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Grotius, Ocean Fish Ranching, and the Public Trust Doctrine: Ride 'Em Charlie Tuna

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Hope M. Babcock*

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I. INTRODUCTION

Are the fishermen to be driven from their fishing-grounds, are the people to be deprived of food, that a few men may be made rich out of the public treasury of the sea? The law locks up the man or woman who steals the goose from the common; but leaves the greater villain loose who steals the common from the goose.

Seventy percent of the world’s fish populations are in serious decline; some have been fished to near extinction. While domestic and international efforts are underway to curb the rate at which the remaining fish are being depleted, the demand for fish appears to be outstripping these initiatives—before they can take hold, the fish may be gone. In response to this increasingly dire situation, many countries, including the United States, have turned to fish farming in hope of taking pressure off of certain wild stocks of fish while still meeting consumer demands for them. More recently, non-U.S. fish farmers have moved the locus of their activities from land and coastal waters to the open oceans. In this country, ocean fish ranching is still at the experimental stage, but hopes are high that it could become commercially profitable in


3. See discussion infra Part I.A.
the United States’ Exclusive Economic Zone ("EEZ").\(^4\) One problem hindering the development of a robust ocean fish ranching industry in the United States is the absence of a comprehensive regulatory program. Increasing pressure to develop the ocean fish ranching industry and the current structure of the industry, however, may mean that for the foreseeable future ocean fish ranching will happen in a regulatory vacuum.

While much has been written about the adverse environmental and economic impacts of fish farming,\(^5\) including concerns about moving these activities offshore,\(^6\) little has been written about the property law implications of ocean fish ranching. Viewing ocean fish ranching through a property lens invites consideration of common law property concepts like the public trust doctrine. The public trust doctrine offers a set of useful principles that could be applied to ocean fish ranching until the government develops a suitable regulatory framework. Because the public trust doctrine traditionally applies only to coastal waters, though, extending it to the EEZ requires a new legal basis. This article proposes two such theoretical bases: one founded on the public domain status of EEZ, the other in the extension of state common law to the EEZ.

Before expanding on the reasons why the public trust doctrine could and should apply to ocean fish ranching, the article provides background information on the status of the world’s fisheries, the

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4. The United States EEZ “extends 200 nautical miles offshore” and is the “largest” EEZ in the world. Final Report on the U.S. Commission of Ocean Policy, An Ocean Blueprint for the 21st Century 5 (2004), available at http://www.oceancommission.gov/documents/full_color_rpt/000_ocean_full_report.pdf. Spanning over 13,000 miles of coastline and containing 3.4 million square nautical miles of ocean (equivalent to 44.2 square miles), the U.S. EEZ is “larger than the combined land area of the 50 states.” Id. In 1966, the United States extended its exclusive jurisdiction over fisheries to twelve nautical miles, which it then further extended in 1976 “by legislating a fishery conservation zone” 200 miles from the coast. In 1983, this zone was “absorbed” into the U.S. EEZ. Katrina Miriam Wyman, From Fur to Fish: Reconsidering the Evolution of Private Property, 80 N.Y.U. L. Rev. 117, 153 n.89 (2005).


growth of the fish farming industry and its movement offshore, environmental and economic concerns, and the existing regulatory picture. The second part of the article explains the concept of common pool resources and how open access has contributed to the decline in wild fish stocks and prompted the creation of property-based responses like individual fishing quotas ("IFQs"). The third section describes the public trust doctrine and develops two bases for the doctrine's application to activities occurring within the EEZ: (1) the public domain nature of the EEZ to which federal common law might apply; and (2) the potential extension of state common law beyond state waters. The first basis requires an argument that there is a federal common law public trust doctrine that attaches to public lands, and the second presumes that the federal laws governing the EEZ include a role for state common law's continuing regulatory presence.

Professor William Buzbee's work on the "regulatory commons," described in the fourth part of the article, underscores the need to make these doctrinal leaps. He explains why regulatory commons are counter-productive yet self-perpetuating. In turn, this article shows how ocean fish ranching is an example of such a commons and argues that the cure for it is not privatizing the resource. The article concludes by explaining how the application of the public trust doctrine will end the ocean fish ranching regulatory commons and why applying the doctrine, until effective regulation eliminates the potential adverse environmental and economic effects of these activities, makes good policy sense, and is preferable to market-based solutions.

II. BACKGROUND

This part of the article discusses the collapse of finfish stocks and the finfish industry, the minimal success of governmental efforts to stop the downward spiral in wild fish stocks, the concomitant growth in fish farming, and the gradual movement of these activities offshore to lessen their impacts on the terrestrial and nearshore environments. The part also describes the adverse

environmental effects of raising fish in confined pens and fish farming's economic impact on local fishing interests and their communities. Finally, this section sets out the current legal framework for regulating ocean fish farming and the problems that this patchwork of laws creates.

A. The Collapse of Finfish Stocks and the Finfishing Industry

Why does everyone overfish, even to the detriment of the body of water and its living stocks? According to the economic account, everyone does so because each user knows that, even if any particular individual refrains from fishing so intensely, everyone else will continue to fish, and in fact the other might just fish a little bit more, to take up the slack left by the moderate fisher. The moderate fisher, in short, would just be a sucker...  

"Ocean fisheries are one of the world’s most important resources."9 Fisheries are a “major source of both sustenance and employment."10 As a reflection of their importance, the global consumption of fish has “almost doubled in under half a century."11 Although the National Oceanic & Atmospheric Administration (“NOAA”)12 has made a little progress rebuilding some depleted fisheries in this country, it has not been able to stop the widespread over-fishing or other activities, such as habitat loss

10. Id. See also Montserrat Gorina-Ysern, World Ocean Public Trust: High Seas Fisheries After Grotius—Towards a New Ocean Ethos?, 34 GOLDEN GATE U. L. REV. 645, 705 n.227 (2004) (citing Asian Development Bank statistics that “more than one billion people around the world depend on fish for their primary source of protein”, and approximately 50 million people “rely” on some aspects of the small scale fishing industry “for their livelihoods”). Moreover, fish byproducts are used in cosmetics, animal feeds, fertilizers, detergents, and jewelry as well as in industrial and pharmaceutical products. Id.
and pollution that adversely affect fish stocks.\textsuperscript{13} In 2003, NOAA Fisheries reported that eighty-six stocks were over-fished and sixty-six species were in the process of being over-fished.\textsuperscript{14} According to Donna Christie "only" 25\% of "[main fish] stocks or species groups are underexploited or moderately exploited," 47\% are "fully exploited," and 18\% are "overexploited"; the remaining 10\% "are either significantly depleted or recovering from depletion."\textsuperscript{15} Moreover, "nine of the world's seventeen major fishing grounds are in serious decline; four have been commercially fished out."\textsuperscript{16} "The unthinkable has come to pass: The wealth of oceans, once inexhaustible, has proven finite, and fish, once dubbed the 'poor man's protein,' have become a resource coveted—and fought over—by nations."\textsuperscript{17}

There are many causes of the dire situation of the world's
fisheries, but this article focuses primarily on the inability of fishers to "control their selfish impulses to overfish," thus acting out Hardin's tragedy, in which the rational economic individual is

18. Other commonly cited reasons for the decline in fish species are loss of spawning and nursery habitat, coastal development, overfishing, pollution, invasive non-native species, and global climate change. See Robin Kundis Craig, Protecting International Marine Biodiversity: International Treaties and National Systems of Marine Protected Areas, 20 J. LAND USE & ENVT'L. L. 333, 345-48 (2004-2005) (mentioning land-based water and air pollution and ocean dumping among the sources of harmful pollution); Dean Scott, Scientists Say Reports of Rising Sea Levels Signal Possible Effects on Fish Population, 37 Env't Rep. (BNA) 890 (Apr. 28, 2006) (reporting on congressional testimony by NOAA's director for scientific programs to the Senate Commerce Subcommittee of Global Climate Change identifying global climate change as one of the factors that could have a "long term influence" on marine ecosystems and world fish populations by precipitating a decline in plankton at the bottom of the aquatic food chain.); Editorial, Acid Oceans: Scientists Identify Another Potentially Devastating Consequence of Failing to Control Greenhouse Gases, WASH. POST, July 6, 2006, at A20 (discussing a recent report by federal scientists and university researchers "highlight[ing] . . . [the] potentially devastating ecological consequences" of the oceans' increased acidification from carbon emissions); Editorial, Sea Rescue, N.Y. TIMES, July 17, 2006, at A16 (identifying the problems of "multiple and overlapping government agencies," coastal sprawl, and the failure to ratify the Law of the Sea Treaty as factors making it "all the more urgent that Congress get right the one recommendation that has survived Washington's torpor: a much-needed update of the Magnuson-Stevens Act").

19. Victor B. Flatt, Enron Story and Environmental Policy, 33 Envtl. L. Rep. (Envtl. L. Inst.) 10485, 10492 (2003). One of the most puzzling aspects of the over-fishing problem has been the problem fishers have self-regulating given the dire consequences of the collapse of a fishery. Some blame this problem on the tragedy of the commons and the contribution of government regulations to that tragedy, assuming that "as long as the rule of capture prevails," fisherman are trapped in a downward spiral of consumption that they "cannot break out of . . . unless they have a private right to harvest an amount of fish which they can use or sell." Alison Rieser, Prescriptions for the Commons: Environmental Scholarship and the Fishing Quotas Debate, 23 HARV. ENVT'L. L. REV. 393, 399 (1999). See also Michael C. Blumm & Lucas Ritchie, The Pioneer Spirit and the Public Trust: The American Rule of Capture and State Ownership of Wildlife, 35 ENVT'L. L. 673, 690 (2005). ("By awarding the first taker the exclusive rights to the resource, an unrestricted rule of capture encouraged resource exploitation . . . . By rewarding efficient capture, America's . . . policies promoted investment in capture technology, encouraging hunters to purchase bigger nets, better guns, and more ammunition."). While some United States fishing communities have been able to regulate themselves, see, e.g., James M. Acheson, The Lobster Fiefs Revisited: Economic and Ecological Effects of Territoriality in the Maine Lobster Industry, in THE QUESTION OF THE COMMONS, supra note 1, at 371, most have not, and according to Thompson have "actively fought" stronger management and enforcement efforts that would reduce catches. Thompson, supra note 8, at 248.

20. Garrett Hardin, The Tragedy of the Commons, 162 SCI. 1243 (1968). See also Thompson, supra note 8, at 242 (noting that while not consuming as much of a commonly available resource as possible is in the interest of "[s]ociety as a whole," preserving the resource makes "one a patsy" where "no one can bind anyone else's actions . . . . The high road leads nowhere," even though "[t]he cumulative results of reasonable individual choices is collective disaster"). Many common property scholars, however, do not think that there is a tragedy of the commons, or, if there is one, that it is inevitable. See, e.g., Alison Rieser, Property Rights and Ecosystem Management in U.S. Fisheries: Contracting for the
driven inexorably to extract the last wild fish from the ocean commons.\textsuperscript{21} Fishers have additionally over exploited unregulated fisheries by fishing “down the food web,”\textsuperscript{22} and their uncontrolled bycatch has wiped out entire populations of untargeted species.\textsuperscript{23} Increased fishing capacity and more efficient technologies are outpacing the capacity of stocks to replenish themselves, as indicated by the “recent periodic leveling-off or decline in total marine catch,” and are making matters worse.\textsuperscript{24} “Modern technologies now enable fisherman to go wherever the fish are...
found and to identify, track, and catch the fish with a relentless efficiency. While intense "high seas fishing for straddling stocks and highly migratory species" like tuna and various shark species has received "recent international attention," over 90% of the fish are within 200 nautical miles of the U.S. coastline and "distant" or high seas fishers contribute only 5% to total marine landings.

