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## Splitting Scales: Conflicting National and Regional Attempts to Manage Commercial Aquaculture in the Exclusive Economic Zone

Brandee Ketchum

*Preis & Roy, PLC, Lafayette*

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SPLITTING SCALES: CONFLICTING NATIONAL  
AND REGIONAL ATTEMPTS TO MANAGE  
COMMERCIAL AQUACULTURE IN THE  
EXCLUSIVE ECONOMIC ZONE

*Brandee Ketchum\**

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I. INTRODUCTION

Like other environmental resources subject to public use, various interest groups struggle over joint management of scarce fisheries resources. Further, differing goals for resource management, such as financial goals versus conservation goals, frequently pit regional groups against one another. In some cases, regional interests

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\* Associate Attorney, Preis & Roy, PLC. I would like to thank Kenneth Murchison, Louisiana State University Paul M. Herbert Law Center James E. & Betty Phillips Professor of Law, for his assistance with and invaluable insights into the preparation of this Article.

may conflict with overall national interests. As goes the water and the air, so go the fish.

Congress passed the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) in 1976 to address overfishing in the Nation's waterways.<sup>1</sup> Eight Regional Fishery Management Councils were given authority to manage fisheries in distinct geographic regions, with the instruction to "exercise sound judgment in the stewardship of fishery resources" through a cooperative of state and fishing industry representatives and environmental and consumer groups.<sup>2</sup> One such council is the Gulf of Mexico Fishery Management Council (GMFMC - the Council), which operates as a "quasi-federal entity" whose rules must be approved by the National Marine Fisheries Service (NMFS), the lead federal agency over fisheries and marine life within the National Oceanic and Atmospheric Administration (NOAA).<sup>3</sup> The Council includes representatives from Louisiana, Mississippi, Texas, Alabama, and Florida. Its primary function is to establish a Fishery Management Plan (FMP) that prevents overfishing in its regulatory geographic region, while maintaining the optimal yield of several varieties of marine life.<sup>4</sup>

Following enactment of the Magnuson-Stevens Act, the NOAA began a research and development program concerning "marine, estuarine, and anadromous species"<sup>5</sup> aquaculture, or fish farming.<sup>6</sup>

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1. 16 U.S.C.A. §§ 1801 *et seq.* (2007) amended by, Pub. L. No. 104-297, 110 Stat. 3559 (1996) (the Sustainable Fisheries Act of 1996) (2007). On Jan. 12, 2007, President Bush signed the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006, Pub. L. No. 109-479, 120 Stat. 3575 (2007), setting a firm deadline to end overfishing in America by 2011 and use "market-based incentives" to double the number of limited access privilege programs, which assign specific annual harvest quotas to eligible fishermen and regional fishery associations. WHITE HOUSE OFFICE OF THE PRESS SECRETARY, FACT SHEET: *MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT REAUTHORIZATION ACT* (Jan. 12, 2007), available at [www.whitehouse.gov/news/releases/2007](http://www.whitehouse.gov/news/releases/2007).

2. 16 U.S.C.A. § 1801(b)(5)(2007). "The Gulf of Mexico Fishery Management Council shall consist of the States of Texas, Louisiana, Mississippi, Alabama, and Florida and shall have authority over the fisheries in the Gulf of Mexico seaward of such States." *Id.* at § 1852(a)(1)(E).

3. The characterization of the Gulf of Mexico Fishery Management Council as a "quasi-federal entity" comes from Wayne Swingle, former Executive Director of the Council. Email from Wayne Swingle (March 24, 2008) (on file with author).

4. 16 U.S.C.A. §§ 1851(a)(2) & 1852(h)(2007).

5. An "anadromous species" is a species of fish which spawns in fresh or estuarine waters of the United States and which migrate to ocean waters. 16 U.S.C.A. § 1802(1)(2007).

Aquaculture is defined as “the propagation and rearing of aquatic species in controlled or selected environments.”<sup>7</sup> Prior to 1996, this program mainly consisted of research and development used by commercial fisheries to develop technologies for farmed salmon, shellfish, and shrimp culture operations throughout the United States and the world, including operations in Norway, the United Kingdom, and Chile.<sup>8</sup> However, the 1996 Sustainable Fisheries Act amendments to the Magnuson-Stevens Act delegated regulatory responsibility for aquaculture development in the Exclusive Economic Zone of the United States to the National Marine Fisheries Service.<sup>9</sup> The Exclusive Economic Zone (EEZ) occupies an area between twelve miles and 200 miles offshore, including areas contiguous to United States commonwealths, territories, and possessions.<sup>10</sup> Although the NMFS has the authority to regulate aquaculture development in the Exclusive Economic Zone, no current regulatory scheme provides a clear mechanism to allow commercial aquaculture in federal waters.<sup>11</sup> The NMFS currently requires an “exempted

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6. National Oceanic and Atmospheric Administration, [NOAA’s] *Aquaculture Policy* (February 1998), at 1, available at [http://aquaculture.noaa.gov/pdf/17\\_noaaAqpolicy.pdf](http://aquaculture.noaa.gov/pdf/17_noaaAqpolicy.pdf). The federal definition of aquaculture comes from the 1980 Memorandum of Understanding between the US Departments of Agriculture, Commerce, and Interior. *Id.*

7. *Id.*

8. *Id.* at 2.

9. *Id.* at 3. Such authority comes from the Act’s broad definition of “fishing,” which covers the harvesting of fish. 16 U.S.C.A. § 1802(16)(2007).

10. The EEZ is to be distinguished from “state waters,” which were defined in the Submerged Lands Act as an area three nautical miles seaward from the baseline (the boundary line dividing the land from the ocean). 43 U.S.C.A. § 1312 (2006). See also, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, *AN OCEAN BLUEPRINT FOR THE 21ST CENTURY*, 70-72, [HEREINAFTER OCEAN BLUEPRINT] available at [http://oceancommission.gov/documents/full\\_color\\_rpt/03a\\_primer.pdf](http://oceancommission.gov/documents/full_color_rpt/03a_primer.pdf). Each coastal nation is allowed to establish an exclusive economic zone for the purpose of exploring, managing, conserving, and exploiting living and nonliving resources in ocean waters or in the seabed or subsoil. 1982 UN Convention on the Law of the Sea, 1833 U.N.T.S. 397 (1994). President Reagan declared the US EEZ in 1983. OCEAN BLUEPRINT, *supra*, at 72. See also, 16 U.S.C.A. § 1802(11) (defining EEZ for purposes of the Magnuson-Stevens Act).

11. National Oceanic and Atmospheric Administration, The National Offshore Aquaculture Act of 2007, <http://aquaculture.noaa.gov.us/2007.html> (last visited Mar. 29, 2010). See also, Alison Rieser, *Defining the Federal Role in Offshore Aquaculture: Should it Feature Delegation to the States?*, 2 OCEAN & COASTAL L.J. 209, 220-23 (1997) (describing the lack of a cohesive mechanism to permit commercial aquaculture amongst the various federal and state agencies involved in aquaculture management); Erin R. Englebrecht, Comment, *Can Aquaculture Continue to Circumvent the Regulatory Net of the Magnuson-Stevens Fishery Conservation and Management Act?*

fishing permit” to conduct aquaculture in federal waters; furthermore, an exempted fishing permit only allows for the harvest of species managed under a fishery management plan for “limited testing, public display, data collection, exploratory, health and safety, environmental cleanup, and/or hazard removal purposes.”<sup>12</sup>

Commentators are engaged in an ongoing debate regarding whether and on what scale the United States should begin large scale commercial offshore aquaculture.<sup>13</sup> In part because no overarching federal regulatory scheme controls commercial aquaculture, any offshore aquaculture that develops is subject to a myriad of federal environmental laws. Furthermore, many coastal states have statutes regulating aquaculture in their own waters (near-shore aquaculture). Criticism of this multi-pronged regulatory approach<sup>14</sup> has led to two concurrent developments with divergent interests: 1) a proposed amendment to the Gulf of Mexico Fishery Management Council’s Fishery Management Plan to “provide for the regulation of offshore marine aquaculture,” and 2) the creation of a yet-to-be enacted national regulatory program, dubbed the National Offshore Aquaculture Act, “for the establishment and implementation of a regulatory system for offshore aquaculture” in the United States Exclusive Economic Zone.<sup>15</sup> The differing regulatory approaches pit region against region, and regional interests against national interests. Without a well-defined regulatory framework, the Gulf of Mexico’s Fishery Management Plan amendment to begin offshore aqua-

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51 EMORY L.J. 1187, 1201-04 (2002) (addressing the inadequacies of the current federal and state regulatory scheme).

12. 50 C.F.R. § 600.745(b)(1) (1996).

13. For example, Jeffrey Sachs, Director of The Earth Institute at Columbia University, argues strenuously for environmentally sound cultivation of herbivorous aquatic species, as opposed to harvesting such species, to relieve pressure on oceans. See generally, JEFFREY D. SACHS, COMMON WEALTH: ECONOMICS FOR A CROWDED PLANET (Penguin, 2008).

