] Global growth has been due in part to successful aquaculture regulatory schemes in countries such as "Japan, Korea, Ireland, Norway, China, and Spain."[38] Producing a similar regulatory framework has been of great interest to the National Oceanic and Atmospheric Administration (NOAA) in its effort to achieve the same aquaculture success as these other countries.[39]

The NOAA is a branch of the United States Department of Commerce, and it is one of several administrative agencies that may regulate aquaculture in the EEZ.[40] Their three main functions are: "1. [t]o understand and predict changes in climate, weather, oceans and coasts; 2. [t]o share that knowledge and information with others; and 3. [t]o conserve and manage coastal and marine ecosystems and resources."[41] The NOAA has taken a bold and correct stance towards aquaculture, recognizing its potential to "provide[] domestic jobs, products, and services . . . in

33. *Id.* at 1341.

34. *See* NAT'L OCEANIC & ATMOSPHERIC ADMIN., OFFSHORE AQUACULTURE IN THE UNITED STATES: *ECONOMIC CONSIDERATIONS, IMPLICATIONS & OPPORTUNITIES* 6 (Michael Rubino ed., 2008), https://spo.nmfs.noaa.gov/sites/default/files/tm103.pdf [https://perma.cc/25FF-C6SR].

35. Stewart, *supra* note 8, at 75.

36. NAT'L SCI. & TECH. COUNCIL COMM. ON SCI. INTERAGENCY WORKING GRP. ON AQUACULTURE, NATIONAL STRATEGIC PLAN FOR FEDERAL AQUACULTURE RESEARCH (2014-2019) 7 (June 2014), https://www.ars.usda.gov/SCA/Documents/National%20Strategic%20Plan%20for%20Federal%20Aquaculture%20Research%202014%20to%202019.pdf [https://perma.cc/9F4E-W8HJ].

37. *See* Stewart, *supra* note 8, at 75.

38. *Id.* at 76.

39. *See id.*

40. *See generally* 15 C.F.R. §§ 902-997 (2021).

41. *Our mission and vision*, NOAA (Jan 19, 2021, 3:19 PM), https://www.noaa.gov/our-mission-and-vision [https://perma.cc/V3LE-FJSF].

harmony with healthy, productive, and resilient marine ecosystems."[42] With the NOAA taking the lead for offshore aquaculture, the United States could improve its $1 billion aquaculture industry, which is presently quite weak considering the global aquaculture industry is worth $100 billion.[43]

*4. Potential Detrimental Effects*

Aquaculture is not without its risks, and the potential for catastrophic damage to the environment, wild fish populations, and human health are real.[44] "[B]ecause aquaculture takes place in moving water, [there is] a higher probability of 'inadvertent transmission and spread of wastes, diseases, and genetic material.'"[45] For example, when farmed fish are given feed, some of the foodstuff remains unconsumed and disperses itself into the local ecosystem.[46] When this feed escapes, it is incorporated into the ecosystem and may lead to phytoplankton blooms (red tides), production of pathogens, death of organisms, and foul odors.[47] Because of the presence of disease, aquaculture farmers often:

> [E]xpose their cultured organisms to medication regimes, for different purposes such as avoiding disease outbreaks and improving growth performance. However, monitoring studies have detected low or high levels of a wide range of pharmaceuticals, including hormones, steroids, antibiotics, and parasiticides, in soils, surface waters, and groundwaters. These chemicals have caused imbalances in the different ecosystems.[48]

The issues with aquaculture do not end there. Operating aquaculture in riverbeds can lead to the degradation of the local landscape, which detrimentally

42. *See* NAT'L OCEANIC & ATMOSPHERIC ADMIN., MARINE AQUACULTURE POLICY 1 (June 2011), https://media.fisheries.noaa.gov/dam-migration/2011_noaa_aquaculture_policy.pdf [https://perma.cc/4PDX-RPL3] [hereinafter NAT'L OCEANIC & ATMOSPHERIC ADMIN., MARINE AQUACULTURE POLICY].

43. *See* Kristen L. Johns, Note, *Farm Fishing Holes: Gaps in Federal Regulation of Offshore Aquaculture*, 86 S. CAL. L. REV. 681, 683 n.6 (2013).

44. *See* Ketchum, *supra* note 10, at 12-16.

45. *Id.* (quoting THE WORLD BANK, CHANGING THE FACE OF THE WATERS: THE PROMISE AND CHALLENGE OF SUSTAINABLE AQUACULTURE 15 (2007), https://openknowledge.worldbank.org/bitstream/handle/10986/6908/416940PAPER0Fa18082137015501PUBLIC1.pdf?sequence=1&isAllowed=y [https://perma.cc/6CGG-YBAS].

46. *See* Marcel Martinez-Porchas & Luis R. Martinez-Cordova, *World Aquaculture: Environmental Impacts and Troubleshooting Alternatives*, 2012 SCI. WORLD J. 1, 3 (Apr. 29, 2012).