As fish stocks decline, governments, such as the United States, take various forms of preemptive action against fishers, such as restricting types of fishing gear, the hours/day or days/month of fishing, the size of a fisher's daily or annual catch, and even closing fishing areas to allow the remaining fish stocks to recover. While, these initiatives financially hurt fishers, even "driv[ing] some out of business," the impact of declining catches on local fishers and fishing communities can be just as devastating. Many of these fishers have over-capitalized their investments in their boats and

25. Thompson, supra note 8, at 247.
27. See Abby Goodnough, A Favorite Florida Fish is Off the Menu Till Next Year, N.Y. TIMES, Oct. 16, 2005 (reporting on the temporary closing of the Gulf of Mexico commercial grouper fishery and limitations placed on recreational fishing for grouper); Seth Macinko, Public or Private?: United States Commercial Fisheries Management and the Public Trust Doctrine, Reciprocal Challenges, 33 NAT. RESOURCES J. 919, 922 (1993) (describing limited entry as a way to "target perceived irrationalities in so-called 'derby style' open access fisheries" where there is a "competitive 'race for fish,'" which "spurs continual reinvestment (of captured economic rent) in technology in pursuit of competitive advantage," leading to "both economic and biological consequences that are deemed undesirable"). But see OSTROM, GOVERNING THE COMMONS 173-77 (1990) (documenting the failure of various regulatory efforts by the Canadian government when applied to a self-regulating Nova Scotia fishing village); Ralph Townsend & James A. Wilson, An Economic View of the Tragedy of the Commons, in THE QUESTION OF THE COMMONS, supra note 1, at 320 (criticizing "extensive rule structure[s]" required to reduce fishing effort to achieve sustainable fisheries because they lead to "high enforcement costs and/or fishing effort that exceeds the level desired"); Evelyn Pinkerton, Intercepting the State: Dramatic Processes in the Assertion of Local Co-Management Rights, in THE QUESTION OF THE COMMONS, supra note 1, at 344 (saying that in the case examined, "it is the state that permits and even creates the resource problem; it is the community, including local fisherman, that holds the problem in check"); DeLuca, supra note 13, at 728 (saying such restrictions "frequently resulted in drastically abbreviated fishing seasons ('derbies') causing 'over-capitalization of the [fishing] fleet, high rates of bycatch, highgrading, ghost fishing, and unsafe fishing practices which resulted in loss of boats and lives" (citations omitted)).
29. See McCay, supra note 1, at 206 (saying overfishing deprives fishermen of "common-use rights," and as such can also be seen as "a social tragedy"); S.F. Baird, supra note 1, at 221 ("T]he privilege of fishing where no fish are to be found, is equivalent to no right to catch fish.").
fishing gear as they race to scoop up the remaining fish. So when a fishery collapses, the effects on those communities are particularly severe. The most spectacular illustration of what happens when a fishery collapses was the collapse of the Newfoundland groundfishery in the early 1990s. When there are a limited number of fish in the ocean and more individuals enter the industry, those already fishing have to "race" harder to "achieve a return on their investment." The result is that "overcapitalization and overcapacity increase, and the resource, however renewable, is overexploited and depleted."

B. The Growth of the Fish Farming Industry

People who go fishing are the last commercial market hunters in the ocean, and as such, they are the last to enter an industry that is "open access." Over-capitalization is a response to the fishing version of the tragedy of the commons as participants in the race to capture the last fish invest in larger boats and more effective fishing gear. See Pinkerton, supra note 26, at 350 (describing the over-capitalization of a Canadian mobile seine fleet in its search for more fish). See also Townsend & Wilson, supra note 26, at 313 (noting that "[i]n nearly every fishery examined, economists found excessive investment in harvesting capacity, low economic returns to fishermen, and increasing signs of stock decline which they attributed to the institution of open access"); Macinko, supra note 26, at 922 (saying "[o]vercapitalization represents the tragedy of rent dissipation, an unnecessary diversion of capital and labor that could be released to more productive sectors of the national economy.").

30. Over-capitalization is a response to the fishing version of the tragedy of the commons as participants in the race to capture the last fish invest in larger boats and more effective fishing gear. See Pinkerton, supra note 26, at 350 (describing the over-capitalization of a Canadian mobile seine fleet in its search for more fish). See also Townsend & Wilson, supra note 26, at 313 (noting that "[i]n nearly every fishery examined, economists found excessive investment in harvesting capacity, low economic returns to fishermen, and increasing signs of stock decline which they attributed to the institution of open access"); Macinko, supra note 26, at 922 (saying "[o]vercapitalization represents the tragedy of rent dissipation, an unnecessary diversion of capital and labor that could be released to more productive sectors of the national economy.").

31. Katherine Marvin makes the point that although large investments in outfitting their boats "means that there are steep supply curves for fishermen" and that they receive low individual economic rent, the rise in costs must be "equally steep" before they will stop fishing, even when the "resource yield has started to decline." Katherine A. Marvin, Note, Protecting Common Property Resources Through the Marketplace: Individual Transferable Quotas for Surf Clams and Ocean Quahogs, 16 VT. L. REV. 1127, 1145 n.147 (1992).


33. Marvin, supra note 30, at 1145. One effect of the need to venture further offshore to catch fish has been an increase in the amount of fuel the fishing industry consumes. According to a recent report in the New York Times, "if the fishing industry were a country, it would rank with the Netherlands as the world's 18th-largest oil consumer" and "is the only major industry in the world that is getting more and more energy-inefficient," adding to the "list of concerns about fishing as a destructive practice." Cornelia Dean, Fishing Industry's Fuel Efficiency Gets Worse as Ocean Stocks Get Thinner, N.Y. TIMES, Dec. 20, 2005, at F3. However, "growing fish in aquaculture pens can be less energy efficient than fishing." Id.

34. Marvin, supra note 30, at 1145. Marvin also criticizes the adoption of "conservation measures" like total industry quotas, which she says merely drive fishermen to race harder and invest in more effective gear and the government to tighten the restrictions "in a constant race with the ingenuity of the regulated." Id. at 1146. Restrictions can also create unnecessary hazards and enforcement problems. Id. at 1147-48.
the world. . . . We don't do that anymore on land.  

As stocks of wild fish decline, aquaculture has increased. The reliance “on aquaculture to bridge the gap” between the supply of, and demand for, fish is “most acute in the developing world where fish protein provides between 19% and 50% of all animal protein consumed.” But farmed fish also offers the potential of a plentiful supply of cheaper food in developed countries. Additionally, aquaculture provides employment to millions of persons in the developing world. As a result, aquaculture’s growth is outpacing all other animal-based sectors of the world’s economy, including traditional fisheries.

In this country, aquaculture presents a way to take pressure off of wild stock and reduce the United States’ seafood trade deficit of nearly seven billion dollars annually. Farm fish also provide

35. Juliet Eilperin, Fish Farming’s Bounty Isn’t Without Barbs, WASH. POST, Jan. 24, 2005, at A1, A4 (quoting Sebastian Bell, Executive Director of the Maine Aquaculture Association). See also Roy Whitehead, Jr., Catherine Gould, & Walter Block, The Value of Private Water Rights: From a Legal and Economic Perspective, 9 ALB. L. ENVTL. OUTLOOK 313, 338 n.177 (2004) (saying “as humans moved from hunting to farming on the land, they should also move from fishing to farming in the oceans. Man will not arrive at a modern system of economics on the oceans until this move is made.”).

36. “Aquaculture is the fastest growing sector of the world food economy, increasing by more than 10% per year,” and in 2003 counted for more than thirty percent of all fish consumed. Press Release, Sea Web, supra note 4.

37. Shannon R. Wilson, Sustainable Aquaculture: An Organizing Solution in International Law, 26 T. JEFFERSON L. REV. 491, 496. See also id. at 495-496 (saying ninety percent of aquaculture consists of “small scale [projects] in developing countries to meet dietary needs,” and 81% occurs in “Low Income Food Deficit Countries,” mostly in Asia and Africa).

38. See id. at 497 (saying developed countries will rely on aquaculture to supplement fish supply and reduce fish product prices).

39. Id. at 498. Wilson notes, however, that aquaculture for export of fish products is “often undertaken by foreign nationals, rather than by local individuals with a vested interest in the local economy.” Id. See also Schatzberg, supra note 5, at 255 (saying that the “startup capital, skill, and time” required to run an aquaculture operation make the “industry ripe for consolidation under multinational companies” and, therefore, aquaculture will not necessarily “reincarnate a fishing community that once prospered from a now-depleted resource”); id. (saying while “fish processing and other land-based activities [associated with aquaculture] could create jobs in coastal areas, raising salmon as an employee of a large farm is quite a different way of life than catching them as the owner of a small boat.”).

40. Wilson, supra note 36, at 498.

41. See Craig, supra note 5, at 165 n.10 (saying aquaculture reduces pressure on wild stocks and helps with their recovery). Schatzberg disputes that this is actually occurring with respect to wild salmon. Schatzberg, supra note 5, at 254.

42. U.S. COMMISSION ON OCEAN POLICY FINAL REPORT, supra note 3, at 330. According to the National Sea Grant College Program, the United States imports greater
"the seeds" for replenishing depleted stocks. Aquaculture can be an "attractive source of revenue and employment" to depressed fishing communities and has lowered the price of once very costly seafood products like shrimp and salmon.

Experts maintain that "worldwide fisheries production will be inadequate to meet the needs of the world's population, without supplementation through aquaculture," a conclusion which may account for the industry's rapid growth. While the total catch of wild fish worldwide has "leveled off" at slightly less than 100 million tons, total global aquaculture production more than doubled in both weight and value from 1988 to 1997. By 1997, 28% of the global seafood market consisted of aquaculture than 60% of the fish and shellfish it consumes annually. Press Release, Sea Grant, Science Supporting Sustainable Marine Aquaculture 1 (2004) (on file with author), available at http://govdocs.aquake.org/cgi/reprint/2005/801/8010130.pdf. This deficit is "the largest for any agricultural commodity," and, according to the FDA, the value of imported shrimp, Atlantic salmon, and tilapia "were worth as much as the combined exports of the U.S. broiler and hog industries." Craig, supra note 5, at 166,166 n.13.

43. See Press Release, Sea Grant, supra note 41, at 2 (citing "the potential for rebuilding collapsed wild fish stocks through the use of aquacultured fish"). See also Craig, supra note 6, at 167 (listing "wild stock enhancement" as a "potential purpose[]" for aquaculture).

44. Firestone & Barber, supra note 5, at 708. See also Wilson, supra note 37, at 499 (saying aquaculture industry employs nearly 100,000 people, which is projected to increase to 500,000 by 2025"). But see MICHAEL WEBER, SEAWEB AQUACULTURE CLEARINGHOUSE, WHAT PRICE FARmed FISH: A REVIEW OF THE ENVIRONMENTAL & SOCIAL COSTS OF FARMING CARNIVOROUS FISH EXECUTIVE SUMMARY 2 (2003), http://www.seaweb.org/resources/aquaculturecenter/documents/Carnivorous_Fish.pdf (saying improvements in salmon farming methods have decreased employment opportunities, while "lower production and market prices . . . have contributed to financial instability in salmon fishing fleets," forcing many fishers out of business "with dramatically negative effects on the economies of rural coastal communities.")

45. Eilperin, supra note 34, at A04 (saying the cost of farmed salmon has dropped from approximately seven dollars per pound to two dollars per pound). But see Wilson, supra note 36, at 497 (saying "[d]espite aquaculture's contribution to the world's fish supply, the retail cost of fish has not decreased" because of demand outpacing supply, declining wild fisheries, high operational costs in a "new" industry, and the willingness of some "to pay exorbitant prices" for some species like salmon and shrimp).


47. Eilperin, supra note 34, at A04. See also Firestone & Barber, supra note 6, at 708 (noting fish landings leveled off during the 1990s to eighty-five to ninety-five million metric tons a year). One Canadian company, New Brunswick's Cooke Aquaculture, processes 100,000 pounds of farmed fish per day, seven days a week and, within twenty-four hours, can transport it anywhere in the United States. 48. Firestone & Barber, supra note 5, at 706.
products. 49 Worldwide, the aquaculture industry is worth $40 billion. 50

In the United States, the industry is worth "nearly" one billion dollars 51 and, in North America, has increased in size an average of 3.6% per year from 1984 to 2001. 52 This is so, even though the United States' aquaculture industry "supplies less than 10% of the nation's seafood demands." 53 The vast majority of this increase in sales was from farmed fish like Atlantic and Pacific salmon and shrimp. 54 As of 1997, the aquaculture industry consisted of approximately 5000 aquaculture facilities located in every state and territory. 55 It is one of "several growing segments" of domestic agriculture. 56 Some predict that aquaculture will supply up to 25% of all seafood consumed in this country in the next twenty years. 57

Reflecting the importance of aquaculture to the country's economy, the federal government is actively encouraging the industry's development. 58 The U.S. Department of Commerce is

49. Id.
50. Craig, supra note 5, at 166.
51. Id. at 167.
52. Firestone & Barber, supra note 5, at 706. The global average aquaculture production increased at a yearly rate of nine percent during the same time period. Id.
53. Craig, supra note 5, at 167 (quoting OFFICE OF WATER, EPA, Aquaculture, in TURNING TO THE SEA: AMERICA'S OCEAN FUTURE, available at http://www.publicaffairs.noaa.gov/oceanreport/ (last visited Nov. 2, 2006)). The United States is eleventh in the world in aquaculture production, Firestone & Barber, supra note 5, at 707, producing 1 to 2% of the world's total, Eilperin, supra note 22, at A04. At the same time, it ranks third in the consumption of seafood. Firestone & Barber, supra note 6, at 707.
54. Craig, supra note 5, at 167-68. Other aquaculture products include oysters, clams, ornamental fish, baitfish, and crustaceans. Id. As an illustration of the growing importance of the industry, see the six-page advertisement in the New York Times touting the advantages of ocean farmed salmon. Ocean-Farmed Salmon: A Healthy Choice for Our Times and Your Table, N. Y. TIMES MAG., Dec. 4, 2005, at 91-96.
55. Craig, supra note 5, at 168. Sixty-eight percent of aquaculture acreage is in the south, and the south "account[s] for 65% of the value of aquaculture products sold." Id. The north-central states are the least active aquaculture area of the country. Id. at 168-69.
56. Id. at 168.
57. See Press Release, Sea Grant, supra note 41, at 1 (saying that aquaculture has the "potential to supply up to 25 percent of all seafood consumed by its citizens within the next 20 years"). According to an article in the Washington Post, by 2025 one half of the fish consumed worldwide will be farm-raised. Eilperin, supra note 22, at A04.
58. See Craig, supra note 5, at 169-170 (describing various federal initiatives like the 1980 National Aquaculture Development Act, amended in 1985, and federal agency funding initiatives like National Sea Grant College Program funding that develops technology, the impact of which totals $100 million per year and provides thousands of jobs).
"promoting a five-fold increase in U.S. aquaculture production" by 2025.\textsuperscript{59} Towards the end of the last century, the National Marine Fisheries Service (NMFS) spent nearly ten million dollars annually for "the operation of 25 major salmon hatcheries in the Columbia River Basin" and almost twenty million dollars for "salmon enhancement projects in Alaska." \textsuperscript{60} In FY1994 and FY1995, the Northeast Fishing Industry Grants program gave a total of $3.39 million for "aquaculture-related projects" for the purpose of "creating commercial development opportunities for displaced New England fishermen."\textsuperscript{61} In its 2001 Fisheries Strategic Plan, NOAA cited as the "fourth objective" for sustainable fisheries the promotion of the development of "robust and economically sound aquaculture."\textsuperscript{62}