14. See generally, Rieser, *supra* note 11; Englebrecht, *supra* note 11. Furthermore, according to the NOAA, “[c]urrent U.S. law does not provide clear mechanisms to allow commercial aquaculture operations in federal waters. . . . That regulatory uncertainty is widely acknowledged as the major barrier to the development of aquaculture in federal waters.” <http://aquaculture.noaa.gov/us/2007.html>.

15. Gulf of Mexico Fishery Management Council & NOAA National Marine Fisheries Service, Public Hearing Draft: Generic Amendment to The Gulf of Mexico Fishery Management Council’s Red Drum, Reef Fish, and Stone Crab Fishery Management Plans and the Gulf of Mexico and South Atlantic Fishery Management Council’s Joint Spiny Lobster and Coastal Migratory Pelagics Fishery Management Plan to Provide for the Regulation of Offshore Aquaculture (Dec. 07, 2007) available at [www.gulfcouncil.org/Beta/GMFCWeb/Aquaculture/Aqua-amend% 20DP EIS%20120707%20with%20index.pdf](http://www.gulfcouncil.org/Beta/GMFCWeb/Aquaculture/Aqua-amend%20DP%20EIS%20120707%20with%20index.pdf).

culture permitting has entered into effect by operation of law due to NOAA's failure to approve, partially approve, or disapprove the GMFMC's actions.<sup>16</sup>

This Comment will examine the issues that frame the aquaculture debate. These issues include economic reasons to engage or not engage in federally sponsored large-scale commercial aquaculture, possible environmental damage caused by aquaculture facilities, and the lack of a comprehensive scheme to regulate commercial aquaculture. The Comment will then review the two currently debated plans to implement commercial offshore aquaculture – the amendment to the Gulf Council's Fishery Management Plan and the federal regulatory program proposed by Congress. A review of these issues leads the author to two conclusions. First, for both economic and environmental reasons, the United States should not engage in large-scale offshore commercial aquaculture, insofar as such plans are currently being debated. However, this conclusion is moot; undoubtedly, the United States is headed towards large-scale offshore commercial aquaculture. The second conclusion is that given that we are headed in such a direction, the comprehensive federal regulatory scheme proposed by Congress provides a better vehicle through which to manage both commercial objectives and environmental concerns.

## II. AQUACULTURE'S BACKGROUND

Peering through the taut weave of polymer netting, a diver could easily believe the sea holds a limitless supply of fish. Inside the submerged cage, tens of thousands of sleek carnivores rub fins as they navigate their salt-water territory.<sup>17</sup>

Aquaculture is considerably more prevalent in other areas in the world than in the United States. In 2004, countries in Asia and the Pacific region accounted for over ninety percent of the world's aquaculture product supply, with China leading production at over sixty-five percent.<sup>18</sup> North America contributed only slightly over one percent to the world's supply of aquaculture production.<sup>19</sup> Amongst that one percent, channel catfish continues to be the most

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16. 16 U.S.C.A. § 1854(a)(3) (requiring the Secretary to approve, partially approve, or disapprove an amendment to a region's Fishery Management Plan).

17. David Helvarg, *Farming's New Wave*, POPULAR MECHANICS, Aug. 2005, at 46.

18. Food and Agriculture Organization of the United Nations, *THE STATE OF WORLD FISHERIES AND AQUACULTURE 2006*, 16 (FAO 2007). The FAO estimations include both food fish and aquatic plants.

19. *Id.*

popular food fish product in the United States, and Atlantic and Pacific salmon in Canada.<sup>20</sup> Although the United States is only eleventh in volume of aquaculture producers, it is the third largest consumer of seafood in the world.<sup>21</sup> In 2006, the United States imported \$13.4 billion in edible fishery products, fifty-seven percent of which was from Asia alone.<sup>22</sup> In contrast, the United States only exported \$4.2 billion in edible fishery products,<sup>23</sup> leaving the economy with a \$9.2 billion trade deficit. The federal government estimates that by 2025, there will be a 2-4 million ton domestic seafood gap in the United States, based on demand growth projections.<sup>24</sup> The rapid expansion of aquaculture worldwide has been coined “The Blue Revolution,” mirroring “The Green Revolution” of the 1950s that led to higher grain yields in agriculture.<sup>25</sup>

While the federal government has been involved in the production of fish culture research and development since the late 1800s, the focus has been on “restoring and enhancing domestic freshwater and anadromous species in inland waters.”<sup>26</sup> By the late 1970s, however, the increasing trade deficit for fishery products led to the National Aquaculture Policy Act of 1980, designed to “promote the economic development of the industry to augment the commercial and recreational fisheries in the United States.”<sup>27</sup> In 2001, the Joint Subcommittee on Aquaculture released an updated National Aquaculture Development Plan which emphasized reducing the trade

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20. *Id.* at 17.

21. *Id.* at 16.

22. National Marine Fisheries Service, *Fisheries of the United States 2006*, 48 (July 2007), available at <http://www.st.nmfs.noaa.gov/st1/fus/fus06/>.

23. *Id.*

24. NOAA Aquaculture Program, *Quick Stats* (March 12, 2007), available at [www.aquaculture.noaa.gov](http://www.aquaculture.noaa.gov).

25. Jeffrey D. Sachs, *The Promise of the Blue Revolution*, SCIENTIFIC AMERICAN, (July 2007). See also, Susan Stonich, *Resisting the Blue Revolution: Contending Coalitions Surrounding Industrial Shrimp Farming*, HUMAN ORGANIZATION (Spring 2000).

As the Green Revolution was acclaimed as the means to end world hunger, the Blue Revolution often is hailed as a way to increase incomes and the available supply of affordable food among the poor in the third world. As the Green Revolution was necessary to the establishment of the global agro-food system, the Blue Revolution is an essential part of integrating many important aquatic species and coastal ecosystems into that same global system.

*Id.*

26. See Englebrecht, *supra* note 11, at 1191.

27. *Id.*

deficit in farmed fish products by commercial expansion into the Exclusive Economic Zone.<sup>28</sup>

### A. Current United States Finfish Aquaculture Production

Marine aquaculture is “analogous to terrestrial farming and involves some form of intervention in the rearing process to enhance production, such as regular stocking, feeding, and protection from predators.”<sup>29</sup> Five finfish (as opposed to shellfish) farms currently operate in the United States; none exist in federal waters or operate in the Gulf of Mexico.<sup>30</sup> In Hawaiian waters, Hukilau Foods grows Pacific threadfin (moi – *polydactylus sexfilis*) and Kona Blue Water Farms grows amberjack (kampachi).<sup>31</sup> Sanapperfarm, Inc. grows cobia (lemonfish – *rachycentron canadum*) and mutton snapper (*lutjanus analis*) off of the coast of Puerto Rico.<sup>32</sup> The University of New Hampshire operates an Open Ocean Aquaculture demonstration project that raises halibut, haddock, flounder, and cod in New Hampshire waters.<sup>33</sup> Finally, Isle of Shoals Mussels operates a commercial longline mussel operation begun by New Hampshire commercial fishermen.<sup>34</sup>

Hukilau Foods operates four open ocean cages located two miles offshore and 40 feet under the surface, under a lease from the Hawaiian government.<sup>35</sup> The submerged cages produce about 900,000 pounds of fish per year, with plans to increase production to around 1.5 million pounds.<sup>36</sup> Formerly Cates International, Inc., the company became the first open ocean farm in the United States in 2000, established after a successful Open Ocean Aquaculture Demonstration Program run by the University of Hawaii.<sup>37</sup> In 2003, Hukilau posted \$1.4 million in moi sales.<sup>38</sup>

Kona Blue was founded in 2001 and uses an inclusive “hatch-to-harvest” approach to aquaculture, wherein eggs hatch in controlled

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28. *Id.* at 1192 (citing JOINT SUBCOMMITTEE ON AQUACULTURE, 2000 ACTIVITIES (2000)).

29. Draft Amendment, *supra* note 15, at 6.

30. *Id.* at 11.

31. *Id.*

32. *Id.*

33. *Id.*

34. Draft Amendment, *supra* note 15, at 11.

35. Hukilau Foods, [www.hukilaufoods.com/about\\_us](http://www.hukilaufoods.com/about_us) (last visited Mar. 29, 2010).

36. *Id.*

37. *Id.*

38. Draft Amendment, *supra* note 15, at 11.



technological fishery conditions and fish are grown in open ocean pens half a mile off of the Hawaii coast.<sup>39</sup> Kona Blue's process differs from Hukilau's process, in that Hukilau relies on capturing wild fingerlings to stock its cages, whereas Kona Blue actually hatches its own eggs.<sup>40</sup> Kona Blue currently operates eight submersible cages at a total company investment of \$33 million.<sup>41</sup> According to the company, Kona Blue furthers "the ancient Hawaiian tradition of aquaculture by leveraging innovative, state-of-the-art hatchery and open ocean grow-out technology."<sup>42</sup> The University of New Hampshire Open Ocean Aquaculture project began in 1997; while it does not sell fish commercially, its technology is in active use at Kona Blue Farms.<sup>43</sup> The project also developed a process for culturing blue mussels; this process has already been picked up by the Isle of Shoals group, which produces 180,000 pounds of mussels annually.<sup>44</sup>

Snapperfarm, Inc. operates submerged cages thirty-five feet below the ocean surface off the coast of Culebra, Puerto Rico.<sup>45</sup> Snapperfarm's goal is to take advantage of "one of mankind's last great frontiers and untapped resources."<sup>46</sup> By 2003 the company produced 50,000 pounds of fish, and it is now considering cultivation of the Caribbean spiny lobster (*panilirus argus* - known to many folks as crawfish).<sup>47</sup> Each of the cages at Snapperfarm is attached to a 25,000 pound concrete block resting ninety-three feet below the seabed surface; the only thing that separates 15,000 fish from circling sharks is the eighty-five foot wall of Spectra netting,<sup>48</sup> "[resembling] a sunken spacecraft."<sup>49</sup> The project operates three fish cages.