47. *Id.*

48. *Id.*

impacts the ecosystems and weather local wildlife have adapted to.[49] Aquaculture may also inadvertently introduce species of fish or other wildlife to an ecosystem that is not prepared for the new organisms.[50] For example, in Ecuador, a group of farmed cobia fish escaped from a fish farm operation.[51] These fish move at a rate of 200 miles per month, and have the capacity to alter the gene pool or upset the balance of available food.[52] When fish escape from aquaculture enclosures, they may introduce genes that reduce the size of the native fish populations.[53] This decrease in size can result in lower rates of survival, lower populations, and possibly extinction.[54]

Aquaculture operations in coastal regions harboring mangrove forests have also negatively contributed to local fauna and ecological stability.[55] Many countries, including the Philippines and Indonesia, have removed parts of their mangrove forests in order to facilitate aquaculture.[56] Deforestation results in the loss of habitats for birds, reptiles, fish, and crustaceans, along with the destruction of valuable storm protection against winds and rising waters.[57] These forests may also prevent the erosion of the coastline, which protects people who make their homes near the coast.[58] According to some reports, aquaculture may be responsible for the decline of 19.8 million hectares of mangrove forest in 1980 to less than 15 million hectares in 2000.[59] Aquaculture has obvious and catastrophic risks that can affect human health, the environment, and ecological stability. This reflects the need for a strong, unambiguous regulatory framework that will simultaneously produce economic growth and opportunity, lower the overharvesting rate of wild-caught seafood, and minimize the various environmental risks that accompany any aquaculture operation.

49. *See id.*

50. *See* Kevin Keough et al., *The Impact of Aquaculture on the Environment*, DEBATING SCI. (Apr. 25, 2017), https://blogs.umass.edu/natsci397a-eross/the-impact-of-aquaculture-on-the-environment/ [https://perma.cc/93VS-SSGP].

51. *Id.*

52. *See id.*

53. *See* Siedlak, *supra* note 32, at 1337.

54. *See* Keough et al., *supra* note 50.

55. *See* Martinez-Porchas & Martinez-Cordova, *supra* note 46, at 2.

56. *Id.*

57. *See id.*

58. *See id.*

59. *See id.*

## II. AMBIGUOUS FRAMEWORK IMPEDES AQUACULTURE

With the benefits and detriments in mind, the United States must move forward in developing its own distinct and powerful aquaculture industry. Before this occurs, legislators need to simplify the "confusing patchwork of statutory and agency overlaps."[60] As mentioned previously, there is not a simplified federal regulatory framework allowing large-scale commercial aquaculture in the deep waters of the EEZ. The National Aquaculture Act of 1980 (NAA) served as a minor step towards the development of major aquaculture in the United States.[61] The NAA aptly noted decades ago "aquaculture currently contributes approximately 13 percent of world seafood production, [while] less than 6 percent of current United States seafood production results from aquaculture. Domestic aquaculture . . . has the potential for significant growth."[62] However, the effect of the NAA did not spur the United States towards the forefront of aquaculture in the EEZ. Rather, the NAA established that the Secretary of Commerce shall conduct studies on the adverse impact of aquaculture.[63] It also provided that various federal agencies may work together to study and assess the capability of the federal government to implement aquaculture.[64] However, it did not establish a strong and concise administrative power over aquaculture in a single agency or multiple agencies regulating in tandem.[65]

### *A. Magnusons-Stevens Act's Overlapping Grants of Authority*

The primary law governing the management of fisheries, and consequently aquaculture, is the Magnuson-Stevens Fishery Conservation and Management Act (MSA).[66] The purpose of this act is primarily threefold: (1) to conserve and maintain "finite but renewable" fishery resources, (2) to realize the full potential of the Nation's fishery resources, and (3) to establish Regional Fishery Management Councils.[67] The first two objectives are rather straightforward. These provisions were written with an express intent to maximize the vast aquatic resources available to the United States, and to simultaneously ensure the longevity

60. Garrett Wheeler, *A Feasible Alternative: The Legal Implications of Aquaculture in the United States and the Promise of Sustainable Urban Aquaculture Systems*, 6 GOLDEN GATE UNIV. ENV'T L. J. 295, 303 (2013).

61. *See* National Aquaculture Act of 1980, 16 U.S.C. § 2801 (2002).

62. *Id.*

63. *See* National Aquaculture Act of 1980, 16 U.S.C. § 2804(c)(1) (2002).

64. *Id* at § 2804(a).

65. *See id.*

66. *See* Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. § 1801 (2018).

67. *See id.* at (a)(5) & (b).

of these resources through a national program prioritizing conservation.[68] One of the more notable contributions of the MSA is the recognition of the EEZ as a classification of territory that modifies fishing rights.[69] With the passage of this statute, the federal government granted itself jurisdiction to regulate fishing activities in waters between three and 200, or nine and 200 miles off state coastlines.[70]

A crucial effect of this statute was the creation of Regional Fishery Councils with the authority to regulate fishery matters in their particular regions.[71] These Councils are granted the power to enforce and create Fishery Management Plans (FMPs) that: (1) enable states to participate, advise on, and establish the administration of such plans; and (2) take into account the economic needs of the state.[72] The National Marine Fishery Service (NMFS) may approve or deny any FMP based on its compliance with the MSA.[73] The MSA also grants authority to the NOAA to administer the provisions of the Act, and the NOAA passed this authority to the NMFS.[74] This clear grant of regulatory power would seem to encompass all aquaculture activity in the EEZ under the jurisdiction of NOAA and NMFS, as it is the "[NOAA's] and NMFS' responsibility as experts in fisheries to oversee aquaculture's impact on the marine environment" under the MSA.[75]

To solidify their administrative authority, NOAA adopted their Marine Aquaculture Policy of 2011, which outlined their basis for jurisdiction over aquaculture and the objectives of their governance.[76] In the policy, NOAA claims the MSA, the Conservation and Management Act, and the Endangered Species Act, among others, as basis to their authority.[77] Importantly, "NOAA may engage in regulatory actions in the Exclusive Economic Zone under the authority of the Magnuson-Stevens Fishery Conservation and Management Act . . ."[78] This

68. *See id.*

69. *See id.* at (b)(1).