While the United States freshwater aquaculture industry is booming,\textsuperscript{63} the coastal or nearshore industry is not; it currently provides only 15\% of total domestic aquaculture production.\textsuperscript{64} One of the first commercial open-ocean aquaculture operations began in 2001 with the transfer of what had been a public project in the waters off Hawaii to a private firm.\textsuperscript{65} Most other offshore aquaculture activities are "in the pilot project stage."\textsuperscript{66} These include a single net pen next to a Gulf of Mexico oil platform and federally supported experiments off the coasts of Hawaii and Massachusetts.\textsuperscript{67} While, at present, there are "no wholly

\begin{itemize}
\item \textsuperscript{59} Firestone & Barber, supra note 5, at 709. This is roughly 2.2 million tons more seafood than the country now produces. Eilperin, supra note 22, at A04.
\item \textsuperscript{60} Craig, supra note 5, at 170.
\item \textsuperscript{61} Id.
\item \textsuperscript{62} Craig, supra note 5, at 170 (quoting NOAA, DEP’T OF COMMERCE, FISHERIES STRATEGIC PLAN (2001)). Craig notes, in support of the fourth objective, NOAA “promised to (1) promote the commercial rearing of at least seven new species [of fish]; (2) reduce the time and cost of permitting environmentally sound aquaculture ventures”; as well as “identify areas in coastal waters and the EEZ suitable for environmentally sound aquaculture development.” Id. at 170-71 n.36.
\item \textsuperscript{63} During the last two decades of the last century, U.S. aquaculture production rose approximately 400\%, to almost $1 billion. U.S. COMMISSION ON OCEAN POLICY FINAL REPORT, supra note 3, at 330.
\item \textsuperscript{64} Id. Firestone and Barber disagree with this estimate and say that, by 1997, marine aquaculture was 40\% of the North American aquaculture production, noting particularly the “explosive” growth in Atlantic salmon mariculture. Firestone & Barber, supra note 5, at 707.
\item \textsuperscript{65} U.S. COMMISSION ON OCEAN POLICY REPORT, supra note 3, at 332.
\item \textsuperscript{66} Id.
\item \textsuperscript{67} Id. at 332, 335; Schatzberg, supra note 5, at 270 (describing these early offshore aquaculture efforts and saying there are experimental offshore fish farms growing scallops, flounder, Pacific threadfin, and red snapper, which have “partial federal research
commercial aquaculture operations” in the EEZ, this is expected to change “dramatically in the next two decades” because of federally supported “intensive” research and development initiatives and financial support from Congress.

C. The Environmental and Socio-Economic Impacts of Near and Off-Shore Fish Farming

The oceans are in crisis, and what’s their response? To allow the enormous expansion of this industry [aquaculture] that’s proven to have a negative environmental impact.

Despite its potentially positive features, non-land based aquaculture is not a benign activity from an environmental perspective. While moving these activities farther offshore may reduce or even eliminate some of these adverse impacts, other adverse impacts will remain the same and new ones may be created. In addition, the growth of either a nearshore or offshore fish farming industry threatens the economic stability of traditional fishers and their communities as much as the declining fish populations do.

1. Adverse environmental impacts of non-land-based aquaculture.

A typical aquaculture facility, whether located in coastal or ocean waters, consists of “cages, net pens, and nursery boxes.” The young fish, which are used to stock these facilities, are generally reared in freshwater hatcheries then moved to net pens anchored on the floor of a coastal bay or the ocean. There, the small fish grow to market size. Although to date, the most likely

sponsored

68. Schatzberg, supra note 5, at 270. However, Schatzberg notes that competition with established foreign coastal fish farms with lower labor costs and less regulatory constraints may inhibit the growth of domestic ocean fish ranching. Id. at 270-71.


70. Gerry Leape, Vice President for Marine Conservation at the National Environmental Trust, quoted in Eilperin, Without Barbs, supra note 34, at A-1.

71. Englebrecht, supra note 4, at 1193.

72. Id. at 1193 n.41.

73. Id.
candidate species for ocean fish ranching in the United States EEZ is salmon, other species, such as summer flounder, Pacific threadfin, sea scallops, and Atlantic cod, are also being considered.\textsuperscript{74}

Among the potential adverse impacts of cultivating fish in pens in open water, regardless of whether these waters are near or offshore, are the spread of diseases, such as sea lice and salmon anemia,\textsuperscript{75} to wild fish stocks; genetic contamination of those stocks, perhaps reducing their ability to survive in the wild; and competition between either native or exotic species and wild fish for food and habitat.\textsuperscript{76} Genetic contamination and competition with native species are of particular concern when farmed species escape from their pens (disease is easily spread even without escape in some cases),\textsuperscript{77} further imperiling wild stock recovery efforts.\textsuperscript{78} The potential of escaped fish to dilute the genetic

74. Schatzberg, supra note 5, at 251 n.8. See also Florence Fabricant, Cod Returns to These Shores, This Time By Boot, N.Y. TIMES, Dec. 14, 2005, at F6 (reporting on importation to the United States of parasite free cod from net pens in waters offshore of the Shetland Islands, raised without antibiotics, pesticides or dyes, and fed by products made from wild herring and mackerel); Paul Greenberg, Green to the Gills: Is There a Way to Farm-Raise Fish that Helps Save the Oceans, N.Y. TIMES MAG., June 18, 2006, at 54 (reporting on efforts in Norway to farm cod).

75. Sea lice eat salmon flesh and salmon anemia kills salmon. See Eilperin, supra note 34, at A-1 (saying in 2002 one Maine fish farm killed over 1.5 million fish in an effort to contain the disease); Englebrecht, supra note 4, at 1196-97 (reporting “disease and parasite outbreaks in aquaculture facilities are becoming commonplace,” and saying both can be spread through exposure to infected fish parts, “blood water from harvesting operations, improper handling and disposal of dead fish, and the movement of personnel and equipment between multiple aquaculture facilities.”)

76. See Firestone & Barber, supra note 5, at 694-95 (listing among the impacts of “seabased fish farming... introduction of exotic species or varieties of fish to new bodies of water, genetic contamination of the wild genome, predation on wild fish, competition with wild fish for food and favorable space, disruptive behavior, stimulation of premature migrations, creation of unacceptably high densities of fish, mixed-stock exploitation problems, predator attraction, and disease and parasite transmission”).

77. Firestone and Barber explain that escape of mariculture fish occurs either through “leakage” (“the escape of a small number of fish during normal operations”) or “through catastrophic events,” like the escape of approximately 100,000 non-North American Atlantic salmon from a net pen off the Maine coast in December 2000. Firestone & Barber, supra note 5, at 710. See also Eilperin, supra note 34, at A-1 (reporting that in 2004 a researcher with the Atlantic Salmon Federation found eight times as many escaped cultivated salmon in a New Brunswick river as wild salmon).

78. See generally Schatzberg, supra note 5, at 255 (saying “[T]he foremost concern for those looking into the negative environmental impacts of salmon farming on the West Coast is the fear of biological pollution in the form of escaping salmon.”) See also Firestone & Barber, supra note 6, at 715 (saying hatchery-reared fish used as feedstock for mariculture operations bred with aggressive feeding behaviors so they grow quickly are particularly problematic for wild stock when they escape because they may “out-compete
material of wild stock is especially high where the wild species is threatened and, therefore, less able to withstand the influence. There is also concern that escaped, non-native fish may successfully spawn in rivers traditionally occupied by wild fish and, if successful, may colonize those waters. The escape of Atlantic salmon from net pens "is apparently routine."

Fish wastes, dead fish, uneaten food, and antibiotics and hormones used to promote growth may contaminate the quality of the water surrounding the net pens. Nutrients and chemical wild fish in certain situations, with no hope of later completing the salmon life cycle because they have not been imprinted with information about where they must return to spawn).

79. Firestone & Barber, supra note 5, at 711.

80. Id. at 712 (discussing the spawning success of Atlantic salmon which have escaped from net pens in the Pacific northwest to spawn in British Columbia, posing a "potential to be an unmitigated disaster... where Pacific salmon are already in severe decline due to overfishing and habitat destruction"); see also Englebrecht, supra note 4 at 1196 (saying in the last ten years almost one million mature Atlantic salmon escaped from Pacific Northwest aquaculture pens, since 1987 Canadian and U.S. fishermen caught approximately 19,000 of these fish in the ocean off the Pacific coast, including 200 in 2001 alone, and in the same period Alaskan fishermen caught almost 600 adult Atlantic salmon, including one in the Bering Sea); Eilperin, supra note 34, at A-4 (reporting industry officials say the number of escaped Atlantic salmon in British Columbia dropped from 89,000 in 1998 to 2,500 in 2004).

81. Firestone & Barber, supra note 5, at 711; id. (saying when the number of escaped fish "are compared to the numbers of wild fish returning to spawn, it is easy to see why a great deal of concern has been focused on the impact of mariculture escapes on wild Atlantic salmon."). See also Englebrecht, supra note 4, at 1194 (saying "fish escapes are inevitable"). Firestone and Barber attribute the "accelerated decline" in wild Atlantic salmon populations in the past thirty years from their historic abundance to salmon mariculture, over-fishing, diversion of water from salmon rivers, toxic pollution, acidification, deforestation, and the introduction of exotic species, like the brown trout, which prey on juvenile salmon. They say "not all" of the salmon populations found today in many of the major river systems in New England "are wild" and can only be maintained through restocking with fry from hatcheries, and that today the total return of both wild and hatchery-reared Atlantic salmon to the waters of the United States is a little over a thousand fish. Firestone & Barber, supra note 5, at 687, 698-702.


83. See Rosamond L. Naylor & Rebecca J. Goldberg, Nature's Subsidies to Shrimp and Salmon Farming, 282 SCIENCE 883 (1998) ("The ocean's capacity to assimilate wastes and maintain viable fish populations is being challenged by aquaculture's continued growth."), quoted in Englebrecht, supra note 4, at 1193; see also U.S. Public Interest Research Group v. Stolt Sea Farm, Inc., 2002 WL 240886 (D. Me. Feb. 19, 2002) (holding aquaculture facilities are point sources under Clean Water Act because they discharge pollutants, including escaped non-native fish); accord U.S. Public Interest Research Group v. Heritage
pollutants from these facilities are discharged directly into the ocean, unfiltered. Fish feces and uneaten food can build up beneath the floating pens and create "bacteria mats" on the ocean floor, posing an additional threat to marine life.

Furthermore, the practice of harvesting wild fish, which are already under traditional fishing pressure, to feed cultivated fish "directly and immediately impact[s] the marine habitat." It "typically" takes "two to five kilograms of wild-caught fish, processed into fish meal and fish oil for feed," to produce one kilogram of farmed marine fish. This pressure on small fish like

Salmon, Inc., 2002 WL 240440 (D. Me. Feb. 19, 2002). The discharge of certain pollutants into net pens is allowed so long as water quality standards are met and no ecological or human health problems are created. This discharge has been permitted "to determine the feasibility of using pollutants to grow aquatic organisms." Tim Eichenberg & Barbara Vestal, Improving the Legal Framework for Marine Aquaculture: The Role of Water Quality Laws and the Public Trust Doctrine, 2 TERR. SEA. J. 339, 393 (1992) (citing 40 CFR §§ 125.10-11). But see generally Firestone & Barber, supra note 6, at 730 (arguing escaped fish should be treated as pollutants and their discharge regulated under the Clean Water Act, and being encouraged by EPA's "cautious step" in 2002 issuing proposed effluent guidelines for aquaculture activities that require operators of "certain net pen systems" to "develop and implement [best management] practices ["BMPs"] to minimize the potential [unintended] escape of non-native species").