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39. Kona Blue, <http://www.kona-blue.com/sustainability.php> (last visited Mar. 29, 2010).

40. *Id. compare with* Hukilau Foods, <http://www.hukilaufoods.com/about.us> (last visited Mar. 29, 2010).

41. Draft Amendment, *supra* note 15, at 12.

42. Kona Blue, <http://www.kona-blue.com/sustainability.php> (last visited Mar. 29, 2010).

43. Atlantic Marine Aquaculture Center, [http://ooa.unh.edu/about/about\\_what.html](http://ooa.unh.edu/about/about_what.html) (last visited Mar. 29, 2010).

44. Draft Amendment, *supra* note 15, at 12.

45. *Id.*

46. Snapperfarm, <http://www.snapperfarm.com/2006/aboutopenoceanaquaculture.htm> (last visited Mar. 29, 2010).

47. *See* Draft Amendment, *supra* note 15, at 12.

48. Helvarg, *supra* note 1, at 47.

49. Elizabeth Querna, *Fixing Fish Farms*, US NEWS & WORLD REPORT, Aug. 2004, available at <http://www.unbsj.ca/sase/biology/chopinlab/articles/files/fixing%20fish%20farms%20US%20NEWS.pdf>.

Although there are only five such projects currently operational, other companies have submitted lease applications to the state to operate more farms off the coast of Hawaii.<sup>50</sup> Furthermore, the Hubbs-Sea World Research Institute has leased an oil platform in federal waters off the coast of California to conduct a study of the feasibility of using offshore oil platforms for the development of marine aquaculture;<sup>51</sup> this research is certainly significant for the Gulf of Mexico Fishery Management Council and various oil producing states along the United States coastline. Louisiana commentators have remarked that the presence of several deep water structures (mainly oil and gas platforms) off the state's coast support an argument that Louisiana will be disproportionately affected by the implemented GMFMC plan.<sup>52</sup>

### *B. Necessity of Open Ocean Aquaculture*

In 1997, attorneys for the Environmental Defense Fund remarked "as the [aquaculture] industry continues to grow, it will likely expand into the open ocean."<sup>53</sup> They also argued that conditions in the late 1990s - the high cost of engineering and building facilities able to withstand ocean storm conditions, the high cost of operating facilities far from shore, and the absence of a cohesive framework, would limit aquaculture's expansion into the ocean.<sup>54</sup>

The most prevalent stated reason for the need to expand aquaculture is the inability to supply the world's population with an adequate supply of marine food products given the stagnant rate of growth in capture fisheries and estimates of increased population.<sup>55</sup> In 1998, aquaculture experts predicted that total production will have reached between 35 million and 40 million tons of finfish, crustaceans, and mollusks by 2010.<sup>56</sup> "More than half a decade ahead of

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50. Draft Amendment, *supra* note 15, at 13.

51. *Id.*

52. For example, see Paula Devlin, *U.S. agency approves plan for Gulf fish farming*, *The Times Picayune*, September 3, 2009, available at [http://www.nola.com/business/index.ssf/2009/09/us\\_agency\\_approves\\_plan\\_for\\_gu.html](http://www.nola.com/business/index.ssf/2009/09/us_agency_approves_plan_for_gu.html).

53. D. Douglas Hopkins, Rebecca J. Goldberg, & Andrea Marston, *An Environmental Critique of Government Regulations for Open Ocean Aquaculture*, 2 *OCEAN & COASTAL L.J.* 235, 236 (1996-1997).

54. *Id.*

55. See generally, FAO Report, *supra* note 18; Draft Amendment, *supra* note 15; NOAA Aquaculture Policy, *supra* note 6.

56. THE WORLD BANK, *CHANGING THE FACE OF THE WATERS: THE PROMISE AND CHALLENGE OF SUSTAINABLE AQUACULTURE 1* (2007).

[those] projections,” aquaculture production reached 45 million tons.<sup>57</sup> By 2004, aquaculture accounted for over forty percent of the global fish food supply; to compare, capture fisheries have averaged a growth rate of less than two percent.<sup>58</sup> Other common reasons given for the expansion of aquaculture into federal waters are: avoidance of state law regulation, avoidance of conflicts with other human uses of the sea surface, the ability to minimize regulatory compliance burdens because effluents are more readily disbursed,<sup>59</sup> and the ability to farm fish while maintaining the aesthetic look of a coastal area.<sup>60</sup>

More recently, advocates of open ocean aquaculture have cited a common theme to encourage commercial development of marine foods in federal waters: prevention of a race to the bottom for scarce environmental resources.<sup>61</sup> The prevention of a race to the bottom can encourage the United States to be (or not to be) involved in the production of aquaculture at all, *vis-à-vis* other nations. For example, China dominates the world’s production of aquaculture. Furthermore, the prevailing view is that “China’s economic planners view pollution as an inevitable or necessary byproduct of economic development. . . . hence, they are more interested in maintaining China’s comparative advantage as the world’s number one low-cost producer.”<sup>62</sup> China’s lower production costs, due to the lack of environmental regulatory compliance overhead, are thought to put domestic fisheries at a competitive disadvantage.

The perceived competitive disadvantage does not necessarily diminish if the United States decides to wade into the aquaculture market full force. Aquaculture firms will still undoubtedly be subject to a myriad of environmental laws: the Clean Water Act (most likely by National Pollution Discharge Elimination System point source permitting); the Endangered Species Act (if the installation,

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57. *Id.*

58. *Id.* at 15.

59. Hopkins, *supra* note 47.

60. Hope M. Babcock, *Grotius, Ocean Fishing Ranching, and the Public Trust Doctrine: Ride ‘Em Charlie Tuna*, 26 STAN. ENVTL L.J. 3, 24 (2007).

61. See, e.g., Thomas R. Head, III, *Fishy Business – Regulating Aquaculture Operations in the United States*, 18 NAT. RESOURCES & ENV’T 21 (2004).

62. Srinu Sitaraman, *Regulating the Belching Dragon: Rule of Law, Politics of Enforcement, and Pollution Prevention in Post-Mao Industrial China*, 18 COLO. J. INT’L ENVTL. L. & POL’Y 267, 303 (2007). See generally, Thomas Friedman, Op-Ed, *Bring in the Green Cat*, N.Y. TIMES, Nov. 15, 2006; Pan Yue, *Growth vs. Ecological Calamity in China*, 23 NEW PERSP. QUARTERLY 54 (2006); Richard McGregor, *Pollution Fears Over China’s Growth*, FIN. TIMES, Jan. 12, 2007.

creation, or maintenance of an aquaculture net, pen, or cage threatens an endangered species or its critical habitat); and the Marine Mammal Protection Act, to mention just three. For instance, the Congressional Research Service noted that even if the National Off-shore Aquaculture Act passes, “[a]ny U.S. open ocean aquaculture enterprise will also face issues of how to compete in a global marketplace with nations whose aquaculture production costs are likely much lower.”<sup>63</sup> Therefore the allure - for United States firms to invest in aquaculture operations and for ordinary consumers to purchase cheaper imported aquaculture products still exists. However, one could envision the ability of the United States aquaculture market to position itself strategically, for consumers who use their purchasing power in environmentally friendly ways, as the “clean” aquaculture industry.<sup>64</sup> According to Dan Swecker, founder of one of the first United States near-shore salmon farms, it may be too late to even mount a viable commercial industry because “[t]he industry went somewhere else already.”<sup>65</sup>

Furthermore, assuming that the United States could eliminate, or at least mitigate to a profitable extent, competitive disadvantages, the finfish currently produced in an aquaculture environment, if expanded, would do little to ease the trade deficit. For example, Snapperfarm and Hukilau in Puerto Rico and Hawaii, respectively, each produce high-end sushi appropriate fish for sale in restaurants (amberjack and yellowtail (moi)). However, major seafood imports into the United States include shrimp, salmon, crabs, tilapia, tuna, and shellfish foods that are common seafood types available at grocery stores and mainstream restaurants.<sup>66</sup> Among those top six sea-

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63. Eugene H. Buck & Rachel Borgatti, Congressional Research Service Report for Congress, *Open Ocean Aquaculture*, Dec. 13, 2004, available at [assets.opencrs.com/rpts/RL32694\\_20041213.pdf](http://assets.opencrs.com/rpts/RL32694_20041213.pdf).