70. *See id.*; *see also* Proclamation No. 5030, 48 Fed. Reg. 10605 (Mar. 10, 1983).

71. Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. § 1801(b)(5) (2018).

72. *Id.*

73. Erin R. Englebrecht, *Can Aquaculture Continue to Circumvent the Regulatory Net of the Magnuson-Stevens Fishery Conservation and Management Act?*, 51 EMORY L. J. 1187, 1208 (2002).

74. *Id.*

75. Johns, *supra* note 43, at 707.

76. *See* NAT'L OCEANIC & ATMOSPHERIC ADMIN., MARINE AQUACULTURE POLICY, *supra* note 42.

77. *See id.* at 3.

78. *Id.*

authority has not gone unchallenged. Just two years prior, "NOAA allowed the Gulf of Mexico Regional Fishery Council to amend its FMP to permit commercial aquaculture in its region's federal waters."[79] In response, plaintiffs Gulf Restoration Network, Inc., Food & Water Watch, and Ocean Conservancy brought a claim against NMFS alleging a violation of the MSA, Conservation Management Act, and the National Environmental Policy Act.[80] The court reiterates in this case that:

> The Department of Commerce, through NMFS, regulates the nation's marine fisheries, pursuant to the MSA. The MSA establishes eight Regional Fishery Management Councils composed of federal officials, state officials, and private parties that are appointed by the Secretary of Commerce. These Councils are responsible for developing fishery management plans . . . for fisheries in federal waters within the United States Exclusive Economic Zone . . . which includes ocean water from three to two hundred miles offshore.[81]

This case is illuminating because it discusses how citizens can engage in aquaculture.[82] The court explains that (1) an aquaculture permit is required for conducting offshore marine aquaculture and (2) application and information requirements are needed before a permit will be issued.[83] These elements are just the beginning.[84] Before an application to conduct aquaculture is approved, a Regional Administrator of NMFS must review and approve the application after publishing it in the Federal Register *and* notifying NOAA of intent to grant the permit.[85]

The burden of participating in aquaculture is shown by the facts in the case.[86] The court notes "the EPA and Army Corps of Engineers . . . have some responsibility over permitting offshore aquaculture."[87] As if obtaining a permit through the bureaucratic web of NMFS was not enough, if an applicant wants to construct an aquaculture facility they must also obtain a permit from the United States Army Corps of Engineers (USACE) pursuant to the Rivers and Harbor

79. Johns, *supra* note 43, at 708.

80. Gulf Restoration Network, Inc. v. Nat'l Marine Fisheries, Serv., 730 F. Supp. 2d 157, 159 (D.D.C. 2010).

81. *Id.* at 159-60 (internal citations omitted).

82. *See id.* at 162.

83. *See id.* at 161-62.

84. *See id.* at 161.

85. *See id.*

86. *See id.* at 160-63.

87. *Id.* at 162.

Act.[88] This act states that it shall be unlawful to build any structure in any water of the United States unless authorized by USACE.[89] The web has still not been completely unraveled, as "the EPA has the authority to grant or deny discharge permits for aquaculture operations" pursuant to the Clean Water Act (CWA).[90]

In the case at hand, the Gulf Fishery Council submitted an FMP to the NMFS that would establish aquaculture in the Gulf of Mexico.[91] The NMFS approved the FMP but did so without following its normal procedure for reviewing FMPs under the MSA.[92] The court ultimately dismissed the case—partly because the plaintiffs lacked standing.[93] While aquaculture had been authorized in the Gulf under the FMP, no action had actually taken place, so the plaintiffs could not show any injury.[94]

More importantly, the case discusses the application of federal law to aquaculture operations. Standing in the way of employment, economic growth, and a cheap, dependable source of protein was an amalgamation of federal agencies.[95] The USACE, EPA, NMFS, NOAA, and Fishery Management Councils all have jurisdiction to deny a permit to conduct aquaculture.[96] While it is understandable multiple agencies would have jurisdiction over complex operations like aquaculture, the facts of this case show the process of developing aquaculture needs to be simplified.[97] Navigating through multiple administrative permit processes reduces the economic viability of aquaculture, for each permit process raises the potential liability of investors or developers.

### *B. Environmental Protection Agency's Jurisdictional Deficiencies*

*Gulf Restoration Network Incorporated v. National Marine Fisheries* demonstrates the EPA's jurisdiction over aquaculture pursuant to the CWA, and that the EPA may approve or deny permits to participate in aquaculture operations.[98] However, the EPA is not as effective at regulating aquaculture as it

88. *Id.* (citing 33 U.S.C. § 403).
89. *See* 33 U.S.C. § 403.
90. *Gulf Restoration Network, Inc.*, 730 F. Supp. 2d at 162 (citing 33 U.S.C. § 1328).
91. *See id.*
92. *Id.*
93. *See id.* at 165.
94. *See id.* at 167.
95. *See id.* at 160-62.
96. *Id.*
97. *See generally id.*
98. *See id.* at 162.