84. See Englebrecht, supra note 4, at 1193-94 (saying excess nutrients stimulate phytoplankton growth, depleting oxygen levels in water, stressing or killing fish and other aquatic species, or leading to toxic algae blooms, like red tides and *pfiesteria*, causing large fish kills, contaminating shellfish, and threatening human health); see also Craig, supra note 5, at 199 (saying the number of eutrophic and/or hypoxic areas in ocean waters off of the United States coastline is increasing).

85. Englebrecht, supra note 4, at 1193. See also Firestone & Barber, supra note 6, at 711 (listing among the pollutants discharged from mariculture operations copper to control the growth of marine algae on fish pens, fish food (including biological wastes from the chicken industry, antibiotics, and added pigments to color salmon flesh pink), fish wastes, a variety of diseases, viruses, parasites, and chemicals including antibiotics and biocides).

86. Eilperin, supra note 34, at A-4. See also Englebrecht, supra note 4, at 1194 (saying NMFS "consider[s] that these mats "present the most risk to aquatic habitat").

87. See generally, U.S. COMMISSION ON OCEAN POLICY FINAL REPORT, supra note 3, at 331.

88. Englebrecht, supra note 4, at 1197. See also Craig, supra note 5, at 171-72 (noting the "perverse" impact on wild fish stocks of using wild fish to feed carnivorous marine fish, like salmon, tuna, cod, and sea bass); Schatzberg, supra note 6, at 254 (saying "only if the amount of fish meal and fish oil declines can salmon aquaculture truly contribute to the aggregate global fish supply," and saying also developing countries "can actually lose food resources to aquaculture" because the constituents of fish food "come from small fish caught in the waters off these nations").

89. Craig, supra note 5, at 172. See also Rosamond L. Naylor et al., *Aquaculture – A Gateway for Exotic Species*, 294 SCIENCE 1655, 1656 (2001) ("in 1997 about 1.8 million tons of wild fish for feed were required to produce 644,000 metric tons of Atlantic salmon – a 2.8:1 ratio"), quoted by Englebrecht, supra note 4, at 1197. Craig, supra note 5, at 172 also
anchovies reduces a critically important source of food for wild stock, as well as for marine mammals and seabirds, and disrupts the traditional prey food chain. Also, when wild, instead of hatchery-reared, fish are used to stock these operations, the populations of those species are further depleted.

Marine mammals, such as sea lions, attracted by the farmed fish may become entangled in coastal net pens. The construction of support facilities, like fish processing and canning operations, can destroy wetland and coastal habitats and can themselves be a source of pollutants into the nearshore environment. Additionally, the placement and construction of aquaculture structures like anchors, cages, and net pens, “directly alter” habitat for wild fisheries and, when placed in spawning rivers, can adversely affect the migration and habitat of anadromous fish.

There may also be adverse human health effects associated with the consumption of farmed salmon. A study published in the journal Science last year found sufficiently elevated levels of PCBs, dioxin, and other carcinogens in farmed salmon to warrant a recommendation that consumers limit themselves to one eight ounce portion of farmed salmon per month. These contaminants bioaccumulate and become more potent as one moves up the food chain. There are additional concerns about the amount of antibiotics and hormones fed to farmed fish, such as salmon, and how those may affect human health.

notes it is “non-carnivorous species such as marine mollusks and carps [that] account for most of the current net gain in world fish supplies from aquaculture,” citing ROSAMOND L. NAYLOR ET AL., ENVIRONMENTAL PROTECTION AGENCY, A WATERSHED ACADEMY WEB STEPPING STONE TO LEARNING—EFFECTS OF AQUACULTURE ON WORLD FISH SUPPLIES, http://www.epa.gov/waterrtrain/step8aabstr.html.

90. Craig, supra note 5, at 172. See also Englebrecht, supra note 4, at 1197-98 (quoting Naylor & Goldberg as saying “because of their dependence on wild-caught fish, shrimp and salmon aquaculture deplete rather than augment fisheries resources”).

91. See also Greenberg, supra note 73, at 56 (saying “the overarching concern” of fishers is “the entire reorganization and homogenization of the sea” that may result from aquaculture’s selective breeding of fish for the marketplace).


93. Craig, supra note 5, at 172.

94. Englebrecht, supra note 5, at 1198.

95. Eilperin, supra note 34, at A-4. See also Weber, supra note 43, at 26 (“farmed Atlantic salmon have low levels of omega-3 fatty acids and relatively high levels of omega-6 fatty acids, which can be problematic”).

96. Ronald J. Rychlak & Ellen M. Peel, Swimming Past the Hook: Navigating Legal Obstacles in the Aquaculture Industry, 23 ENVT. L. 837, 863 (1993) (noting that the FDA has approved only two antibiotics and one topical treatment for food fish diseases, and bemoaning the slow pace at which the agency approves new drugs).
2. Specific problems with offshore aquaculture.

Many of the environmental problems associated with coastal fish farming can also occur when the activities are moved farther offshore into the EEZ. In the open ocean, escaped fish can still be disease vectors for wild fish, sea mammals, and sea birds, and can adversely affect wild fish through competition and genetic mutations. Also, even though the ocean is a larger sink in which to disperse pollutants, the dispersed pollutants must go somewhere. Instead of net pens posing a hazard to marine mammals, they now pose a threat to offshore commercial navigation. Even if the pens are submerged below the ocean’s surface to decrease conflicts with surface navigation, the wastes from these facilities may still form a mat on the ocean floor, depending on the depth of the water in which they are located, posing a hazard to bottom dwelling sea life and find their way into the human food chain as wild fish gather around the pens to consume the waste feed. Additionally, both ocean storms, with their extreme wave activity and high winds, and commercial navigation may pose threats to the security of pens that are not submerged.\(^9\) Surface net pens, or those located just below the surface, might experience sufficient damage under certain conditions to allow the escape of fish.\(^9\) There are also logistical problems associated with operating offshore aquaculture facilities – moving workers to and from the net pens, maintaining the net pens during adverse weather conditions – and the need to place them at locations that do not pose barriers to navigation.\(^9\)

3. Impacts on local fishers and fishing communities.

The natural environment is not the only thing that may be at risk from ocean fish ranching. Ocean fishers may suffer as well.\(^1\)\(^0\)

\(^9\) See Schatzberg, \textit{supra} note 5, at 269 n.122 (discussing technological problems associated with locating aquaculture facilities in “the harsher conditions in the open ocean.”)

\(^{98}\) But see Eilperin, \textit{supra} note 34, at A-4 (reporting on the success of the University of New Hampshire’s Open Ocean Aquaculture project, which, in five years, has not had one escaped cod, halibut, or haddock from its three galvanized steel cages six miles off the New Hampshire coast, and where no environmental problems have been “detected”).

\(^{99}\) U.S. COMMISSION ON OCEAN POLICY FINAL REPORT, \textit{supra} note 3, at 332. See also Schatzberg, \textit{supra} note 6, at 269 n.122 (saying “moving [aquaculture facilities] seaward cannot fully eliminate user conflicts . . . with the fishing industry, oil exploration firms, and those navigating the EEZ”).

\(^{100}\) See Eilperin, \textit{supra} note 34, at A-4 (reporting that an Institute for Fisheries Resources’ lawyer who represents “wild-catch fishermen” says his clients “resent
Fishers will lose access to offshore fishing grounds they have traditionally fished for years—in some cases, these areas have been fished for centuries. They may also see the price of their harvests go down as ranched fish flood the market at a lower cost. The effects on individual fishermen may extend to their communities, as reduced yields and depressed prices lead to a general economic decline.

4. Some benefits from moving aquaculture to the open ocean.

While moving fish farming operations offshore may merely transfer the problems of farming in coastal waters farther offshore and create new problems, moving activities out of coastal waters may also provide some benefits. For example, moving aquaculture into the EEZ may avoid some water quality problems that make it difficult to farm fish in coastal waters and eliminate aquaculture as a source of pollution to these waters. Nonpoint source pollution, carrying fertilizers, bacteria, pesticides, chemicals, and other toxic pollutants into coastal waters, acid deposition from power plants, and erosion causing turbidity and sediment loadings in adjacent waters have made the nearshore environment inhospitable for aquaculture. At the same time, as discussed above, fish farming contributes pollution to those same waters through the discharge of fish feces, antibiotics and hormones, pesticides, dead fish, and

aquaculture’s impact on their hunting grounds” and complain that “[i]f you destroy the environment and you destroy the wild fish, there won’t be anything left to fish”).

101. Jose L. Fernandez, Public Trust, Riparian Rights, and Aquaculture: A Storm Brewing in the Ocean State, 20 WM. & MARY ENVTL. L. & POL’Y REV. 293, 294 (1996) (warning against the “potential for the alienation of the bay bottom to private owners, thereby dissipating a public resource on which depend the exercise of historical rights”).

102. See Schatzberg, supra note 5, at 265 (saying Alaskan commercial fishermen “feared the economic impacts of competition with farmed salmon production”); id. (explaining local Alaska fishermen’s opposition to salmon farming in Alaskan state waters came from their fear of large fishing companies “overtaking” their small boat operations); see also Fernandez, supra note 100, at 297 (saying “[t]hose who exercise the right of free fishery argue that aquaculture . . . may drive down the value of the harvest”).


104. See generally, Craig, supra note 5, at 188-200 (describing terrestrial sources of pollution adversely affecting nearshore aquaculture activities and calling for “a better approach to regulating land-based pollution of the oceans, especially nonpoint source water pollution”).
uneaten fish food, which spread disease and parasites and adversely affect important aquatic habitat. According to Naylor and Goldberg,

The increasing scale of these enterprises is now having unforeseen ecological consequences. The conversion of coastal ecosystems to aquaculture ponds destroys nursery areas that support ocean fisheries. Fish farming degrades coastal waters through discharge of nutrients and chemicals, and it disrupts coastal ecosystems by the introduction of exotic species.105

Moving these activities farther offshore106 will protect them from nearshore pollution and at the same time may lessen their direct impact on the coastal environment by dispersing the pollutants in a larger area, assuming that ocean currents do not redeposit the pollutants back into coastal waters.107

In addition, moving these activities away from the coast will also reduce their visibility, perhaps lessening the opposition of coastal residents to them,108 and may make them less disturbing to coastal commercial and recreational fishers.109 Moving aquaculture offshore into the EEZ would also bring the United States "in line with other nations" that are doing exactly that.110

However, as shown above, moving fish farms offshore merely transfers many of their nearshore problems to deep water, and fish farming's onshore socio-economic impacts on local fishers and fishing communities remains the same regardless of where the

106. According to Dowie, the Bush Administration proposes placing these facilities in "the outermost 188 miles" of the 200-mile wide EEZ. Dowie, supra note 81, at 3.
107. But see Wilson, supra note 26, at 500-01 (describing transboundary problems caused by escaped fish that cross national borders carrying diseases and competing with wild fish for food, and saying even though aquaculture's "most acute environmental effects are primarily local . . . changes in local ecosystems can affect the ecosystem as a whole . . . [and] have "broader implications").
108. See Schatzberg, supra note 5, at 268 (saying that local government opposition to expansion of shoreline aquaculture operations in response to pressure from resistant local landowners concerned about aesthetics is fueling NOAA's enthusiasm for ocean fish farming); Greenberg, supra note 73, at 56 (reporting that a combination of environmentalists, fishers, and coastal residents "have kept aquaculture out of most state-controlled waters" because of fear "that it could pollute the coastline and harm wild fish populations").
110. Schatzberg, supra note 5, at 268.
activity takes place. While fish farming may offer substantial
benefits, these do not come without serious associated costs.

In sum, aquaculture serves to enhance the nation's fisheries by
relieving pressure on the wild fish stocks from overfishing.
However, by impairing water quality, introducing exotic species
and diseases, extracting marine biomass, and directly altering
habitat and obstructing migration, aquaculture is increasingly
contributing to marine habitat loss—and consequently presents
an actual and significant threat to the nation's wild fisheries.111

If anything, these costs are potentially greater, not less when
the activity is moved farther offshore because new risks are created
in addition to those that are simply transferred to an open water
environment.