64. See generally, Matthew Kirdahy, *Responsibility Pays*, FORBES (Nov. 13, 2007) available at [http://www.forbes.com/leadership/2007/11/12/corporate-philanthropy-projects-lead-citizen-cx\\_mk\\_1112donors.html](http://www.forbes.com/leadership/2007/11/12/corporate-philanthropy-projects-lead-citizen-cx_mk_1112donors.html); Cait Murphy, *The Next Big Thing*, FORTUNE SMALL BUSINESS, June 4, 2003. For some companies that have the ability to produce U.S. aquaculture products for export, this marketing advantage may even prove fruitful in other countries. See, e.g., Vicki Silverman, United States Exhibitors Report Big Rise in Green Business (Apr. 26, 2004) (statement of the United States Department of State), available at <http://america.gov/st/washfile-english/2004/April/20040426145651HVnamerevliso.html>.

65. Querna, *supra* note 44, at 62.

66. FOOD & WATER WATCH, FISHY FARMS 8 (2007), available at <http://www.foodandwaterwatch.org/fish/publications/reports/fishy-farms> (collecting and summarizing data from *Fisheries of the United States 2006*, Office of Science and Technology, National Marine Fisheries Service, National Oceanic and Atmos-

food imports, the United States *exports* 71 percent of its domestic production.<sup>67</sup> Therefore, if United States aquaculture firms continue a pattern of cultivating “designer” fish, high scale production of these fish will do little to ease the import of frequently purchased consumer grade fish and shellfish.<sup>68</sup> Possibly more economically detrimental is the idea that commercial aquaculture in federal waters could *lower* the price for wild fish caught by domestic fishermen. While a lower market-based price for non-farmed fish caught by domestic fishermen may decrease the numbers of fish caught overall, it would certainly drive some domestic fishermen out of business.

Preventing a race to the bottom reinforces the benefit of a federalized aquaculture environment, as opposed to the current model, one that relies on regional fishery management councils. If all eight regional fishery management councils were subject to the same standards, one council could not attract more aquaculture business to the detriment of that localized area’s watershed quality and the commercial interests of another region. The prevention of a race to the bottom *vis-à-vis* another geographic region has been the precursor of many of the federal government’s overarching environmental laws, such as federal programs for the elimination of air and water pollution.<sup>69</sup>

### III. AQUACULTURE’S ENVIRONMENTAL IMPACTS

Aquaculture simultaneously poses the risks of transformation of entire wild ecosystems and the promise of managed aquatic ecosystems.<sup>70</sup>

Undoubtedly, aquaculture’s expansion into the open ocean will lead to environmental problems. However, the *need to expand* aquaculture to the open ocean is causally connected to current near-shore environmental problems. In some areas, fish cannot be farmed near the coastline (in state-controlled waters) because of water quality problems caused by nonpoint and point source pollution

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pheric Administration (July 2007), *Imports and Exports of Fishery Product Annual Summary, 2006*, Fisheries Statistics Division, National Marine Fisheries Service, NOAA (2007)).

67. *Id.*

68. However, this would not be necessarily true of catfish, trout, and salmon, all current United States aquaculture products – this would depend on whether *those particular* heavily imported and exported finfish were to be produced on a broader scale.

69. For example, the Clean Water Act, 33 U.S.C.A. § 1251 *et seq.* (2006).

70. WORLD BANK, *supra* note 50, at 15.

including fertilizers, bacteria, pesticides, chemicals, acid deposition, sediment, and other possibly toxic pollutants.<sup>71</sup> Moreover, current near-shore aquaculture operations can damage water quality to the detriment of future operations. This may become an issue in Hawaii, as several more firms have applied for permits in areas near aquaculture operations owned by Hukilau and Kona Blue.<sup>72</sup>

The fact that aquaculture takes place in water, as opposed to agriculture, which takes place on land, represents both a challenge and benefit to aquaculture operations. Water operates as a natural filter, mitigating the effects of chemicals or pollutants. Additionally, one could argue that the vast quantity of moving ocean current means that the oceans are much more suitable to aquaculture than near-shore water bodies. However, because aquaculture takes place in moving water, a higher probability of “inadvertent transmission and spread of wastes, diseases, and genetic material, including introduced species and strains” exists.<sup>73</sup> Furthermore, “[a]quaculture poses a range of threats to aquatic biodiversity, and control over breeding and reproduction of farmed species is substantially more difficult than in the case of most livestock.”<sup>74</sup>

Ecosystem degradation can occur because of solid waste production in the form of excess feed and fecal matter, which falls outside of a contained area and can be transferred to other wild fish. For example, cage salmon aquaculture operations in Scotland during the late 1990s generated 50,000 tons of untreated and contaminated waste, equivalent to the sewage waste of the population of up to three-quarters of Scotland’s population.<sup>75</sup> A senior scientist with the conservation group Environmental Defense argues that growth in the offshore aquaculture industry close to the NOAA’s goal of \$5 billion per year would create as much nitrogen waste as that equivalent to “the untreated sewage of 17 million people.”<sup>76</sup>

Additionally, fish farmers use antibiotics to control disease, pesticides to control parasites, and hormones to induce spawning and yield a larger catch.<sup>77</sup> In 1995, a herpes virus outbreak near several

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71. See Babcock, *supra* note 54, at 23.

72. See Draft Amendment, *supra* note 15, at 13.

73. WORLD BANK, *supra* note 50, at 15.

74. *Id.*

75. Craig Emerson, *Aquaculture Impacts on the Environment* (1999), available at [www.csa.com/discoveryguides/aquacult/overview.php](http://www.csa.com/discoveryguides/aquacult/overview.php).

76. Anne Mosness, An update to our report in April 2005: Ocean Aquaculture, June 2006, available at [www.pccnaturalmarkets.com/SC/0606/SC0606-aquaculture.html](http://www.pccnaturalmarkets.com/SC/0606/SC0606-aquaculture.html).

77. Head, *supra* note 55, at 21.

tuna farms sideswiped the Australian aquaculture community, leaving behind a “sea of dead fish” – eventually killing 75 percent of the pilchards (a fish related to the herring) in the region.<sup>78</sup> Although there has been no conclusive proof of the source of the virus outbreak, members of Western Australia’s Department of Fisheries believe that importing pilchards from “wherever the deal was cheap” led to the infestation.<sup>79</sup> Three years later, another attack wiped out most of the remaining pilchards.<sup>80</sup> Salmon anemia, although not harmful to humans, is currently killing off so many farmed salmon in Chile that the salmon farming industry, the third largest industry in the country, has laid off more than 1,000 workers.<sup>81</sup> The virus has been linked to widespread use of chemicals and antibiotics in fish pens.<sup>82</sup> According to one local Chilean fisherman, “the salmon companies ‘are robbing [them of their] wealth’ . . . [The companies] bring illnesses and then leave [the fishermen] with the problems.”<sup>83</sup>

Closer to home, more and more species are being discovered off the coast of North America that carry a particular strain of hemorrhagic virus, as an expanding sardine population migrates north from Mexican waters in search of food.<sup>84</sup> According to one fish health observer, “opening more offshore farms in the United States will only open more opportunities for unregulated trade to spread disease.”<sup>85</sup> Some ecologists question the proposition that penned fish are giving viruses to wild fish; some say that it is just as likely that wild fish may give viruses to penned fish.<sup>86</sup> One such marine ecologist, Donald Kent, served on the Marine Fisheries Advisory Committee by appointment in 2002; the Committee serves as an advisory board to the National Marine Fisheries Service on policies such as the proposed offshore farming legislation.<sup>87</sup> Moreover, Kent is currently president of the Hubbs Sea-World Research Institute, a California group that has applied for a research grant and permit

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78. Rex Dalton, *Fishing for Trouble*, 431 NATURE 502, 503 (Sept. 30, 2004).

79. *Id.* at 503-04.

80. *Id.* at 503.

81. Alexei Barrionuevo, *Salmon Virus Indicts Chile’s Fishing Methods*, N.Y. TIMES, March 27, 2008, at A6, available at <http://www.nytimes.com/2008/03/27/world/americas/27salmon.html>.