should be.[99] United States aquaculture came under attack eight years prior in *United States Public Interest Research Group v. Atlantic Salmon of Maine, LLC* when a public interest group brought suit against an aquaculture farmer for violating the CWA.[100] This case also describes the legal tests the EPA uses when evaluating aquaculture facilities.[101]

In 1989, the EPA noticed certain salmon farms, consisting of sea cages and under the ownership of Atlantic Salmon of Maine, LLC, would require permits under the National Pollutant Discharge Elimination System (NPDES) program.[102] The NPDES program, under the authority of the CWA and administered by the EPA, states that concentrated aquatic production facilities are "point sources" subject to the NPDES permit program.[103] A concentrated aquatic animal production facility includes fish farms (salmon in sea cages), and if the Director of the EPA decides the concentrated aquatic production facility is "a *significant contributor* of pollution to waters of the United States," the Director may require the facility to be regulated under the permit program.[104] The factors the Director uses include "(i) [t]he location and quality of the waters of the United States; (ii) [t]he holding, feeding, and production capacities of the facility, [and] (iii) [t]he quantity and nature of the pollutants reaching [the] waters of the United States."[105] Atlantic Salmon of Maine acquired an NPDES permit for some of its aquaculture facilities, but it failed to acquire a permit for its salmon farms in Maine—a failure that gave rise to United States Public Interest Research Group's claim it had violated the CWA.[106]

To further illuminate how the EPA has jurisdiction over aquaculture, the court in *Atlantic Salmon of Maine* stated that under the CWA, the "discharge of any pollutant by any person is unlawful," and the discharge of pollutants may only be allowed if a NPDES permit is issued from the EPA.[107] The court also held fish farms fall under the scope of the CWA and biological waste from fish is classified

99. *See generally* United States Pub. Int. Rsch. Grp. v. Atl. Salmon of Me., 215 F. Supp. 2d 239, 241 (D. Me. 2002).

100. *Id.*

101. *See id.* at 245-57.

102. *Id.* at 244-45 (citing 40 C.F.R. § 122.24 (2021)).

103. 40 C.F.R. § 122.24(a) (2021).

104. *Id.* at (c)(1) (emphasis added).

105. *Id.*

106. *See United States Pub. Int. Rsch. Grp.*, 215 F. Supp. 2d at 247.

107. *Id.* at 245-246 (citing 33 U.S.C. §§ 1311(a), 1342(a)(1) & (k).

as a pollutant.[108] Fish farms are "point sources" which are confined and discrete conveyances from which pollutants are discharged.[109]

Regardless of this case and the EPA's authority under the CWA, the agency fails to provide a framework for development in the EEZ.[110] Because the CWA only authorizes the EPA to regulate the discharge of pollutants in navigable waters, which only includes interstate waters and intrastate lakes and rivers, offshore aquaculture operations would be beyond the reach of the EPA.[111] Though the EPA provided a rule that would extend the CWA's authority up to 12 miles offshore to concentrated aquatic animal production facilities, the EEZ zone extends up to 200 miles, which leaves plenty of space for developers to evade the EPA's reach.[112]

Another shortcoming of the EPA's authority is the CWA does not sufficiently address the issue of escaped aquaculture fish as a pollutant class.[113] The CWA defines pollutants as only including "dredged soil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water."[114] The court considered escaped salmon a pollutant, but other courts have made an exception to this rule.[115]

For instance, a Ninth Circuit opinion analyzing the CWA regulation of mussel harvesting facilities reached an entirely different conclusion than the court in *Atlantic Salmon of Maine.*[116] In *Association to Protect Hammersley, Eld, & Totten Inlets v. Taylor Resources, Incorporated*, the court applied the same test as in the previous case: (1) whether the aquaculture operation involving mussels was a "point source," and (2) whether the waste it produced should be categorized as a "pollutant," thereby requiring the defendant to acquire a NPDES permit.[117] The court found the pollutants discharged by the shellfish were not "biological

108. *See id.* at 247.

109. *See id.* at 255.

110. *See, e.g.*, Stewart, *supra* note 8, at 72.

111. Johns, *supra* note 43, at 703; *see also* 40 C.F.R. § 112.2 (2020).

112. *See* Nat'l Oceanic & Atmospheric Admin., *supra* note 11.

113. Stewart, *supra* note 8, at 81 (citing 33 U.S.C. § 1362(6) (2012)).

114. *Id.*

115. *See, e.g.*, United States Pub. Int. Rsch. Grp. v. Atl. Salmon of Me., 215 F. Supp. 2d 239, 247-48 (D. Me. 2002).

116. *See* Ass'n to Protect Hammersley, Eld, & Totten Inlets v. Taylor Res., Inc., 299 F.3d 1007, 1017 (9th Cir. 2002).