Despite these concerns, many feel that ocean fish ranching will,
and should, develop given the need to meet the demand for fish
and growing opposition to aquaculture in coastal waters. Fueled by
the current downward spiral of wild fish stocks and the potential
profitability of the activity, it seems almost "inevitable" that the
industry will grow.112

D. Current Legal Framework

Despite a kaleidoscope of federal and state laws that might
apply to ocean fish ranching, a serious problem hindering the
industry's development is the lack of a coherent, comprehensive
regulatory regime.113 The present framework for managing
commercial ocean fish ranching is characterized by "complex,
inconsistent, and overlapping policies and regulatory regimes
administered by numerous federal and state agencies."114 This lack
of coherence is a serious barrier to the industry's growth and to its
potential to meet the country's growing demand for seafood.115
The lack of a unified regulatory framework also makes it difficult
to address the potential environmental and economic harms that

111. Englebrecht, supra note 4, at 1198.
112. Firestone & Barber, supra note 5, at 710.
113. See Craig, supra note 5, at 173 (quoting EPA's Office of Water saying "[n]o
comprehensive regulatory framework exists for permitting aquaculture operations").
114. U.S. COMMISSION ON OCEAN POLICY FINAL REPORT, supra note 3, at 332. The
Commission calls this a "conundrum." Id.
115. Id. at 333 (saying the "mix of laws and regulations" means ocean ranching
applicants have "no guarantee of exclusive use of space in offshore areas" and makes
private capital, insurance coverage, and bank loans "difficult to obtain").
aquaculture may produce.116

This lack of a comprehensive regulatory regime is not the result of incomplete jurisdiction over ocean space. International law gives the United States “complete sovereignty over the waters, airspace, seabed, and subsoil” within its twelve-mile territorial sea,117 subject only to the rights of ships to “innocent passage.”118 In addition, the federal government has sovereign authority over the EEZ.119

States also have jurisdiction over a portion of the EEZ and exercise regulatory authority in their waters to protect important state resources. Under the Submerged Lands Act of 1953 ("SLA"),120 coastal states have title to lands beneath and control

116. The 1980 National Aquaculture Act, 16 U.S.C. §§ 2801-2810 (1988 & Supp. III 1991) (Westlaw 2006), did little to change this situation. The law merely stated that it was in the national interest to encourage the development of aquaculture and commissions the preparation of a national aquaculture development plan, id. at § 2801, and directs the Secretaries of Agriculture, Commerce, and Interior to report to Congress on the federal laws and regulations that impede the development of commercial aquaculture activities together with recommendations on how they might be removed, id. at § 2804. Although a National Aquaculture Development Plan was subsequently developed, the federal government has not requested, nor has Congress appropriated, funds for its implementation. Rychlak & Peel, supra note 95, at 841-42.

117. Craig, supra note 5, at 173-74.


119. The UNCLOS III (1982) authorized signatory nations to claim jurisdiction over an EEZ, and although the United States has not ratified the treaty, its legal position is that the treaty's provisions are customary law. Craig, supra note 5, at 173 n.50. In 1983, the United States claimed a 200 mile wide EEZ, and in 1988, President Reagan claimed a twelve-mile territorial sea for the United States, also as authorized by UNCLOS III. Id. In 1999, President Clinton claimed a twenty-four mile wide contiguous zone for the United States. Id. Prior to President Reagan's actions, Congress in the Bartlett Act, Pub. L. No. 89-658, 1-4, 80 Stat. 908, 908 (1966), created a twelve-mile exclusive fishing zone around the United States. Christie, supra note 12, at 112. While displacement of foreign fisheries from EEZs by UNCLOS III “created the possibility for coastal states to address the 'tragedy of the commons' within the EEZ,” many nations saw this as “the opportunity to develop their domestic industries.” Christie, supra note 14, at 11; id. (“freedom of the high seas was replaced by virtually open access for national fishermen”). Christie says since coastal states have extended their jurisdiction over EEZ fisheries, “worldwide marine catch has increased from about 60 million tons” in the mid-1970s to “94.8 tons in 2000.” Id. at 4. See also SPETH, supra note 14, at 107 (saying nation states responded to the creation of exclusive economic zones “by subsidizing new fishing fleets and neglecting needed regulation”).

over coastal waters “at least three miles out to sea, subject to the federal government’s paramount rights”\textsuperscript{121} to regulate those waters and lands for “commerce, navigation, national defense, and international affairs.”\textsuperscript{122} The SLA gives states title to, and the power to “manage, administer, lease, develop, and use,”\textsuperscript{123} natural resources in their territorial seas. Among other marine life, the SLA includes fish, shrimp, oysters, clams, and crabs in the definition of “resources.”\textsuperscript{124} States, therefore, have the power to regulate mariculture activities that take place up to three miles offshore, subject to federal preemption, and the federal government has the power to regulate these activities outside state waters to the outer perimeter of the EEZ.\textsuperscript{125}

Nor is the problem the absence of potentially applicable laws. Indeed, there are many federal and state laws that could apply to ocean fish ranching.\textsuperscript{126} For example, the U.S. Environmental Protection Agency (“EPA”), using its authority under section 402 of the Clean Water Act (“CWA”)\textsuperscript{127} to regulate discharges of

\textsuperscript{121} Craig, supra note 5, at 174 (citation omitted). See also Montserrat Gorina-Ysern, supra note 9, at 665 (stating that through the 18\textsuperscript{th} century, the “limits of fishery rights were those that could be enforced by the cannon-shot, commonly understood to reach out 3 miles from the shore (or 1 maritime league)").

\textsuperscript{122} Douglas v. Seacoast Prods., Inc., 431 U.S. 265, 284 (1977) (quoting United States v. Louisiana, 363 U.S. 1, 10 (1960)) (striking down Virginia law barring federally licensed nonresident fishers from engaging in commercial fishing); Craig, supra note 5, at 174 n.54 (noting that Florida and Texas have historic claims to more ocean territory). See also Englebrecht, supra note 4, at 1234-35 (noting that the Supreme Court called the idea of owning fish prior to their being reduced to possession by “skillful capture” a “legal fiction,” and that there could “be no question today” Congress has “power under the Commerce Clause to regulate the taking of fish in state waters”). On the rule of capture and its evolution from Roman to American law, see generally Blumm & Ritchie, supra note 18 (2005).

\textsuperscript{123} 43 U.S.C. § 1311 (Westlaw 2006).

\textsuperscript{124} 43 U.S.C. § 1301(e) (Westlaw 2006).

\textsuperscript{125} Craig, supra note 5, at 174. See Englebrecht, supra note 4, at 1237-38 (explaining how recent NMFS regulations limit the Agency’s and Regional Councils’ authority to regulate non-Magnuson-Stevens fishing activities and those managed by state agencies).

\textsuperscript{126} This discussion does not include laws like the Food, Drug, and Cosmetic Act (FDCA), 21 U.S.C. §§ 301-399 (Westlaw 2006), which regulates the movement of contaminated and “adulterated” products in interstate commerce, the use of chemicals and antibiotics for use on human food products, and federal fish and shellfish inspection programs or their state replicates. For information on those programs, see Rychlak & Peel, supra note 95, at 861-67.

\textsuperscript{127} 33 U.S.C. § 1342 (Westlaw 2006). Therefore, EPA can require that fish ranchers acquire a national pollution discharge elimination system (NPDES) permit prior to discharging any pollutants from their facilities, and that these discharges conform to regulatory limits once set. See Craig, supra note 5, at 183-84 (stating any aquaculture facility
pollutants into waters over the outer continental shelf ("OCS"), has defined concentrated aquatic animal production facilities ("CAAPFs") as point sources and, in 2004, issued national effluent guidelines for commercial net pens or submerged cage systems producing 100,000 pounds of fish or more. EPA also has authority under section 403 of the CWA to prohibit discharges into the territorial seas, waters of the contiguous zone, and oceans pursuant to a 402 permit unless they are in compliance with EPA’s regulatory guidelines. EPA promulgated “ocean discharge

that is not subject to § 318 is “potentially” subject to § 402 as an aquatic animal production facility). Section 318 of the CWA, 33 U.S.C. § 1328 (Westlaw 2006), creates a limited exemption from section 402 for the discharge of specific pollutants from approved aquaculture projects subject to federal or state NPDES permitting programs that use recycled wastewater from industrial or municipal facilities. Craig, supra note 6, at 182. EPA has issued guidelines under § 318 that exempt non-toxic aquaculture discharges from technology-based effluent limitations. 40 C.F.R. § 125.10(c) (Westlaw 2006).

128. Within the context of the Outer Continental Shelf Lands Act, the “outer continental shelf” includes all submerged lands outside the boundaries of lands which are covered by navigable waters. 43 U.S.C. § 1331 (a) (Westlaw 2006). Section 502 of the Clean Water Act, 33 U.S.C. § 1362(7) (Westlaw 2006), defines “navigable waters” to include the territorial seas and then defines “territorial seas” narrowly to include only those waters where states have primary jurisdiction under the Submerged Lands Act. See 33 U.S.C. § 1362(8) (Westlaw 2006). However, nothing in § 502 restricts the agency’s permitting jurisdiction to the territorial seas, as it also applies to “waters of the United States,” which would include the waters of the EEZ. See 33 U.S.C. § 1362(7) (Westlaw 2006).

129. 40 C.F.R. § 122.24 (Westlaw 2006).

130. 40 C.F.R. § 451 (Westlaw 2006). These guidelines focus on “management practices” to “minimize the release of pollutants,” such as “proper practices for feed management, storage of drugs and pesticides to avoid spilling, disposal of feed bags, nets, and other materials, as well as minimizing the discharge of dead animals or animal parts.” Odin Smith & Ann Powers, Emerging Ocean Issues 5 (Nov. 7, 2005) (unpublished manuscript, on file with author). See also Linda Roeder, EPA Finalizes Regulation on Discharges from Fish Farms, Other Aquaculture Sites, 35 ENV’T. REP. (BNA) 1826-27 (Aug. 27, 2004) (describing the effluent guidelines). In May of 2006, EPA issued a “Compliance Guide for the Concentrated Aquatic Animal Production Point Source Category,” describing the “legally binding statutory provisions and rules” permit writers must apply when they write NPDES permits for wastewater discharges from concentrated aquatic animal production facilities and commercial fish farms. Amena H. Saiyid, EPA Releases Guide for Permit Writers to Ensure Fish Farms Meet Effluent Limits, 37 ENV’T. REP. (BNA) 1119 (May 26, 2006).

131. 40 C.F.R. § 451.1-.24 (Westlaw 2006). The effluent guidelines apply to commercial and noncommercial fish farms, hatcheries, and other aquatic facilities, producing 100,000 pounds or more of aquatic animals in flow-through, recirculating, net pens or submerged cage systems. 40 C.F.R. § 122.24; 40 C.F.R. § 122, app. C; 40 C.F.R. § 451.1-.24. (Westlaw 2006). See Smith & Powers, supra note 129, at 5 n.9. Regulations define net pen systems as “a stationary, suspended or floating system of nets, screens, or cages in open waters of the United States. Net pen systems typically are located along a shore or pier or may be anchored and floating offshore.” 40 C.F.R. § 451.2(j) (Westlaw 2006).

132. 33 U.S.C. 1343(a) (Westlaw 2006).
criteria," under Section 403 in 1980. Amendments to these guidelines have been pending since 2001, but have not been finalized. EPA can also regulate the use of pesticides at these aquaculture facilities under the Federal Insecticide, Fungicide, and Rodenticide Act.

The U.S. Army Corps of Engineers has authority under section 10 of the Rivers & Harbors Act to require ocean fish ranchers to get a permit to locate their facilities in navigable waters. The Outer Continental Shelf Lands Act extended the Corps' permitting authority to include offshore facilities related to energy extraction located in the EEZ. The National Oceanic, Atmospheric Administration ("NOAA") has asserted that offshore aquaculture facilities are subject to the Magnuson-Stevens Fishery Conservation & Management Act when they use any harvesting or support vessels. The U.S. Fish & Wildlife Service and the U.S. National

133. See 40 C.F.R. § 125.120 (Westlaw 2006).
134. Craig, supra note 5, at 178-79 n.85, 200 (stating that EPA was poised to issue new ocean discharge criteria in early 2001 developed under the prior Administration that would have set baseline standards consisting of both a narrative statement of desired water quality and pollutant specific numeric criteria and that would have applied to all permits for discharges into the territorial sea, the contiguous zone, and the EEZ, but that the Bush Administration blocked their publication and have not published new proposed criteria).
138. Schatzberg argues that this permitting authority extends to the EEZ under the OCSLA. See Schatzberg, supra note 5, at 258. See also id. (stating that the OCSLA "does not provide a clear environmental mandate to underlie permitting decisions").
140. See generally U.S. COMMISSION ON OCEAN POLICY REPORT, supra note 3, at 271-72. For a discussion on whether the Magnuson Act confers regulatory authority over ocean fish ranching on the EEZ, see Firestone & Barber, supra note 5, at 734-35 n.241 ("There is some question whether, as a matter of law, the Magnuson Act actually confers on NOAA, NMFS, and the regional Fisher Management Councils the power to regulate aquaculture."); Englebrecht, The Magnuson-Stevens Fishery Conservation Act, supra note 4, at 1188-89 (describing the Magnuson-Stevens Act's application to aquaculture as "minimal and inconsistent," and noting importance of resolving any question about its application to aquaculture activities in the EEZ because the essential fish habitat (EFH) provisions of the SFA make mandatory application of conservation measures to fishing activities in EFHs). Englebracht also says that NMFS "has classified aquaculture as both 'fishing' and 'non-fishing'; . . . [,] has chosen not to adopt any conservation measures for aquaculture ventures that are adversely affecting designated EFH[,]" and has limited the Regional Councils' "authority to regulate 'fishing' activities" affecting EFHs designated within state
Marine Fisheries Service ("NMFS") share authority to regulate offshore ocean ranching activities that might involve species or areas protected under the Endangered Species Act, the Marine Mammal Protection Act, and the Marine Protection, Research, and Sanctuaries Act ("Ocean Dumping Act"). The U.S. Coast Guard can require that navigational lights and signals be attached to ocean ranching facilities and can establish a zone to protect them and any ships in the area. The Food and Drug Administration regulates the addition of additives, like dyes and antibiotics, to food through the Food, Drug, and Cosmetic Act.