82. *See Id.*

83. *Id.*

84. Dalton, *supra* note 75, at 504.

85. *Id.*

86. *Id.*

87. *Id.*

from the state to conduct offshore aquaculture on an unused oil platform located in the Pacific Ocean.<sup>88</sup>

Fish may escape – possibly leaving “biological pollution” by altering native species composition and introducing foreign matter, such as antibiotics, into the native population.<sup>89</sup> For example, in 1999, federal officials in Maine estimated that only 500 Atlantic salmon with a native genetic makeup were left in the wild.<sup>90</sup> Aquaculturists that can genetically manipulate salmon through selective breeding with traits that are necessary to aquaculture at the expense of other characteristics can unintentionally breed traits that leave salmon less likely to survive in the wild upon escape and spawning.<sup>91</sup> In Everglades National Park, a release of blue tilapia in Florida has led to the loss of food, native habitat, and spawning areas for native species.<sup>92</sup>

Maintaining an aquaculture operation can itself lead to further depletion of the native fish population. Fish meal and fish oils from natural stocks are the main ingredients in artificial feed for carnivorous fish (such as salmon).<sup>93</sup> Between 1999 and 2003, the aquaculture industry’s use of fishmeal and fish oil increased three-fold to three million tons and 800,000 tons, respectively.<sup>94</sup> In the late 1990s, it took three to five pounds of wild fish to produce only a pound of salmon; between 1985 and 1995, it took 36 million tons of wild fish to produce only 7.2 million tons of shrimp.<sup>95</sup> Currently, every two to six pounds of fish caught in the wild yield only one pound of cage raised fish.<sup>96</sup> Removing fish to create fish meal can lead to less food available for commercially valuable predatory fish and other animals dependent on marine life, such as seabirds, sea lions, and seals. Researchers at Snapperfarm have reported that using fishmeal “can be 3.7 times more efficient” than natural transformation.<sup>97</sup> The group is currently investigating the utilization of grain based feeds as opposed to fishmeal from the native population, given the “widely recognized” need to eliminate the use of fishmeal in aquaculture

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88. *Id.*

89. Head, *supra* note 58, at 21.

90. Emerson, *supra* note 72, at 4.

91. *Id.*

92. *Id.* at 5.

93. *Id.* at 3.

94. Food & Water Watch, *supra* note 64, at 4.

95. *Id.*

96. *Id.* at 3.

97. Daniel Benetti, et al, *Can Offshore Aquaculture of Carnivorous Fish be Sustainable?*, WORLD AQUACULTURE, March 2006, 46.



feeds.<sup>98</sup> In addition to making less wild marine food available to other creatures, fishmeal, which can fall to the bottom of pens, cages, or nets, combines with similarly-released fish excrement to “suck oxygen out of the water, creating polluted ‘dead zones.’”<sup>99</sup>

Current research regarding aquaculture operations at Snapperfarm has tentatively found that there were no “significant differences” in any water quality parameters measured in the areas surrounding underwater cages.<sup>100</sup> The company’s president noted that currents carry over 500 million gallons of water through its pens each day, washing away sewage and excess food.<sup>101</sup> While Snapperfarm has benefitted from strong currents and limited aquaculture operations in its area, fish food and fecal matter still produce an “immense” amount of harmful nitrogen.<sup>102</sup> Furthermore, while some studies have shown negligible environmental impacts from current aquaculture activities, “these projects were conducted on small-scale operations mostly at low densities of fish, so their application to large-scale and/or concentrated marine fish farming is limited.”<sup>103</sup>

#### IV. PREVIOUS ATTEMPTS UNDER EXISTING LAW TO STOP AQUACULTURE PROJECTS

##### A. *Existing Federal Laws Impacting Aquaculture*

As previously mentioned, one of the impetuses for the recommendation of and congressional support for the National Offshore Aquaculture Act has been critique of the disjointed federal regulation affecting aquaculture.<sup>104</sup> The primary federal statute governing aquaculture activities is the Magnuson-Stevens Act,<sup>105</sup> which regulates

98. *Id.*

99. See Querna, *supra* note 49, at 62. Biologist Thierry Chopin has argued that a way to mitigate this problem would be to grow symbiotic species near one another. *Id.* For example, growing mussels, salmon, and seaweed in close proximity produces a natural solution to excess waste – because mussels and seaweed naturally clean up salmon waste. *Id.*

100. Benetti, *supra* note 97, at 44.

101. Querna, *supra* note 49, at 62.

102. See Helvarg, *supra* note 17, at 2.

103. MARINE AQUACULTURE TASK FORCE, *SUSTAINABLE MARINE AQUACULTURE: FULFILLING THE PROMISE; MANAGING RISKS*, 2 (Jan. 2007), available at <http://www.pewtrusts.org>. See also, Food & Water Watch, *supra* note 64, at 6.

104. See *supra*, note 11. See also, MARINE AQUACULTURE TASK FORCE, *supra* note 103, at 24-26; Babcock, *supra* note 60, at 25-26.

105. 16 U.S.C.A. §§ 1801-1883 (West 2007).

harvesting and possession of marine fish in federal waters. The Magnuson-Stevens Act governs the Gulf of Mexico Fishery Management Council's actions to maintain a sustainable yield in the Gulf of Mexico. However, under the Magnuson-Stevens Act, an exempted fishing permit from the National Oceanic and Atmospheric Administration (and NMFS) is required to engage in research-oriented aquaculture. An exempted fishing permit only covers research aquaculture operations; no permitting scheme exists for commercial aquaculture.

Several other federal statutes impact aquaculture activities. The Clean Water Act (CWA)<sup>106</sup> prohibits the discharge of pollutants into navigable waters from a point source without a National Pollution Discharge Elimination System (NPDES) permit.<sup>107</sup> The Federal Insecticide, Fungicide and Rodenticide Act (FIFRA)<sup>108</sup> regulates the labeling and use of pesticides; EPA recently amended FIFRA regulations to exempt aquaculture pesticides that can affect water quality.<sup>109</sup> The 1899 Rivers and Harbors Act (RHA)<sup>110</sup> controls the siting of structures that affect navigable waters (such as net pens or cages) as overseen by the Army Corps of Engineers. The Endangered Species Act (ESA)<sup>111</sup> protects federally listed endangered species and their and other species' critical habitats (including marine species). While all of these laws affect aquaculture, "none was really crafted with the regulation of marine aquaculture in mind."<sup>112</sup>

### B. State Aquaculture Laws

Several states have regulations concerning fish farming in state-controlled near-shore waters. For example, the Louisiana Aquaculture Development Act<sup>113</sup> provides a statewide regulatory framework "for the orderly development and maintenance of a modern aquacultural segment of Louisiana's agriculture industry and for the promotion of aquaculture and aquacultural products."<sup>114</sup> The Act

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106. 33 U.S.C.A. §§ 1251-1387 (West 2006).

107. *Id.* at § 1342.

108. 7 U.S.C.A. §§ 136-136y (West 2007).

109. 70 Fed.Reg. §§ 5093, 5098 (West 2005). The regulation applies to "producers of farm raised finfish (e.g., catfish, trout, goldfish, tropical fish, minnows) and/or hatching fish of any kind."

110. 33 U.S.C.A. § 403 (West 2007).

111. 16 U.S.C.A. §§ 1531 *et seq.* (West 2007).

112. Report of the Marine Aquaculture Task Force, *supra* note 103, at 24.

113. LA. REV. STAT. ANN. §§ 3:559.1 *et seq.* (West 2007).

114. *Id.* § 559.2(C).

created the Louisiana Aquaculture Coordinating Council, a group of commercial, governmental, and environmental representatives.<sup>115</sup> The Louisiana Aquaculture Coordinating Council recommends which marine species would be best suited for aquaculture production in state-controlled waters and advises the Commissioner for the Department of Agriculture and Forestry about possible permitting requirements.<sup>116</sup> The Commissioner has the power to issue permits and licenses for near-shore aquaculture operations and to institute actions for fines and penalties for permitting violations.<sup>117</sup> The permitting scheme provides for yearly licenses for finfish and crawfish producers; however, specific bass species are excluded.<sup>118</sup> After Hurricane Katrina, the United States Department of Agriculture awarded \$4.5 million to aquaculture producers affected by the storm through the Aquaculture Bulk Grant Program.<sup>119</sup>

### C. Previous Legal Challenges to Aquaculture Operations

Given the myriad of federal and state programs related to individual components of water quality that can impact fishing operations (i.e., polluted waterways, agricultural runoff, pesticide use, etc.), interested parties have turned to the courts when the regulatory structure fails. Thus far, the most successful challenges to state, regulated aquaculture activities have been through the use of the Clean Water Act. In *United States Public Interest Research Group v. Atlantic Salmon of Maine, LLC*, the district court<sup>120</sup> and the First Circuit Court of Appeals<sup>121</sup> found that environmental hazards caused by a local salmon farm justified both an injunction from operating until the company got a valid NPDES permit and a ban on the use of non-native salmon species. Atlantic Salmon of Maine (ASM) obtained an aquaculture lease from the state and an Army Corps of Engineers permit under the Rivers and Harbors Act, but not a Clean Water

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115. *Id.* § 559.4.

116. *Id.* § 559.6.

117. *Id.* § 559.6 B(4) & (7).

118. Ca.Rev.Stat.Aqu. 3:559.8, .14.

119. Louisiana Department of Agriculture & Forestry: *Aquaculture Producers to Get \$4.5 Million in Disaster Funds*, 2007 <http://www.ldaf.state.la.us/portal/News/PressReleaseCurrent/tabid/92/ItemId/1156/Default.aspx> (last visited Mar. 27, 2010).

120. *United States Public Interest Research Group v. Atlantic Salmon of Maine*, 257 F.Supp.2d 407, 435-36 (D.C. Me 2003).

121. 339 F.3d 23, 35 (1st Cir. 2003).