117. *See* Jeremy Firestone & Robert Barber, *Fish as Pollutants: Limitations and Crosscurrents in Law, Science, Management, and Policy*, 78 WASH. L. REV. 693, 727 (2003).

materials," and thus the language of the CWA did not apply to this shellfish aquaculture operation.[118] For clarification, the Ninth Circuit defined biological materials as the "waste product of a human or industrial process."[119] The court reasoned the term "biological materials" does not refer to naturally discharged materials from shellfish, unless these materials are "altered by a human or industrial process . . . [that] might affect the biological composition of the water."[120] The mussel growing facility was also not a point source or a place where pollutants were discharged from.[121]

Aquaculture facilities can be regulated by the EPA under the CWA if they are a '"concentrated aquatic animal products facility" that "grows or holds . . . '[c]old water fish species or other cold water aquatic animals . . . which discharge at least 30 days per year.'"[122] The court found the mussel harvesting facility was, by definition, an aquaculture facility under the EPA jurisdiction, but stated the facility was an exception to the rule because the defendant met the second exception of "'(1) [f]acilities which produce less than [approximately 20,000] pounds of aquatic animals per year; *and* (2) [f]acilities which feed less than [approximately 5,000 pounds] of food during the calendar month of maximum feeding'" will not fall under the definition of a point source.[123]

The EPA is an insufficient regulatory agency for aquaculture in the EEZ because it cannot provide broad enough protection against pollution and environmental harm within the entire nautical area of the EEZ. Under the CWA, the EPA can only regulate up to 12 miles offshore.[124] The cases above also show conflicting conclusions by the courts.[125] In *Atlantic Salmon of Maine,* the court aptly named the fish farm a point source that required permits to continue operating and found it could be regulated by the EPA.[126] However, in *Taylor Res., Inc*, the Ninth Circuit Court of Appeals found naturally occurring, but possibly environmentally hazardous, biological waste discharged by the aquaculture

118. *See Taylor Res., Inc.*, 299 F.3d at 1017.
119. *Id.* at 1017.
120. *Id.*
121. *See id.* at 1019.
122. *Id.* at 1018; *see also* 40 C.F.R. § 122.24(c) (2021).
123. *Taylor Res., Inc.*, 299 F.3d at 1017.
124. *See* Johns, *supra* note 43, at 703.
125. *See, e.g.*, *Taylor Res., Inc.*, 299 F.3d at 1019.
126. *See* United States Pub. Int. Rsch. Grp. v. Atl. Salmon of Me., 215 F. Supp. 2d 239, 247 (D. Me. 2002).

facility's mussels would not lead to a violation of the CWA, and allowed the EPA to regulate the facility.[127]

In addition to the case law, the EPA has not created a system allowing it to effectively monitor water quality standards for federal ocean waters (the EEZ).[128] The EPA operates the CWA by forming standards to judge the pollution levels of water, however, the EPA has not updated these standards since the 1980s.[129] Additionally, the EPA has not required permits for aquaculture facilities in the ocean, and without these permits, there is no federal agency evaluating the facility's "best practices, pollution limits, monitoring, and reporting [which] is a missed opportunity to monitor and minimize impacts on the environment and public health."[130]

This muddled group of decisions could confuse and discourage future investors of aquaculture in the EEZ. Any major producer of aquaculture who is risking significant capital to partake in this potentially profitable, yet uncertain industry, will want to know what result the law will likely reach. To achieve this, some scholars and politicians have noted that the best way to encourage development of aquaculture is to simplify the framework and grant a particular administrative agency hegemony over agencies when it comes to regulating aquaculture.[131]

## III. THE REMEDY TO AN AMBIGUOUS FRAMEWORK: CONSOLIDATION UNDER THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Aquaculture has the potential for growth in the United States, especially in the EEZ, where the borders of the United States provide miles of open water wherein efficient usage of resources—aquaculture in open water—can occur.[132] To facilitate aquaculture in the EEZ, the regulatory framework for federal waters should be simplified to address major environmental, economic, and health concerns. In 1999, the NMFS and the NOAA published a paper titled the *Code of*

127. *See Taylor Res., Inc.*, 299 F.3d at 1016-18.

128. *See* Jilian P. Fry et al., *Offshore Finfish Aquaculture in the United States: An Examination of Federal Laws That Could be Used to Address Environmental and Occupation Public Health Risks*, INT. J. ENV'T RSCH. PUB. HEALTH 11964, 11970 (2014).

129. *See id.*

130. *Id.*

131. *See generally* Johns, *supra* note 43 (discussing attempts by Congress and various groups such as the Pew Oceans Commission to simplify the regulation of aquaculture through legislation, funding, and studies from stakeholders, in addition to streamlining the permit system for aquaculture producers).

132. *See* Nat'l Oceanic & Atmospheric Admin., *supra* note 11.

*Conduct for Responsible Aquaculture Development in the U.S. EEZ* that addresses those three issues.[133] This report supports the consolidation of aquaculture under the leadership of NOAA and spells out the precise goals of an effective regulatory framework.[134] These goals include: (1) "[*p*]*romote the contribution of aquaculture to seafood supplies*," (2) "[*e*]*stablish principles for offshore aquaculture*," (3) "provide guidance to both the aquaculture industry and to those in government who must act on petitions to use the EEZ for aquaculture," and (4) "[*f*]*acilitate cooperation* . . . between parties with divergent opinions about offshore aquaculture" such as commercial fishermen."[135]

In addition to the four goals above, this paper outlines the five-year Fisheries Strategic Plan for Sustainable Fisheries (created by the NOAA), which proposes the following three-part strategy to develop aquaculture: (1) "[d]evelop and implement environmentally sound aquaculture technologies and practices," (2) "[p]romote the commercial rearing of at least seven species," and (3) "[i]dentify areas in coastal waters and the EEZ suitable for environmentally sound aquaculture development."[136] It was hoped that implementing these strategies would lead to "a fivefold increase in the value of domestic aquaculture production by the year 2025, and a threefold increase in employment [in aquaculture industries]."[137] It would seem this directive has failed, for, according to the NOAA, "90 percent of the seafood we eat comes from abroad, over half of it from aquaculture. Driven by imports, the U.S. seafood trade deficit has grown to $16.8 billion in 2017."[138] This lends proof to the contention that more work needs to be done in providing a regulatory framework facilitating large scale growth in the EEZ. To reduce the trade deficit of seafood products, the United States must look to open federal waters where "a wide variety of offshore ecosystems and species along the full