To the extent that federal permits apply to ocean fish ranching, the permitting agencies' obligations under the National Environmental Policy Act also apply.

States also have a variety of ways that they can regulate ocean fish ranching activities that occur in their waters. For example, section 401 of the CWA authorizes states to certify that federally permitted activities are in compliance with their water quality standards.

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141. 16 U.S.C. §§ 1531-1544 (Westlaw 2006) (prohibiting the take of listed endangered species and placing an affirmative obligation on federal agencies not to jeopardize their continued existence). If imported exotic species are used in fish ranching, the Lacey Act Amendments of 1981, 16 U.S.C. §§ 3371-3378 (Westlaw 2006), which makes it a crime to import or acquire any fish in violation of any law that might be injurious to humans, or wildlife resources, might apply because of the harm that escaped fish might cause to native species. See Rychlak & Peel, supra note 97, at 857-58 (discussing potential application of Lacey Act to Grass Carp and Tilapia because of their "rapid" reproductive capabilities).


143. Pub. L. No. 95-532, 86 Stat. 1052 (codified in scattered sections of 33 and 16 U.S.C.) (regulating the dumping of any materials into ocean waters and preventing or strictly limiting the dumping of any material that could adversely affect human health or amenities or the marine environment).

144. U.S. COMMISSION ON OCEAN POLICY REPORT, supra note 3, at 101.


146. 42 U.S.C. § 4332 (Westlaw 2006) (mandating the preparation of an environmental impact statement for all federal activities significantly affecting the human environment).

147. See generally Rychlak & Peel, supra note 95 (discussing the application of various state laws to terrestrial or nearshore aquaculture).
standards.¹⁴⁸ This could mean that, even if ocean fish ranching activities occur outside territorial waters, if the waters of the adjacent coastal state are adversely impacted, 401 may be triggered. Section 307 of the Coastal Zone Management Act requires applicants for federal permits to demonstrate the consistency of their authorized activities with state coastal zone management plans.¹⁴⁹ Even though the CZMA “does not explicitly mention aquaculture or mariculture,” some states have relied on the Act’s general policies to initiate “CZMA-related regulatory projects” governing these activities.¹⁵⁰ For example, Mississippi has developed aquaculture net pen guidelines, Rhode Island has developed “a marine aquaculture management plan and geographic information system,” and Virginia has developed and implemented “a marine aquaculture regulatory and leasing program.”¹⁵¹ “Alaska has banned Atlantic salmon aquaculture” in its waters, “Washington has banned the use of certain antibiotics” in aquaculture operations, and “Maryland has placed a moratorium on the introduction of genetically engineered fish into its waterways.”¹⁵² Some states have laws regulating activities in their territorial waters, like Alaska’s rules regulating the transportation of live fish, which might impede ocean fish ranching.¹⁵³

Despite this impressive array of laws that might be applied to ocean ranching in the EEZ, there is no comprehensive regulatory program that does apply,¹⁵⁴ and there are many gaps in the

¹⁴⁸. 33 U.S.C. § 1341 (Westlaw 2006) (requiring federal CWA permit applicants to receive state certification that the proposed discharges do not interfere with the state’s water quality standards and comply with federal law).

¹⁴⁹. 16 U.S.C. § 1456 (Westlaw 2006). States may also issue permits, licenses, and leases for coastal and ocean aquaculture projects within their waters. See also section 318(c) of the CWA, 33 U.S.C. §1328(c) (Westlaw 2006) authorizing states with approved aquaculture programs to issue permits for the discharge of specific pollutants from approved aquaculture projects. Englebrecht, supra note 4, at 1199.

¹⁵⁰. Craig, supra note 5, at 175-76.

¹⁵¹. Id. at 176-77.

¹⁵². Englebrecht, supra note 4, at 1201.

¹⁵³. See generally Rychlak & Peel, supra note 95 (describing state regulations that apply to aquaculture activities).

¹⁵⁴. The Commission on Ocean Policy called for the development of a new marine aquaculture management framework, which among other things should take “into account other traditional, existing, and proposed uses of the nation’s ocean resources.” See U.S. COMMISSION ON OCEAN POLICY REPORT, supra note 3, at 333. In response, the Bush Administration issued a U.S. Ocean Action Plan directing NOAA to develop a program to regulate offshore aquaculture activities, which led to the introduction of the National
potential federal regulatory net. For example, there is no clear regulatory authority over the design of net pens to assure that no farmed fish escape or that no sea mammal entanglements occur, nor is there any clear authority to prohibit the escape of farmed fish or to impose restitution requirements in the event of harm from ocean fish ranching operations. While NMFS has “acknowledged” the existence of these “gaps” and its responsibility “to oversee aquaculture’s impact on the marine environment,” the agency has done little that is meaningful to close them. State laws cannot fill the regulatory gaps because they cannot address migratory species adequately, their extension to the federal waters of the EEZ is vulnerable to a preemption challenge, and states

Offshore Aquaculture Act of 2005, S. 1195, 109th Cong. (2005). The bill provides for the leasing of submerged lands in the EEZ for aquaculture activities and grants the Secretary of Commerce authority to develop a permitting program for those activities. The bill, however, left intact other competing legislative authorities, suggesting only that agencies coordinate among themselves. See Smith & Powers, supra note 129, at 4.

155. Any thought that article 61 of UNCLOS III, requiring coastal states to “adopt measures to prevent overexploitation . . . and maintain and restore stocks to produce ‘maximum sustainable yield,’” Christie, supra note 14, at 5-6, might lead to conservation of fisheries resources within the EEZ has not come to pass, and “problems of overfishing, overcapitalization, single-species management, insufficient scientific data, and excessive bycatch persist within the EEZ,” id. at 17. See also Christie, supra note 12, at 132-33 (discussing concept of maximum sustained yield, its strengths and weaknesses). Christie finds some hope in changes in the international legal regime affecting fisheries, such as adoption of ecosystem principles, protection of biodiversity, principles of sustainability, and ecosystem management. Id. at 135-36. She hopes that coastal states will incorporate these principles into their domestic laws and cites particularly the UN Fish Stocks Agreement as providing incentives for coastal states to adopt and apply them to straddling stocks within the EEZ. Id. Steinberg suggests that “the goal of ‘sustainability’ should not only refer to ecological systems, but also to the “sustainability of economic and social communities.” Phillip E. Steinberg, Fish or Foul: Investigating the Politics of the Marine Stewardship Council, Conference on Marine Environmental Politics in the 21st Century, at 2, available at http://globetrotter.berkeley.edu/macarthur-marine/papers/steinberg-1.html, cited by Gorina-Ysern, supra note 9, at 705. On the history and use of the precautionary principle, see Robert V. Percival, Who’s Afraid of the Precautionary Principle, 23 PACE ENVTL. L. REV. 21 (2005-06).

156. But see generally Firestone & Barber, supra note 5 (arguing that under some circumstances escaped fish can be considered “pollutants” within the meaning of the CWA).

157. Englebrecht, supra note 4, at 1205. Englebrecht reports that NMFS, in 2002, proposed a “voluntary” Code of Conduct for Responsible Aquaculture in the U.S. Exclusive Economic Zone, which he recommends be incorporated into the agency’s enforceable regulations under its Magnuson-Stevens Act authority. Id. at 1205-07. See also Thompson, supra note 8, at 248-49 (explaining how “fishing interests” have fought incorporating more meaningful management and enforcement provisions into the Magnuson Act and how these same interests “have worked to undermine effective implementation of the Act”).

158. Where state law directly conflicts with federal law, under the Supremacy Clause
are more likely to let economic pressure lessen their regulatory zeal in efforts to attract new aquaculture operations.¹⁵⁹

Given the rapid growth of the nearshore aquaculture industry, the push to expand into the waters of the EEZ is understandable. However, it is also very troubling because there is no comprehensive, effective federal regulatory framework for managing ocean fish ranching and no promise of one on the immediate horizon. One alternative to an absence of effective regulation is to allow the marketplace to function.¹⁶⁰ The next section of the article examines the effect of allowing the marketplace to function on fish ranches in the EEZ.

III. PRIVATIZING COMMON POOL RESOURCES TO PROTECT THEM

A. The Ocean as a Common Pool Resource

The sea is common to all because it is so limitless that it cannot become a possession of any one, and because it is adapted for the use of all, whether we consider it from the point of view of navigation or of fisheries.¹⁶¹

The oceans are a giant global commons.¹⁶² They belong to
everyone (*res communis*) and have been considered open to all for navigation, commerce, and recreation since the time of Grotius. The resources in them are available to all for the taking. The fact that the United States has extended its sovereignty 200 miles from its coastline does not transform in any way the open character of these waters or the communal nature of the resources.

Neither the commons nor its resources have been reduced to private ownership. Although fishermen hold many rights such as

(emphasis original).

163. See Gorina-Ysern, *supra* note 9, at 663-64 (saying the debate over whether the ocean and its resources should be considered *res nullius* (“belonging to no one” and thus open to “individual appropriation”) or *res communis* (open . . . [and] belonging to everyone, and incapable of appropriation”) was resolved in UNCLOS III in favor of *res communis*). See also Michael C. Blumm & Lucus Ritchie, *The Pioneer Spirit and the Public Trust: The American Rule of Capture and State Ownership of Wildlife*, 35 ENVTL. L. 673, 677-79 (2005) (explaining various categories of property under Roman law and distinguishing between *res publicae* (things owned by the state), *res communes* (things owned in common, like air, rivers, and the sea), and *res nullius* (things owned by no one and thus" capable of individual appropriation").

164. See Gorina-Ysern, *supra* note 9, at 657-60 (discussing Grotius’ *MARE LIBERUM*); see also McCay, *The Culture of the Commoners*, in *The QUESTION OF THE COMMONS*, *supra* note 1, at 206 (saying Grotius “original learned argument for the freedom of the seas was based on a theory of property that justified the creation of private property only when one person’s activities might endanger another’s”); Macinko, *Public or Private?: U.S. Commercial Fisheries, supra* note 26, at 934 n.73 (saying open access fisheries has “two distinct roots” – the public trust doctrine and Grotius’ writings – but the latter is “irrelevant” to the debates over limited entry because of its “high seas focus and reliance on notions of the inexhaustibility of ocean resources”).

165. Although there are subtle differences between a commons and common pool resources, the terms are used interchangeably in this Article. See Alison Rieser, *supra* note 18, at 400 (distinguishing between a common pool resource, which describes “the nature and condition of the resource,” and common property, which is descriptive of one type of “management regime”).

166. With the exception of leasing space on the outer continental shelf for the extraction of oil, natural gas, and other mineral resources, these waters have not been withdrawn from public access and the United States has never relinquished its sovereignty over the waters or resources of the EEZ. See Rieser, *supra* note 19, at 820 (saying the “public right of fishing” under United States law “tends to maintain [a] condition of non-exclusivity and “to justify maintaining a condition of open access”); McCay, *supra* note 1, at 196-202 (describing how United States fishers rejected “Old World laws of inland fisheries” which were based on “the privileges of private property,” avowing instead “the sentiment . . . of ‘free-taking’”); David A. Dana, *Overcoming the Political Tragedy of the Commons: Lessons Learned from the Reauthorization of the Magnuson Act*, 24 ECOLOGY L.Q 833, 846 (1997) (describing ocean fisheries as “one of the most important remaining commons in the American economy”).

167. See OSTROM, *supra* note 26, at 133-46, 136 (distinguishing between water rights held by water producers, which are "separable from land and well-defined," and the basins that are the source of these rights, which are not owned or "centrally regulated," and are
the right of access to fishing grounds, the right to capture fish and "enjoy the yield" of their efforts, the right to manage the fishery until that right is preempted by the government, the right to exclude others, and the right to give away any of these rights, they do not hold these rights exclusively—i.e. they hold the right to take fish "in common with all other fishermen."168

The fact that oceans are a commons and the resources in them are available for the taking has contributed to the decline in fish stocks.169 The result of this decline may be that what has been the last truly "open frontier" may finally be closing.170

managed by a polycentric set of limited-purpose governmental enterprises").

168. See Rieser, supra note 19, at 819 (describing four "principle regimes" of common property: open access, and government, private, or communal ownership, and saying that of the "sticks" or rights that fishers may get under each of these regimes, the right to manage is the broadest as it includes "the authority" to take engage in activities "affecting the resource's condition"). See also id. at 820 (saying that fishers "do not own any of these rights exclusively," at most, they have a use right, consisting of the right of access and the right to take fish, while the government maintains the right to manage the resource, including the right to exclude and alienate).