Act NPDES permit.<sup>122</sup> The company operated five salmon farms, all utilizing net pens moored to the sea floor.<sup>123</sup> Salmon were harvested for the local market after eighteen to twenty-four months.<sup>124</sup>

The district court found several environmental problems with the company's operation: discharge into the marine environment of a copper-laced chemical used to treat the nets; discharge of pharmaceutical pigments present in the salmon feed; the presence of bacterial kidney disease and vibrio; discharge of the chemicals used to treat salmon bacterial infection and sea lice; release of salmon feces and fish waste at least thirty days per year; and escapee fish that altered the genetic disposition of native fish in the area.<sup>125</sup>

Years after the company began operations, and on account of an "intent to sue" letter sent to Maine's EPA's Region One office, the EPA informed the company it would be required to obtain an NPDES permit because the farms constituted Concentrated Aquatic Animal Production Facilities under federal regulation and were therefore point sources.<sup>126</sup> ASM did not send in any of the requested information on any of the farms. In 1993, ASM wrote EPA asking for a "letter of assurance" that the farms could operate without an NPDES permit.<sup>127</sup> After receiving the letter, EPA notified the Public Interest Research Group that EPA "had not considered sea farm discharges to be a significant environmental concern, falling into the 'minor' permit category that EPA could not address due to resource constraints."<sup>128</sup>

The Court found that escaped farmed salmon were pollutants under the CWA, insofar as escapees "can negatively affect the endangered wild salmon by spreading pathogens and parasites and by competing for food, habitat, maters, and spawning sites."<sup>129</sup> The

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122. *Atlantic Salmon*, 257 F.Supp.2d at 417.

123. *Id.* at 410.

124. *Id.*

125. *Id.* at 410-12.

126. *Id.* at 414-15. Under 40 C.F.R. § 122.24(b) (West 2000), Concentrated Aquatic Animal Production facilities are point sources subject to the NPDES permitting program. A fish farm can be considered a CAAPF either because it meets certain production criteria, or because EPA determines, through a case-by-case evaluation, the facility is a "significant contributor of pollution to waters of the United States." *Id.* §122.24(c)(1).

127. *Atlantic Salmon*, 257 F.Supp.2d. at 415. Delegation to the state of Maine for the NPDES program did not occur until 2001. *Id.*

128. *Id.* at 418. A portion of the case concerns the company's adherence to the Maine Finfish Aquaculture Monitoring Program, created in 1992. *Id.* at 417. This portion of the case is not addressed by the author.

129. *Id.* at 420.

introduction of non-native species posed such a problem for the region that the EPA determined in 2000 that a valid NPDES permit must prohibit non-North American salmon strains.<sup>130</sup> Despite the myriad of environmental harms done by ASM, the Court found that the company had attempted to mitigate some of the “negative impacts” of its operations, some at considerable costs.<sup>131</sup> Furthermore, the Court placed much blame where it rightfully belonged – at the foot of the state and federal agencies involved in the aquaculture industry.<sup>132</sup> The Court noted that “regulatory inertia” had given ASM “a free pass to continue their heedless despoiling of the environment.”<sup>133</sup>

In order to rectify the damage, the court issued a permanent injunction against the use of non-North American strains of Atlantic salmon and an injunction against operations until the company obtained the requisite NPDES permit.<sup>134</sup> The First Circuit upheld the injunction irrespective of the fact that Maine issued ASM a general permit for salmon aquaculture that would *permit* restocking one of ASM’s farms with non-native salmon.<sup>135</sup>

As *Atlantic Salmon* demonstrates, the Clean Water Act could potentially be a powerful tool to remediate and mitigate environmental harms caused by offshore aquaculture. However, one conclusion of the court, that pesticides were pollutants from a point source subject to the NPDES program, can be undercut in future cases by recent EPA action concerning the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). The EPA recently added regulations to FIFRA that would exempt pesticides used in aquaculture from the proscriptions of the Clean Water Act. In 2005, the EPA issued a rule that “exclude[s] applications of pesticides to waters of the United States [from the Clean Water Act] consistent with all relevant requirements under FIFRA” in two cases:

- 1) the application of pesticides ‘directly to’ waters of the United States in order to control pests; and
- 2) the application of pesticides to control pests that are present over waters of the United States, including near such waters, that results in a

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130. *Atlantic Salmon*, 257 F.Supp.2d. at 421n:6. By that time, Maine operated its own NPDES permit system. *See supra*, note 127.

131. *Id.* at 431.

132. *Id.* at 430-31.

133. *Id.* at 431.

134. *Id.* at 434-35.

135. *Atlantic Salmon*, 339 F.3d at 30-31.

portion of the pesticides being deposited to waters of the United States.<sup>136</sup>

The regulation specifically affects farming and fishery hatcheries that produce farm raised finfish, including catfish, trout, goldfish and any hatching fish of any kind.<sup>137</sup> According to the EPA, “these types of applications do not require NPDES permits under the Clean Water Act if the pesticides are applied consistent with all relevant requirements under FIFRA (*i.e.*, those relevant to protecting water quality).”<sup>138</sup> FIFRA, however, is not a statute concerned with water quality; unarguably, the predominant federal statute concerning water quality is the Clean Water Act. Therefore, application of this FIFRA regulation would preclude a court from enjoining discharges of pesticides from a fish farm.

In *Assoc. to Protect Hammersley, Eld, and Totten Inlets v. Taylor Resources, Inc.*, the Ninth Circuit found that the release of naturally occurring materials from a mussel harvesting facility, which enter Puget Sound, were not discharges in violation of the CWA.<sup>139</sup> The critical distinction between these two cases is that Taylor Resources “does not add any fish food or chemicals to the water; the mussels are nurtured exclusively by the nutrients found naturally in the waters of Puget Sound.”<sup>140</sup> Taylor Resources attaches mussel seeds to suspension ropes that are anchored to the sea floor.<sup>141</sup> The ropes are then surrounded by mesh netting that protects the mussels from predators; no chemicals or fish food is added to the water and the mussels develop naturally.<sup>142</sup> The court found no violation even though mussel byproduct and shell were released from the facility, adding “something” to Puget Sound.<sup>143</sup>

Thus, EPA’s mandate is clear: at this point, the only effective way to control near-shore marine aquaculture on the federal level, the Clean Water Act, would not now apply to pesticides released into fish farm waters. Given that the Clean Water Act may no longer operate as an effective enforcement mechanism for commercial aquatic facilities, *something* should be done to regulate the expansion of aquaculture.

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136. Application of Pesticides to Waters of the United States in Compliance with FIFRA, 70 Fed. Reg. 5093, 5097-98 (Jan. 25, 2005).

137. *Id.* § 5094.

138. *Id.* § 5098.

139. 299 F.3d 1007, 1019 (9th Cir. 2002).

140. *Id.* at 1010.

141. *Id.*

142. *Id.*

143. *Id.*

## V. CONCURRENT EFFORTS TO RESOLVE THE CONFLICT

Given the state of the law, both regional fishery associations and the federal government recognize the need to regulate aquaculture expanding into the open ocean. Each group has proposed a solution; the solutions, however, are inconsistent. Both the Gulf of Mexico Fishery Management Council and the federal government have proposed a regulatory solution that would allow commercial aquaculture in federal Gulf of Mexico waters. NOAA has announced it will neither approve nor disapprove of the GMFMC's plan to begin aquaculture permitting. NOAA's failure to approve or disapprove of the plan will likely ensure the exact opposite of its stated objection – a consistent federal programming scheme.

### A. Action by the Gulf of Mexico Fishery Management Council

The Gulf of Mexico Fishery Management Council announced its intent to amend its fishery management plans (FMPs) covering red drum, reef fish, and stone crab to allow commercial aquaculture in the Gulf.<sup>144</sup> The Council consists of seventeen voting members, many of whom are chosen by the United States Secretary of Commerce upon nomination by the governor of each participant state.<sup>145</sup> Other members include the principal state official with marine fishery responsibility and the NMFS regional director for the geographic area.<sup>146</sup> Each voting member, several of whom represent commercial and recreational fishing interests, serves a three year term and can only serve three consecutive terms.<sup>147</sup> The Council is required under the Magnuson-Stevens Act to prepare and submit to the Secretary a fishery management plan for each fishery under its authority that requires conservation and management, and amendments to each such plan.<sup>148</sup> Public hearings are required before amendments to fishery management plans can be approved by the Secretary.<sup>149</sup> A fishery management plan has to specify, among other things, the number of catch allowable among any given regulated species in order to prevent overfishing and allocate that number of catch between commercial and recreational fishing interests.<sup>150</sup>

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144. See Draft Amendment, *supra* note 15.

145. 16 U.S.C.A. § 1852(a)(1)(E), (b)(2)(c) (2006).

146. *Id.* § (b)(1).

147. *Id.* § (b)(2)(E)(3).

148. *Id.* § (h)(1).

149. *Id.* § (h)(3).

150. 16 U.S.C. § 1853 (2006).