133. *See* NAT'L OCEANIC AND ATMOSPHERIC ADMIN., A CODE OF CONDUCT FOR RESPONSIBLE AQUACULTURE DEVELOPMENT IN THE U.S. EXCLUSIVE ECONOMIC ZONE 8 (1999), http://archive.gulfcouncil.org/docs/Code%20of%20Conduct%20for%20Responsible%20Aquaculture%20Development.pdf [https://perma.cc/7L78-G7DD] [hereinafter A CODE OF CONDUCT FOR RESPONSIBLE AQUACULTURE DEVELOPMENT].

134. *See id.*

135. *Id.* at 11.

136. *Id.* at 6.

137. *Id.*

138. *U.S. Aquaculture*, NOAA FISHERIES (June 19, 2020), https://www.fisheries.noaa.gov/national/aquaculture/us-aquaculture [https://perma.cc/UHQ7-Y7B4].

length of the Atlantic and Pacific coasts" can provide for large scale aquaculture development.[139]

### *A. Past Attempts to Consolidate Under the National Oceanic and Atmospheric Administration*

In 2009, legislation was introduced as the National Sustainable Offshore Aquaculture Act.[140] This bill was designed to "authorize[] aquaculture in federal waters, . . . [and] included binding environmental, socioeconomic, and liability standards."[141] The act ultimately failed in 2009 but was reintroduced in 2011.[142] What did these sections provide in further detail? The four stated purposes of the Act were:

> (1) To establish a regulatory system for sustainable offshore aquaculture in the United States exclusive economic zone. (2) To authorize the Secretary of Commerce to determine appropriate locations for, permit, regulate, monitor, and enforce offshore aquaculture in the exclusive economic zone. (3) To require the Secretary of Commerce to issue regulations for permitting of offshore aquaculture . . . [to] prevent impacts on the marine ecosystem and fisheries . . . . (4) To establish a research program to guide the precautionary development of offshore aquaculture in the [EEZ] . . . .[143]

The four purposes illustrate that Congress recognized a sufficient regulatory framework was needed to spur the development of a successful aquaculture industry in the United States. The bill also provided that "the Secretary [of Commerce] shall establish an Office of Sustainable Offshore Aquaculture within the National Marine Fisheries Service at National Oceanic and Atmospheric Administration headquarters," and this office shall "coordinate aquaculture and related issues within the National Oceanic and Atmospheric Administration."[144] This Act grants clear authority to NOAA as the administrator of aquaculture in the EEZ, and bolsters that authority through the establishment of advisory boards, whose members shall be appointed by the secretary.[145] These advisory boards

139. A CODE OF CONDUCT FOR RESPONSIBLE AQUACULTURE DEVELOPMENT IN THE U.S. EXCLUSIVE ECONOMIC ZONE, *supra* note 133, at 8-9.

140. National Sustainable Offshore Aquaculture Act of 2009, H.R. 4363, 111th Cong. (2009).

141. Johns, *supra* note 43, at 717.

142. *Id.* at 718.

143. National Sustainable Offshore Aquaculture Act of 2011, H.R. 2373, 112th Cong. § 2 (2011).

144. *Id.* at § 3(a).

145. *See id.* at § 3.

include "representatives from the National Marine Fisheries Service, the commercial and recreational fishing industries, State or local governments, . . . and representatives of the aquaculture industry" in order to provide a wide spectrum of perspectives to ensure the complexities of aquaculture are managed effectively.[146]

The revised 2011 bill accounted for numerous factors that could detrimentally affect wildlife by requiring stringent standards before an offshore aquaculture permit could be authorized.[147] Section 5 recognized the potential of gene pollution from farmed fish, and provided "[a]ll facilities and operations shall be designed, . . . to be effective at preventing the escape of cultured fish into the marine environment."[148] With respect to the potential for disease and pollution, the bill "require[d] offshore aquaculture facilities to be designed, located, and operated to prevent the . . . spread of disease and pathogens," and the Secretary shall "prohibit the use, including the prophylactic use, of antibiotics, pesticides, prescription and nonprescription drugs, . . . except that— (i) such use may be allowed as necessary to treat a diagnosed disease."[149]

The bill seemed to be thorough, sufficient, and mindful of possible complications that may arise from offshore aquaculture. Its purpose statement also appeared to be adequate to advance the United States towards becoming a more effective producer of aquaculture.[150] However, "[d]espite being endorsed by many environmental organizations, the National Sustainable Offshore Aquaculture bill died in the 112th Congress and was referred to the House Committee on Natural Resources, having received zero cosponsors."[151]

### *1. Fishery Management Plan for Regulating Offshore Aquaculture in the Gulf of Mexico*

In 2016, a final rule from NMFS and NOAA was implemented to "establish[] a comprehensive regulatory program for managing the development of an environmentally sound and economically sustainable aquaculture fishery" in the Gulf of Mexico and the Gulf EEZ.[152] The main purpose of this rule, which was sufficient given the economic needs stated above, "[was] to increase the yield of Federal Fisheries in the Gulf by supplementing the harvest of wild caught species

146. *Id.* at § 3(b)(2); *see also id.* at § 3(b)(5).