169. See Rieser, supra note 18, at 400-01 ("The physical nature of common-pool resources [like fisheries] tends to encourage their overconsumption" because of "the difficulty of excluding other potential users" from the resource as fish stock may be seasonally migratory and located at a significant distance from land, and because once fish are "captured" they are not "available to other fishers, predators, or to the stock itself for reproduction"); id. at 401 (identifying the ocean's biological diversity as a CPR "benefit[ing] the entire biosphere," and saying that when that benefit "is reduced by activities such as overfishing or habitat destruction, the value to all current and future beneficiaries is diminished"). See also Colin W. Clark, Restricted Access to Common Property Fishery Resources: A Game-Theoretic Analysis, in DYNAMIC OPTIMIZATION AND MATHEMATICAL ECON. 117 (E. P.T. Liu ed., 1980) (saying the "tragedy of the commons" has proved particularly difficult to counteract in the case of marine fisheries resources where the establishment of individual property rights is virtually out of the question"), quoted in OSTROM, GOVERNING THE COMMONS, supra note 26, at 13; id. ("common ownership is the fundamental fact affecting almost every regime of fishery management"); H. Scott Gordon, The Economic Theory of a Common-Property Research: The Fishery, 62 J. POL. ECON. 124 (1954) ("The fish in the sea are valueless to the fisherman, because there is no assurance that they will be there for him tomorrow if they are left behind today.") quoted in OSTROM, GOVERNING THE COMMONS, supra note 26, at 3. But see Seth Macinko and Daniel W. Bromley, Property and Fisheries for the Twenty-First Century: Seeking Coherence From Legal and Economic Doctrine, 28 VT. L. REV. 623, 645-51, 645 (2004) critiquing the "standard diagnosis" for the so-called "fishery problem" as being a "property rights problem"); McCay & Acheson, Human Ecology of the Commons, in The QUESTION OF THE COMMONS, supra note 1, at 28-29 (citing sources for the proposition that open access is "only one of a larger set of causes of those tragedies" of the commons).

170. See Susan Hanna, The New Frontier of American Fisheries Government, 20 ECOLOGICAL ECON. 221, 223 (1997) (describing ocean fisheries as an "ocean-resource based frontier") cited by Rieser, supra note 18, at 418. Rieser says "the increasing number of spillover effects between users, including fisheries bycatch levels, habitat destruction, and changes in biological relations among trophic levels (such as predator-prey relations)" are
The institutions of the frontier, including open access, creation of ownership at the point of capture, and reliance on the resource user to make decisions about resource use in competition with others (a scramble competition strategy) are no longer appropriate.171

One response to this closing frontier has been to look toward private property solutions to open access problems, such as individual fish quotas ("IFQs").172

Aquaculture sidesteps entirely the debate over the cause of the collapse of wild fish stocks and whether to stop the downward spiral through marketplace mechanisms like IFQs or governmental

another "signal" that the ocean resource frontier is closing. Rieser, supra note 18, at 418. But see Macinko & Bromley, supra note 168, at 645-46 (seeing commercialization of the oceans as "a "new homestead movement" and the "oceans as the last American frontier freely available for expropriation").

171. Rieser, supra note 18, at 418. Much has been written about what fisheries management regime should replace the existing largely uncontrolled one. See, e.g., Rieser, supra note 19, at 826-29 (proposing a "contractual, co-management" model, in which the government "cedes rights and responsibilities" in a certain fishery for a set period to a "local fishery management agency," like a community association, where the rights would be "renewable semi-permanent rights" and include the right to "define conditions of access, and prescribe management controls" ). But see generally OSTROM, supra note 26 (saying ecological and sociological complexity requires as a response institutional complexity, and rejecting the concept of one size fits all, meaning that common pool resources must either be regulated or privately owned); Thompson, supra note 8, at 243, 246 (exploring why "it has proven difficult for governments, communities, and other institutions to adopt and implement solutions to common dilemmas - and even more troubling, why resource users often have been the most vociferous opponents of solutions," and seeking ways that they could be "enlist[ed] . . . in solving the tragic cycle in which they are trapped").

172. The Magnuson-Stevens Act authorizes IFQs. 16 U.S.C. § 1853(b) (Westlaw 2006). Wyman describes IFQs as a "property rights-based approach for managing resources" because they "share the same purpose," improving economic efficiency, "as other more familiar forms of private property," and because they share "many of the formal characteristics commonly assumed to inhere in private property," i.e. they are "individual allotments that are exclusive, durable, and alienable," "even though there is considerable reluctance to characterize them as such for fear of attracting takings liability" in the event that the government reduces their value. Wyman, supra note 3, at 163-64. See 16 U.S.C. § 1853(d)(2) (A) (Westlaw 2006) (providing IFQs can be revoked or limited without compensation) & § 1853(d)(3) (Westlaw 2006) (declaring IFQs to be permits which can be revoked or limited, and which create no compensable right). See also Am. Pelagic Fishing Co. v. United States, 379 F.3d 1365, 1374 (Fed. Cir. 2004) (holding fishery permittees "did not and could not" possess a property interest); accord Conti v. United States, 291 F.3d 1334, 1341-42 (Fed. Cir. 2002) (finding no property interest in a swordfishing permit because fisher "could not assign, sell, or transfer" it as "it did not confer exclusive fishing privileges, and because the government at all times retained the right to revoke, suspend, or modify it").
regulation of fishing.\textsuperscript{173} Instead, it focuses on replacing those depleted stocks with farmed fish. But, ocean fish ranching, by proposing to enclose portions of the EEZ for the commercial cultivation of fish, is just another type of privatization of a common pool resource.\textsuperscript{174} Although enclosing parts of the ocean is quite different than giving fishers a transferable, exclusive right to take a certain quantity of fish,\textsuperscript{175} each involves the conversion of a common pool resource to individual private property.\textsuperscript{176}

B. Looking Through the Individual Fish Quotas Lens at Enclosing the Oceans

"[M]any of the liveliest contemporary debates concerning property rights are about whether to create private rights in resources traditionally owned by the public through the state, such

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\item \textsuperscript{173} But see Ostrom, supra note 26, at 14 (saying institutional solutions to common pool resource problems are "rarely either private or public – ‘the market’ or ‘the state’"). See also Ralph Townsend & James A. Wilson, An Economic View of the Tragedy of the Commons, in THE QUESTION OF THE COMMONS, supra note 1, at 318, 319 (critiquing IFQs, and saying it is difficult to "create private-property rights" in mobile species, and that "imitating private-property rights without exclusive property rights creates neither the incentives for socially appropriate behavior nor a spontaneous enforcement mechanism").

\item \textsuperscript{174} Efforts to privatize portions of the ocean by enclosing them have not succeeded to date, not for lack of trying. See Wyman, supra note 3, at 126 ("for over six decades" there has been a largely unsuccessful international effort to enclose the oceans: the first “wave” occurred after the end of World War II when "countries began claiming national property rights over ever-larger expanses of the oceans" and their marine resources; the second when individual countries “subdivided national property rights in fisheries domestically into smaller-scale communal regimes;” and for the last thirty years, through the "creation of individual tradable rights"). For an extreme proposal to privatize the oceans see Whitehead, Jr. et al, supra note 34, at 336 (arguing that privatizing the ocean would allow owners to farm fish in their sections, “just as landowners breed and raise cattle on private land”); id. at 341-43 (proposing “electronic fences” to divide open water up between different property owners and to allow for fish “breeders . . . to herd their charges” just like barbed wire allows for herding cattle “in above-ground pastures,” and computer chips on boats to track the amount of time fish spend in various property sections).

\item \textsuperscript{175} Indeed, some see IFQs as “just temporary waypoints on the path to privatization of ‘what really counts,’ the marine ecosystem itself.” Macinko & Bromley, supra note 168, at 624; see also id. at 652, quoting RIGHTS BASED FISHING: PROCEEDINGS OF THE NATO ADVANCED RESEARCH WORKSHOP ON SCIENTIFIC FOUNDATIONS FOR RIGHTS BASED FISHING 3 (Philip A. Neher et al. eds., 1989) (“ITQs are part of one of the great institutional changes of our times: the enclosure and privatization of the common resources of the ocean”).

\item \textsuperscript{176} See Buzbee, Regulatory Commons, supra note 6, at 8 (describing aquaculture as “an industry where harvesters of ocean, river, or lake resources work not in such waters subject to shared use rights, but in confined pens subject to their own maintenance obligations, harvesting rights, and rights to exclude others, . . . in essence, an effort to privatize the classic common pool resources of fisheries").
\end{itemize}
as air, water, fisheries and public lands."\footnote{177} To Macinko and Bromley, "the essential challenge, and the unavoidable imperative in American fisheries policy, seems to be one of getting on with the inevitable conversion of the oceans and their wealth to the logic of thoroughgoing possessive individualism—Lockean private property."\footnote{178} An IFQ is a form of "Lockean private property" to the extent that it gives fishers an exclusive, transferable property interest in a percentage of the allowable catch of a fish species over a given time period (e.g. "limited access fishing licenses or individual harvesting rights").\footnote{179}

The idea behind an IFQ is that fishermen will avoid Hardin's tragedy of the commons because they have been guaranteed their share of the allowable harvest whenever they go fishing and thus will not need to "invest in excessive fishing power or deploy an excess of fishing gear in order to win the 'race to the fish.'"\footnote{180} In the absence of IFQs, Terry Anderson and other free market environmentalists argue that government regulation, usually consisting of limitations on fishing gear, boat size, and the size of the fish catch, "introduce[s] inefficiency into the fishing fleet," perversely prompting the industry to invest in ways to catch more

\footnote{177} Wyman, \textit{supra} note 3, at 125; \textit{see also} Macinko & Bromley, \textit{supra} note 168, at 655-38 (discussing how Justice Field's dissent in \textit{Geer} emphasizing the "law of capture" has influenced contemporary property rights-based rhetoric in fisheries policy).

\footnote{178} Macinko & Bromley, \textit{supra} note 168, at 651-52.

\footnote{179} Rieser, \textit{Contracting for the Commons}, \textit{supra} note 19, at 821; \textit{see also} Wyman, \textit{supra} note 3, at 163 n.118. According to Wyman, only six federal fisheries in U.S. coastal waters have IFQ programs; another five have IFQ-type programs. \textit{Id.} at 167. IFQs are different from "license limitation" where the total number of participants in a given fishery is "fixed," but each fisher's "share of the total allowable catch (TAC) is not fixed . . . [so that] [e]ach licensed participant competes directly against all other licensees for a portion of the TAC"; under an IFQ system, "the total pool of participants is not fixed, but each participant's share of the TAC is fixed by the amount of shares possessed," which amount "is adjusted by buying and selling shares in an open market." Macinko, \textit{supra} note 26, at 923 (likening license limitations to "taxicab medallions" and IFQs to "stock market shares" or "tradable emissions"). Both TACs and IFQs limit entry into the fishery. \textit{Id.}

\footnote{180} Rieser, \textit{supra} note 18, at 407. But Rieser goes on to say that IFQs have not prevented over-fishing because, after foreign fishing vessels were removed from the U.S. EEZ, the domestic fishing industry grew to "unprecedented levels," which "led to . . . overcapacity, reduced profits, short and dangerous fishing seasons, and continuous political pressure on the management system to relax conservation and management measures." \textit{Id.} at 408-09. The 1996 SFA was passed to counteract this trend by reintroducing measures to prevent over-fishing and encourage conservation of fish stocks, as well as to give "attention to non-commercial marine resources and the habitat impacts of fishing gear and activities." \textit{Id.} at 409.
fish.\textsuperscript{181} This effort reduces fish stocks even more and increases overcapitalization of the fleet, which, in turn, dissipates resource rents\textsuperscript{182} from the fishery as they are "wasted in the endless struggle to evade regulation and to catch fish before the fishery is closed."\textsuperscript{188} Indeed, free market environmentalists tout IFQs as a solution to the "relentless and futile cycle in fisheries regulation,"\textsuperscript{184} because only giving fishermen "a private right to harvest an amount of fish which they can use or sell" will enable them to "break out of the cycle" that is the tragedy of the commons.\textsuperscript{185}