The Council has to amend its FMPs to include commercial aquaculture based on an opinion letter of the NOAA's General Counsel that aquaculture constitutes "fishing" as defined in the Magnuson-Stevens Act.<sup>151</sup> Since the Council can control "fishing" operations only through a fishery management plan, the plans administered by the Council must be amended.<sup>152</sup> The Council acknowledges that an increase in domestic aquaculture production may not lessen global marketplace competition for aquaculture products (and presumably, its harmful economic impacts on Gulf fishermen).<sup>153</sup> However, the Council intends to go forward with its plan to create a regional permitting process for commercial aquaculture "to increase the maximum sustainable yield and optimum yield of federal fisheries in the Gulf of Mexico by supplementing the harvest of wild caught species with cultured product."<sup>154</sup> The permitting scheme would require a National Marine Fisheries Service permit to operate a facility in the Gulf EEZ.<sup>155</sup>

Four alternatives were offered as to the types of species available for possible permitting. Those options include:

- 1) an option to raise non-native species;
- 2) an option to raise most species currently managed by the Council (excluding spiny lobster, stone crab, corals, and shrimp);
- 3) an option to raise most species currently managed by the Council plus spiny lobster and stone crab; and
- 4) an option to allow aquaculture of all marine species currently managed by the Council except shrimp and coral, including *highly migratory species*.<sup>156</sup> According to the Council, most reef fish could be raised in aquaculture systems, including cobia, mutton snapper, amberjack, red snapper, and red drum.<sup>157</sup>

Permit durations under the Draft Amendment can range from one year to indefinitely, although the current "preferred" alternative

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151. The Council gets this interpretation of "fishing" under the MSA from a legal opinion by General Counsel for the NOAA. Draft Amendment, *supra* note 15, at 6. "Fishing," under the MSA is defined as "(A) the catching, taking, or harvesting of fish; (B) the attempted catching, taking, or harvesting of fish; (C) any other activity which can reasonably be expected to result in the catching, taking, or harvesting of fish; or (D) any operations at sea in support of, or in preparation for, any activity described in subparagraphs (A) through (C)." 16 U.S.C. § 1802(16)(2006).

152. Draft Amendment, *supra* note 15, at 6.

153. *Id.* at xiv.

154. *Id.* at x.

155. *Id.* at 1.

156. *Id.* at xvi (emphasis added).

157. Draft Amendment, *supra* note 15, at 73.



is one that is effective for ten years, and renewable in five year periods thereafter.<sup>158</sup> This “preferred” alternative would limit aquaculture operations to cages and nets for rearing native Gulf species such as red snapper or grouper, and would not allow federal water offshore farming facilities for shrimp.<sup>159</sup> The “preferred” alternative would also require an assurance bond payable to the Council, an operational plan to manage genetic diversity and aquatic health, and environmental monitoring.<sup>160</sup> The National Marine Fisheries Service would be responsible for reviewing each request for a commercial aquaculture site on a case-by-case basis.<sup>161</sup>

Louisiana created a Platform for Marine Aquaculture Task Force “to assess the economic feasibility, environmental impact, and legal/regulatory considerations of utilizing offshore oil and gas platforms for culturing marine organisms in the Gulf.”<sup>162</sup> The task force found that “it is reported that the central [Gulf of Mexico] shelf contains the highest density of oil and gas production platforms in the world. Therefore, it is practical to consider that the use of existing GOM production platforms could prove beneficial in expediting the development of a mariculture [aquaculture] industry in Louisiana.”<sup>163</sup>

Currently, no permit applicants are seeking to construct offshore aquaculture operations in the Gulf EEZ.<sup>164</sup> However, commercial aquaculturists are seeking to utilize offshore oil platforms for their operations in other geographic areas. In 2003, the Hubbs-Sea World Research Institute leased part of an oil platform off the coast of California to conduct a feasibility study of the development of marine aquaculture using offshore oil platforms.<sup>165</sup> Also, in the early 1990s, scientists at Texas Sea Grant used an Occidental Petroleum

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158. *Id.* at 2.

159. Chris Kirkham, *Fish Farm Plans Under Scrutiny*, THE TIMES PICAYUNE (April 6, 2008). *See also*, Draft Amendment, *supra* note 15, at xvii.

160. *Id.* at xvi.

161. *Id.* at xvii.

162. *Id.* at 7. The PMATF was created following the passage of Louisiana House Concurrent Resolution No. 176 (HCR 176) (2004). Louisiana Coastal Management Program, ASSESSMENT & STRATEGY, 64, *available at* <http://www.dnr.louisiana.gov/CRM/COASTMGT/cup/noticer/spn2006.04.01/20060303.draft.pdf>

163. Louisiana Platforms for Mariculture Task Force, FINAL REPORT OF FINDINGS AND RECOMMENDATIONS TO THE LOUISIANA LEGISLATURE AND GOVERNOR, 10 (2005), *available at* [http://dnr.louisiana.gov/mariculture/final\\_report.pdf](http://dnr.louisiana.gov/mariculture/final_report.pdf).

164. Draft Amendment, *supra* note 15, at 14.

165. *Id.* at 13. This project has currently not been permitted, possibly because Crystal Energy, another lessee of the platform, began using it as an LNG import and regasification facility. *Id.* at 14.

Corp. platform to grow redfish; the cages were damaged, leading to escaped fish, after a severe Gulf storm.<sup>166</sup> Furthermore, the efforts to raise the redfish cost \$22 per pound; the fish themselves were only worth \$3.50 per pound on the open market.<sup>167</sup>

This partnership between oil companies and aquaculture companies has some troubling undertones. The projects operating on oil platforms “begin” as research projects; Hubbs Sea-World has eventual plans to turn its project into a commercial venture “using millions of dollars from fish sales to support the facility and its research.”<sup>168</sup> Oil companies have a vested interest – for instance, Chevron, the lesser of the Hubbs-Sea World platform, funded the institute’s start up costs, and offered \$10 million to run the institute for three years, hopefully avoiding the “substantial expense” of removing the oil platform completely.<sup>169</sup> A 500-acre, four platform oil and gas complex off the coast of Texas was approved for conversion from an oil site to an aquaculture site in 1999; since then (and after litigation), the Gulf Marine Institute of Technology has announced that it has all the permitting required to begin its production facility. Devon Energy Corporation (formally Seagull Energy) donated the platform with a \$5 million value to the company, which agreed to dismantle the platform at an estimated cost of \$2.5 million once it ceases its aquaculture operation.<sup>170</sup>

Oil companies are looking out for their best economic interests by shifting the cost of removing abandoned platforms to another potentially responsible party. However, research-oriented offshore aquaculture is *heavily* subsidized by the federal government. For example, in the Gulf of Mexico alone, Congress distributed more than \$300,000 to fund research projects.<sup>171</sup> Since 1999, the United States Department of Commerce has granted close to \$3 million to companies involved with offshore aquaculture and funded over \$9

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166. *Id.*

167. *Id.*

168. Dalton, *supra* note 78, at 502.

169. *Id.*

170. Gulf of Mexico Fishery Management Council, *Economic Impacts of Gulf Aquaculture Amendment*, n.4, available at [www.gulfcouncil.org](http://www.gulfcouncil.org).

171. Food & Water Watch, *Offshore Aquaculture Kept Afloat with Government Funding*, 9 (2007) available at [http://www.foodandwaterwatch.org/fish/fish-farming/offshore/problems/Offshore\\_aquaculture\\_kept\\_afloat\\_with\\_government\\_funding/](http://www.foodandwaterwatch.org/fish/fish-farming/offshore/problems/Offshore_aquaculture_kept_afloat_with_government_funding/) (detailing the amount and type of federal grant money devoted to aquaculture research programs over the past several years in all areas of the country in which near-shore aquaculture is currently practiced).

million in research.<sup>172</sup> The merging of oil interests and commercial aquaculture fishing interests, especially in areas in which the coastline has been undeniably affected by oil exploration and production activity, should be carefully scrutinized. Further, start-up expenses for commercial aquaculture will be considerable; federal subsidies for aquaculture may well create “Big Aquaculture” much like “Big Agriculture.”

The Council’s plan has been met with vocal opposition.<sup>173</sup> Food and Water Watch, a non-profit consumer advocacy group that has submitted several public comments to the proposed amendment, urged the GMFMC to slow down its current pace to finalize the plan.<sup>174</sup> Food and Water Watch stated that to push a measure through so quickly was “a failure of the fisheries management system and a flagrant disservice to the people whom [the Council] represents as a trustee of the Nation’s marine fisheries resources.”<sup>175</sup>

### *B. Proposed New Federal Legislation*

Comments on the Draft Amendment indicated the main concern was one of the environmental effects of having any open ocean aquaculture in the Gulf at all. However, few, if any, have discussed what possible enactment of the National Offshore Aquaculture Act<sup>176</sup> would do to the Council’s proposed plan. The Act (introduced by Rep. Nick Rahall (D. WV)) would establish an all-encompassing federal regulatory system for offshore aquaculture in the United States EEZ.<sup>177</sup> The Act follows on the heels of a similar attempt to introduce a regulatory program in 2005. The program would include financial support to an offshore aquaculture industry, the establishment of a permitting process, and research and development sup-

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172. *Id.*

173. The Mangrove Action Project, Letter to Gulf of Mexico Fishery Management Council on Offshore Aquaculture (Oct. 2007) [www.mangroveactionproject.org/news/current\\_headlines/letter-to-gulf-of-mexico-fishing-management-council-on-offshore-Aquaculture](http://www.mangroveactionproject.org/news/current_headlines/letter-to-gulf-of-mexico-fishing-management-council-on-offshore-Aquaculture); Food & Water Watch memo regarding the public hearing draft amendment (Jan. 2008) *available at* [www.foodandwaterwatch.org](http://www.foodandwaterwatch.org).