147. *See id.* at § 5.

148. *Id.* at § 5(j)(1)(F).

149. *Id.* at § 5(j)(2).

150. *See id.* at § 2.

151. Johns, *supra* note 43, at 720.

152. Fisheries of the Caribbean, Gulf, and South Atlantic; Aquaculture, 81 Fed. Reg. 1762, 1762 (Jan. 13, 2016) (to be codified at 50 C.F.R. pts. 600, 622).

with cultured product."[153] The most important section of this final rule described its authority to grant permits. Under Gulf Aquaculture Permits, the rule established you may conduct aquaculture activities in the Gulf EEZ with a valid permit, and you may sell the seafood products you produce.[154] These permits cost $10,000, must be renewed every five years, and a $1,000 fee is required annually.[155] Given the enormous economic potential of aquaculture, these fees are nominal.

To maintain the safety of the environment, the final rule requires permit holders to adhere to permit requirements. This includes "report[ing] to NMFS major escapement events; findings of reportable pathogens; and entanglements or interactions with marine mammals, protected species, or migratory birds."[156] The permit holders shall report any of the above events within a 24-hour period, and must report to the NMFS sufficient information about these events, such as the time and place of the event, the species of escaped fish, and steps taken to address the events.[157]

This final rule seemed to be a mark of progression towards developing a sufficient regulatory framework for aquaculture, at least in the Gulf EEZ. However, a federal district judge in *Gulf Fishermens Association v. National Marine Fisheries Service* found the National Marine Fisheries Service had "acted outside of its statutory authority" when it promulgated a final rule under the jurisdiction of the MSA.[158]

### *B. The Legislative Remedy: Advancing the Quality and Understanding of American Aquaculture Act*

The need for a comprehensive regulatory framework promoting investment and production in the EEZ drew the attention of Congress. On June 26, 2018, the Advancing the Quality and Understanding of American Aquaculture Act (AQUAA) was introduced to provide a comprehensive, nationwide permitting program for marine aquaculture facilities in the EEZ, and provide "[r]egulatory certainty and security of tenure. . . for business investment decisions about marine aquaculture."[159] Congress recognized a permissible framework did not exist for

153. *Id.*

154. *See id.* at 1788.

155. *Id.* at 1762.

156. *Id.* at 1766.

157. *See id.*

158. Gulf Fishermens Ass'n v. Nat'l Marine Fisheries Serv., 341 F.Supp.3d 632, 642 (E.D. La. 2018).

159. AQUAA Act, S. 3138, 115th Cong. § 2(a)(2)-(3) (2018).

aquaculture to thrive, and installing a framework is necessary for effective business decisions in the industry.[160]

The bill also tackled the issue of coordination amongst federal agencies demonstrated by the Interagency Working Group on Aquaculture (IWGA), "which was created by Congress in the National Aquaculture Act of 1980 (Public Law 96-362). [This group] is chaired by the Department of Agriculture, with vice-chairs from the Department of Commerce and the Department of Interior."[161] Before explaining the finer details of the framework, the bill outlined the goals of the legislation, which are markedly similar to the Code of Conduct paper produced by NMFS, stating the goals are:

> (1) to support the development of a sustainable marine aquaculture industry in the United States; (2) to safeguard the marine environment, wild fish stocks, . . . (4) to provide new jobs and to support existing jobs within the seafood industry . . . and (5) to reduce the United States seafood trade deficit by expanding the domestic supply of seafood."[162]

The environmental harm to fish stocks and other marine life and the desire to improve the economic condition of the United States aquaculture are key factors in any effective aquaculture legislation.[163]

The bill also provided a significant proposition: the establishment of the Office of Marine Aquaculture within NMFS at NOAA.[164] Some of the duties of the Office of Marine Aquaculture include: coordinating regulatory and scientific outreach; providing opportunities of engagement for fishery councils, state governments, and others; and organizing a network of federal agencies to provide technical expertise on marine aquaculture (aquaculture in the EEZ).[165] Next, the bill stated "[t]he [NOAA] shall serve as the lead Federal agency for purposes of providing information on Federal permitting requirements for marine aquaculture in State and Federal waters."[166] This would allow aquaculture business investors and owners to acquire the necessary legal information from one source, which would likely reduce costs and encourage the growth of commercial aquaculture projects.

160. *See generally id.*
161. *Id.* at § 2(a)(6).
162. *Id.* at § 2(b)(1)-(5).
163. *See generally* Johns, *supra* note 43, at 690-97.
164. AQUAA Act, S. 3138, 115th Cong. § 4(a) (2018).
165. *Id.* at § 4(b)(1)-(6).
166. *Id.* at § 5(a).

The bill aptly provided what regulatory powers NOAA—utilizing the Secretary of Marine Aquaculture—shall have, including:

> (A) procedures to issue, modify, deny, revoke, or suspend an offshore aquaculture permit; (B) procedures to coordinate the offshore aquaculture permitting process, with similar or complementary activities . . . (C) procedures to monitor and evaluate permit compliance; . . . (F) procedures to minimize, . . . conflicts with existing uses in the exclusive economic zone.[167]

Thus, the ability to issue permits would be consolidated within NOAA rather than amongst several overlapping agencies.[168] Additionally, this legislation had plain language regarding the monitoring, regulating, and legal authority to enforce compliance with any rules propagated by NOAA that cover aquaculture.[169] Last, these powers allowed NOAA to coordinate with other governments, such as state governments, that would inevitably come into conflict or require assistance regulating aquaculture in the EEZ, coastlines, or other areas.[170] This clear grant of authority, and what powers come with it, is exactly what the United States needs for a successful domestic aquaculture industry.