174. Press Release, Food and Water Watch, Gulf Council Ocean Fish Farming Plan Illegal (Jan. 17, 2008) *available at* <http://www.foodandwaterwatch.org/press/press-releases/gulf-council-ocean-fish-farming-plan-illegal/j>. Press Release, Food and Water Watch, Bad Ocean Fish Farming Plan Blocked (Jan. 31, 2008) *available at* <http://foodandwaterwatch.org/press/press-releases/bad-ocean-fish-farming-plan-blocked/>.

175. Food and Water Watch memo, *supra* note 173, at 2.

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

177. *See Id.* at § 2.

port.<sup>178</sup> Legislators are currently debating the Act in the House Subcommittee on Fisheries, Wildlife, and Oceans and the Senate Committee on Science, Commerce, and Transportation.<sup>179</sup>

The Act would authorize the Secretary of Commerce to issue offshore aquaculture permits and establish environmental requirements for commercial aquaculture activities.<sup>180</sup> Permits issued by the Secretary would exempt offshore facilities from regional fishery management council fishing regulations that restrict size, season, and harvest.<sup>181</sup> Such permits would be for twenty years (renewable in up to twenty year increments) and would specify the location of the commercial facility and the species to be grown.<sup>182</sup> The permitting process would require consultation with the regional fishery management councils established by the Magnuson-Stevens Act and adherence to environmental standards designed to safeguard genetic resources and preserve marine ecosystems.<sup>183</sup> In a departure from an option of the currently proposed Gulf of Mexico Fishery Management Council plan, however, the Act would require “that marine species propagated and reared through offshore aquaculture be species native to the geographic region unless a scientific risk analysis shows that the risk of harm from the offshore culture of non-indigenous or genetically modified marine species is negligible or can be effectively mitigated.”<sup>184</sup> Under the Act, if any State elected to “opt-out” of offshore aquaculture, no facilities could be permitted within twelve miles of that state’s coastline.<sup>185</sup>

According to Wayne Swingle, the former Director of the Gulf of Mexico Council,

[t]he Congressional act when passed would supersede the amendment rule. The act would likely apply to all the finfish and most invertebrates, whereas the amendment will apply to only the fish managed by the

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178. *Id.*

179. National Offshore Aquaculture Act of 2007, S. 1609, 110th Cong. (2007) (last major subcommittee hearings held 7/12/2007).

180. U.S. DEP’T OF COMM, NOAA Aquaculture Program, *Highlights of the 2007 National Offshore Aquaculture Act*, March 12, 2007, available at [www.aquaculture.noaa.gov](http://www.aquaculture.noaa.gov). The Act may be dead in the 110th Congress, but the author anticipates another re-introduction.

181. *Id.*

182. *Id.*

183. H.R. 2010 at § 4(a) & (d)(4).

184. *Id.* at § (a)(4)(E).

185. Highlights, *supra* note 180.

council, i.e., about 70 species. All firms operating under the amendment likely would apply for permits issued under the act.<sup>186</sup>

The possibility of “superseding” raises some questions. As it currently stands, the 2007 Act contains no provision “grandfathering” in permits possibly issued by the Gulf of Mexico Council or any other regional fishery council. The Council’s Draft Amendment states that it wants to implement its permitting plan because the national legislation is currently only in debate, and even if enacted into law in the near future, would take several years to implement.<sup>187</sup> However, a question may arise as to what “interest” a facility operator would have in continuing a regional permit, if for instance, a federal permit over the same facility were subsequently denied.<sup>188</sup> For example, if the Gulf Council’s plan passes, and a commercial facility is granted a 10 year permit under the “preferred” alternative, and then the same company is denied a federal permit if the Act passes, such company could make an arguable takings claim. A permit from the Council could contain a disclaimer stating that the holder has no vested property right; however, the likelihood that a company would invest significant financial and physical resources into a facility requiring a permit, when such permit could be easily superseded, is slim.

Furthermore, the Act purports to exclude “offshore aquaculture conducted in accordance with permits issued pursuant to this Act” from the definition of “fishing” in the Magnuson-Stevens Act.<sup>189</sup> This deliberate exclusion highlights an interesting issue. According to the Gulf Council, it has the authority to amend its fishery management plan to create a permitting program for open-ocean aquaculture *because* “fishing” as defined in the Magnuson-Stevens Act includes aquaculture.<sup>190</sup> The Act, however, would exclude aquaculture from the definition of “fishing,” which could indicate that Congress did not intend, in passing the Magnuson-Stevens Act, for

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186. Email from Wayne Swingle, former Executive Director, Gulf of Mexico Fishery Management Council (March 24, 2008) (on file with author).

187. Draft Amendment, *supra* note 15, at 16-17.

188. This mirrors problems that have arisen on the strictly federal level concerning the bifurcation of construction permits from operating permits. It seemed unlikely in a case where a private entity spends millions of dollars to construct a facility, with a permit from the United States government, that the United States would deny that facility an operating permit. In this situation, however, the “permit-granting” interests are both federal government and “a quasi-federal agency,” which likely have divergent interests.

189. H.R. 2010 at § (4)(d)(4).

190. *See supra*, note 150 and accompanying text.

the definition of “fishing” to include commercial open-ocean aquaculture.

To the extent “fishing” does include aquaculture upon passage of the Act, from what source would the GMFMC derive its authority? “Fishing,” as defined by the Magnuson-Stevens Act, includes the catching, taking, or harvesting of fish or an attempt to take, catch, or harvest fish. Irrespective of the NOAA’s assertion (through its General Counsel) that “fishing” includes open-ocean aquaculture; the Council may not have the authority to amend its fishery management plan to provide for a region-wide permitting program in the Gulf of Mexico EEZ. In either case, failure to pass the Act should spark a debate about whether aquaculture is actually included in the definition of the term “fishing.” Congress’s deliberate exclusion of aquaculture from “fishing” in the 2007 Act could provide evidence in a legal action challenging the Council’s statutory authority. One could argue that “harvesting” of fish includes commercial aquaculture. However, such a decision should be left to the courts or to Congress. Even though the construction of the term “harvesting” could reasonably include commercial aquaculture and the NOAA is entitled to a certain amount of deference in construing the statute it is charged with administering, commercial aquaculture will take such a large effort and expenditure of money and resources that any federally supported aquaculture actions should be more carefully considered by Congress.

NOAA, however, has stated it believes current federal laws provide adequate authority to regulate aquaculture. Interestingly, NOAA took this position while simultaneously refusing to approve or disapprove of the GMFMC’s plan, stating,

[w]e believe that permitting plans of this scope should be governed by a national policy. In the absence of a consistent national policy, it was not prudent to take action on the plan at this time.<sup>191</sup>

NOAA’s failure to take action does the exact opposite of its stated intention to develop a consistent national policy; it instead ensures that the development of aquaculture in federal waters will be regionally fragmented.

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191. Press Release, National Aquaculture and Atmospheric Administration, NOAA to Pursue National Policy for Sustainable Marine Aquaculture, Press Release, National Aquaculture and Atmospheric Administration (Sept. 3, 2009).

## VI. CONCLUSION

A clear conflict exists between the interests of the Gulf of Mexico Fishery Management Council on the one hand, and the federal government on the other. Furthermore, although the evidence is mixed, one could easily find that current technology is not adept enough to adequately mitigate the possible environmental damage from open ocean aquaculture, especially in the Gulf of Mexico. Both the NOAA and the governing bodies of some coastal areas, however, are intent on pushing forward with an open-ocean aquaculture plan. At this point, the only realistic option is not to stop both plans (which is likely impossible), but to enact the plan that best serves the goals of environmental conservation of scarce resources while opening the ocean for commercial purposes. Because NOAA has chosen to not approve or disapprove of the GMFMC Plan, recourse to the courts may be needed to determine precisely what regulatory authority NOAA has to regulate commercial aquaculture in federal waters. Congress could also effectively end the GMFMC's commercial aquaculture plan by specifying that "fishing" as defined in the Magnuson-Stevens Act, does not include commercial aquaculture. At the moment, the best plan seems to be a comprehensive federal regulatory scheme. Such a scheme would safeguard the interests of all coastal areas, by preventing a race to the bottom for commercially favorable environmental laws.

What is it about the ocean that seems to inspire such appreciation? It may be that unlike land, one cannot stake a clear marker in the ocean. For the most part, one cannot mark "her territory" in the ocean, as the United States has done on land, in foreign nations, and even on the moon. It is the haven of mysterious creatures untamable or commercialized by man, at least, until now.