*1. Operation of Advancing the Quality and Understanding of American Aquaculture Act Permit Process*

AQUAA established that NOAA may issue permits for aquaculture facilities, but by what standards do they judge candidates for these permits? Section 6 of AQUAA stated:

> (1) the applicant [must] demonstrate[] that the offshore aquaculture facility will be—(A) maintained in good working order; and (B) operated and sited in a manner that minimizes adverse impacts on the marine environment; (2) the proposed offshore aquaculture facility is consistent with national policy goals and objectives, including sustainable and healthy fisheries, maritime shipping, and environmental quality.[171]

Contrast this with the current system, which may require an aquaculture producer to acquire a permit from the USACE, EPA, NMFS, the Coast Guard, and

167. *Id.* at § 5(c)(A)-(G).
168. *See id.*
169. *See id.* at § 5(c)(2).
170. *See id.* at § 5(c).
171. *Id.* at § 6(a).

other organizations.[172] AQUAA will not protect aquaculture developers from having to gain permits from other agencies because the NOAA permit will "not supersede or substitute for any other authorization required under Federal or State laws (including regulations)."[173] However, the Act would require "Federal agencies with permitting requirements applicable to offshore aquaculture facilities [to] coordinate all permitting activities with the Office of Marine Aquaculture."[174] This cooperation will lead to "[c]oordinating permit requirements, permit application and review procedures, . . . eliminating duplicative requirements, . . . [a]ligning permit application and review timelines."[175]

This bill offered legislation that would simplify the permit process, reduce regulatory overlap, establish more certainty for aquaculture producers and investors, and reduce overall costs of operating a facility in the EEZ.[176] These results would likely increase domestic aquaculture production in the United States, reduce the seafood trade deficit, and provide more employment opportunities for those who wish to participate in this industry.[177]

### *2. Advancing the Quality and Understanding of American Aquaculture Environmental Safeguards*

Given offshore aquaculture comes with inherent environmental risks such as "disease transfer to wild populations, invasive or genetically inferior species escapes, and additional stress on wild . . . fish populations," any effective legislation would provide safeguards against these risks.[178] AQUAA required the Secretary of Marine Aquaculture to consult appropriate federal agencies and state governments to mitigate risks to wild fish stocks, prevent transmission of diseases to fisheries, and prevent the escape of culture species that may cause environmental harm.[179] Additionally, the Act required NOAA to monitor the overall effects of aquaculture facilities on water quality from biological and chemical pollution, and to mitigate, minimize, or avoid these risks as much as reasonably possible.[180] The Act identified the risk offshore facilities pose to wild fisheries, but provided a

172. *See* Kelly B. Boden & Karen A. Mignone, *The Aquaculture Permitting Process in Federal Waters*, 45 No. 5 ABATRENDS 16, 17 (2014).

173. AQUAA Act, S. 3138, 115th Cong. § 6(l) (2018).

174. *Id.* at § 6(n)(3)(a).

175. *Id.*

176. *See generally* Stewart, *supra* note 8, at 76.

177. *See id.* at 74-75.

178. *See id.* at 76.

179. *See* AQUAA Act, S. 3138, 115th Cong. § 10(1)-(2) (2018).

180. *See id.* at § 10(2)(D)-(J).

sufficient safeguard to minimize the harm.[181] Though not completely preventative of all environmental harm, the Act moved in the right direction of identifying and reducing aquaculture risks in the EEZ.[182]

Last, the Act looks to the future by: establishing a research and grant program to monitor and address environmental effects; advancing research in disease management; and transiting to innovative technologies that allow aquaculture to facilitate the restoration of depleted species and habitats lost to overfishing.[183]

## IV. CONCLUSION

There is great potential for a powerful aquaculture industry in the United States due to the EEZ's many miles of coastline. There is a growing demand for seafood products, which has been met by foreign exports thus far. Many of these products come from the aquaculture operations of foreign nations such as China. Commercial aquaculture in the United States EEZ has been hampered by an uncertain regulatory framework that restricts economic development and discourages innovation. Through the introduction of AQUAA, Congress demonstrated its desire to for a viable regulatory framework.

The Act provided a strong framework for aquaculture to thrive in the EEZ. It has sufficiently identified the economic need for a larger offshore aquaculture industry in the United States, and set out a clear process to issue permits and satisfy this need. The Act also considered the inherent environmental risks within the industry, and made reasonable steps towards spotting these risks, addressing them (under the jurisdiction of the Office of Marine Aquaculture and NOAA in coordination with other applicable government agencies), and developing new methods to further reduce them. AQUAA, though a failed bill, is a sign Congress is at least aware that regulatory consolidation and simplification is required for the development of a viable aquaculture industry in the EEZ. There is still hope the tide can be turned, and the United States may one day advance to the forefront of the global aquaculture market.

181. *See id.* at § 10(2)(B)-(J).
182. *See id.* at § 10(2).
183. *See generally id.* at § 11(b)-(d).