While IFQs have many critics, most of the criticisms leveled against them concern implementation,\textsuperscript{186} a subject which is beyond

\begin{itemize}
  \item 181. Rieser, \textit{supra} note 18, at 399.
  \item 182. On the concept of economic rent in the fishing industry, see Marvin, \textit{supra} note 30, at 1145 n.146 (defining economic rent as a fisher's income beyond that required to keep him from abandoning fishing, and stating that "[i]n a perfectly competitive market all fishermen are paid the price necessary to keep the last fisherman fishing," and that "the industry's economic rent" is the income fishers "collectively receive over and above the lowest price they would individually accept").
  \item 183. Rieser, \textit{supra} note 18, at 399; Marvin, \textit{supra} note 30, at 1145-48 (discussing these phenomena). \textit{But see} Rose, \textit{supra} note, 161 at 70 (describing the use of common property regimes by holders of IFQs to conserve fishing habitat); \textit{cf}. Erin Webreck, \textit{The Challenge of Battling Privatization: A Case Study of Swedish Water Companies}, 5 SUSTAINABLE DEV. L. & POL'Y, Winter.2005, at 30. (listing arguments in favor of privatizing water systems such as that private interests possess sufficient financial resources to maintain natural resources and have the technical expertise and "aptitude" to manage resources efficiently).
  \item 184. Rieser, \textit{supra} note 18, at 398-99, \textit{citing} TERRY L. ANDERSON \& DONALD R. LEAL, \textit{FREE MARKET ENVIRONMENTALISM} 121-34 (1991); \textit{see also} Rieser, \textit{supra} note 19, at 823 (stating that IFQs can "reduce costs by eliminating the race to fish and by allowing the market to allocate fishing rights to lower cost fishermen and fishing methods," freeing up "money to invest in resource improvement," and "reducing overcrowding [of fishing grounds], the race to harvest in an increasingly shorter season, landing gluts, and poor quality").
  \item 185. Rieser, \textit{supra} note 18, at 399. However, the holder of an IFQ does not have a property right in the fish she is entitled to take, as the government can revoke or curtail an IFQ at any time without compensation, and it does not create a right in, or title to, fish before they are harvested. Rieser, \textit{supra} note 19, at 821, \textit{citing} Sustainable Fisheries Act, Pub. L. 104-297, § 108(e), 110 Stat. 3559, 3576-77 (1996) (codified at 16 § U.S.C. 1853(d) (Westlaw 2006)). Macinko & Bromley, \textit{supra} note 168, at 625 (saying that they "know of no explanation of IFQs that does not invoke a property rights-based explanation of how IFQs work"). Indeed, the limited nature of this right, reflected in the fact that the government can "expropriate the resource or fail to renew the use rights," prompts Rieser and others to criticize IFQs on the ground that the holder of those rights will not have "sufficient certainty or incentive to invest in the long-term value of the resource." Rieser, \textit{supra} note 19, at 822 \textit{(explaining how the language of the Magnuson-Stevens Act "disavowing any duty to compensate IFQ holders . . . works against the creation of stewardship incentives" and regulations implementing the Act that restrict the transfer of IFQs to protect "the social structure of existing fishing communities" decreases the incentives of IFQ holders "to consider how others value the right, including future generations").}
  \item 186. \textit{See generally} Rieser, \textit{supra} note 19, at 822-23 (complaining that the enforcement
the scope of this article. However, some criticisms focus on the idea of privatizing portions of the oceans. 187 This article focuses on those concerns because they are also germane to the privatization involved in ocean fish ranching.

Critics protest that individual property approaches like IFQs ignore communal rights in common pool resources and communal norms, which have a socializing influence. 188 They contend that IFQs often create social and economic inequities because of the greater political and economic clout of the fishing industry to influence the distribution of licenses. 189 This favoring of large fishing firms over smaller, less economically powerful fishers, which might also be expected to occur in the case of large ocean fish ranching enterprises, rewards efficiency over equity. 199

costs of IFQs are high because they reward cheating, and that IFQs are distributed to too many holders because they are instituted late in the management process in mature fisheries, are set too high, encourage rent-seeking, and are too inflexible to allow the adoption of alternative management strategies; Rieser, supra note 18, at 405-06 (saying that IFQs ignore community stakeholders who “are more likely to embody a broader range of values and . . . therefore balance harvesting decisions against broader spatial and temporal views of the ecosystem” and who are able to “enforce limits on individual appropriators through informal norms and sanctions”; Wyman, supra note 3, at 160 n.110 (saying IFQs encourage fishers to “highgrade” (to catch more economically valuable fish) or not report their actual catches, “are inconsistent with ecosystem-based management . . . [because] they are premised on single species management,” and may “give rise to expectations among fishers” that they are a form of property right); Rose, supra note 7, at 22 (indicating property rights systems are expensive to monitor and enforce).

187. See, e.g. McCay, supra note 1, at 208-09 (describing resistance of local oystermen to enclosing the commons through creation of private or leased oyster beds and “persistence of the sentiment or culture of the commons”); Rieser, supra note 19, at 814 (asserting that if there are to be “property regime[s]” as part of management strategies to conserve fish stocks, then those regimes must “reflect both the public property rights in the ecological condition of the marine environment and the private or common ownership rights of access, harvesting and management”).

188. See Robert W. Gordon, Paradoxical Property, in EARLY MODERN CONCEPTIONS OF PROPERTY 95, 108 (John Brewer & Susan Staves eds., 1995) (saying that property ownership has suppressed “the collective and collaborative elements” of society arising from “the necessity of mutual dependence”); Rieser, supra note 18, at 419 (saying that any new property rights “must be created in a manner informed by a wider sense of social justice” and must establish “a link . . . between rights and responsibilities”).

189. Neal D. Black, Note, Balancing the Advantages of Individual Transferable Quotas Against Their Redistributive Effects: The Case of Alliance Against IFQs v. Brown, 9 GEO. INT'L ENVTL. L. REV. 727, 728 (1997) (saying that IFQs “tend to favor larger, more efficient fishing operations”).

190. See Wyman, supra note 3, at 160 (saying ITQs, by “privileging aggregate efficiency over equity,” will cause small fishers to lose access to rents and consolidate harvesting in a few large, more efficient firms); DeLuca, supra note 14, at 757 (noting that the “bias [in this country] towards capital over labor . . . [is] reflected in the IFQ programs” and conflicts with “other values, such as prior effort, community development
Through time this process ensures that quota becomes concentrated in the possession of fewer and fewer vessel owners. It also assures that through time fewer coast communities contain vessels with quota supplying resource to local plants. In short, quota and fishing activity become increasingly concentrated in fewer and fewer enterprises and fishing towns.[191]

Additionally, some critics assert that individual property rights like IFQs are fundamentally at odds with the nature of ecosystems, which are complex, dynamic, self-organizing systems.[192] Alison Rieser says that human intrusion into those complex systems through various management prescriptions must, “over the long term,” “sustain the integrity of an entire ecosystem,” of which fish stocks are only one element.[193] Marine ecosystems “have valuable components beyond the fish caught, marketed, and consumed,” such as biodiversity and habitats.[194] Granting individual property
rights in fish or their ocean habitat runs “a serious risk that all other valuable components of the ecosystem, which have no direct market value and whose contribution to the ecosystem’s productivity is not understood, will be ignored.” To Rieser, “property rights accorded any one individual cannot adequately take account of the entire ecosystem,” and the concept of an individual property right should be seen as being “more consistent with the previous era of resource use, a time when the policy goal was to design incentives to capture the flow of benefits from fish populations without an excess investment in physical capital.”

Professor Carol Rose fears that a property-based measure will “elevate the significance of the propertized component and, in effect, over-value them,” which will encourage the property rights holder to disregard the “entitlements of others interested in the same resource or ecosystem.” This, in turn, might lead the stronger entitlement holders to over-reach and “overstate what they ‘own’”, blocking management initiatives designed to protect “other components of the same ecosystem.” Further, giving ocean fish ranchers an exclusive right to use the ocean for the cultivation of fish creates a quasi-property right in those fish and their habitat which “by definition, excludes some individuals from participation.” The underdog in these situations may well be

value of a rich and diverse marine ecosystem.” Id. at 405. See also Paul Greenberg, The Catch, N.Y. TIMES, Oct. 23, 2005, §6, at 60 (describing the plight of the Chilean sea bass as illustrating why “the world is running out of fish” and describing the “cascading decline of fish species”).


196. Rieser, supra note 18, at 418-19.


198. Rieser, supra note 18, at 405, citing Rose, supra note 196, at 173. Rieser’s solution to this problem is that any property rights in fish, like IFQs, should “emphasize less the individual nature of the property right and more the community nature of the right.” Id. This can be done for fisheries by giving communities ITQs. Rieser, supra note 18, at 405. Rieser warns that any system of co-management must include “the right to exclude others from . . . the fishery.” Rieser, supra note 19 at 826; see also Britton, supra note 190, at 255 (arguing for “community-based fishery management systems,” which “seek to harness the forces of custom and culture to constrain the tragedy of the commons by allowing fishermen to participate in the government regulation of fisheries”).

199. Gorina-Ysern, supra note 9, at 704, quoting Phillip E. Steinberg, Fish or Foul: Investigating the Politics of the Marine Stewardship Council, CONFERENCE ON MARINE ENVTL. POL. IN THE 21ST CENTURY, (1999),
fishing communities.\textsuperscript{200} Rieser worries that individual property rights cannot respond to the "cascading effects" on the entire marine environment caused by the collapse of fish stocks.\textsuperscript{201} Quoting Professor Lee Breckenridge, she notes that individual property rights are based on a view of nature "as something that can be 'separated into components and dedicated to [the] production of particular commodities'"—in the case of ocean fish ranching operations, these components are the discrete parts of the ocean ecosystem. However, this view ignores all the other "legitimate claims of other components of marine ecosystems."\textsuperscript{202}

When the marine environment is viewed "ecologically," Rieser says, it is "at work, performing important services in its unaltered state . . . . Transformation diminishes the functioning of this economy and, in fact, is at odds with it."\textsuperscript{203} This suggests that use

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\textsuperscript{200} http://globetrotter.berkeley.edu/macarthur/marine/papers/steinberg-6.html. Although Steinberg's comment is directed toward the Marine Stewardship Council's certification program that would privately "certify" local fishing fleets that adhere to a "fisheries code of conduct" and fish processors and distributors who buy from them, the idea that property can be created in fish through a market mechanism that results in the exclusion of some fishers from taking part in a "club" of exclusive participants, is analogous to giving ocean ranchers an exclusive right to take what in essence is a "club good." For a fuller description of how this Council would work, see id. at 704, n. 233.

\textsuperscript{201} Cf. Webreck, supra note 182, at 30 (saying that privatizing water supplies may leave poorer areas "suffering because long-term investment in resources" may become "infeasible and unprofitable" and cause a price increase in "essential resources," which can lead to "increased social conflict," invite corruption, and be "fundamentally unfair and unjust" to the extent that the "poorest members of society" must pay for essential resources instead of having them provided based on need). The SFA contains provisions "requiring consideration of the importance of fishing to certain 'fishing communities' and greater attention to the distribution of economic benefits from U.S. fisheries." Rieser, supra note 18, at 409, citing 16 U.S.C. § 1851(a)(8) (Westlaw 2006); see also Christie, Living Marine Resources Management, supra note 12, at 159 (saying that the 1990 Magnuson-Stevens Act amendments require regional fisheries management plans include a "fishery impact statement" to "assess, specify, and describe" the plan's effects on fishing communities and that National Standard 8, added to the law in 1996, directs regional managers to consider the importance of fish to fishing communities and "to the extent practicable" minimize adverse economic impacts on those communities and sustain their participation in the fishery), quoting 16 U.S.C. §§ 1851(a)(8), 1853(a)(9) (Westlaw 2006).

\textsuperscript{202} Rieser, supra note 18, at 419.

\textsuperscript{203} Rieser, supra note 18, at 419.

rights should arise principally from nature-based considerations. "The marine environment is, like land, part of a community which extends beyond the dominion of the owner, where use rights must be determined by physical nature, not humankind, and where public and exclusive owners have a custodial and affirmative protective role for ecological functions." As IFQs are a "highly individualistic mode of production," what Anthony Scott terms the "hunting-and-gathering stage of economic production," Rieser also worries that IFQs will discourage participants from collecting and sharing information; conserving, protecting, and enhancing fish stocks; and achieving economies of scale. This happens because fishing under an IFQ system "still leave[s] each fishery in the hunting and gathering stage of economic production . . . a highly individualistic mode of production" that creates disincentives for "collectively advancing the 'new concern for the future value of their property' that they share." In any new technology, such as ocean fish ranching, the collection and sharing of information, especially about problems with that technology, is critical.

Privatizing portions of the ocean through a property-based mechanism such as the IFQ will commodify a common pool resource and give ocean fish ranchers the most important stick in the bundle of property rights the ability to exclude the public from what otherwise would be publicly available resources. This

205. Rieser, supra note 18, at 420; see also Breckinridge, supra note 194, at 303 ("[H]uman institutions must become newly flexible, adaptive, and open to environmental signals. . . . [T]he main goal must be to foster resilience in ecosystems and avoid human-induced alterations beyond the range of perturbations that ecosystems have evolved to absorb.").

206. Rieser, supra note 19 at 824, quoting Anthony D. Scott, The ITQ as a Property Right: Where It Came From, How It Works, and Where It is Going, in TAKING OWNERSHIP: PROPERTY RIGHTS AND FISHERY MANAGEMENT ON THE ATLANTIC COAST 31, 79-80 (Brian Lee Crowley ed., 1996). But see Rieser, supra note 19, at 826 (saying that public choice scholarship shows that a top down regulatory approach "is vulnerable to the pressures of special interest groups . . . and to the self-interest of governmental officials and politicians," and that "when government agencies regulate fisheries, fishermen often selectively provide managers with information about the resource and the technology they use").

207. Rieser, supra note 19, at 824.

208. See Rieser, supra note 19, at 819 (saying that "[p]roperty law has given us the metaphor of property as a bundle of rights composed of several 'sticks,' each stick consisting of a distinct right or power that ownership conveys," and "applied the . . . metaphor to fishing"); see also id. at 827 (saying in fisheries the right to exclude is "essential").

209. Macinko views Arnold v. Mundy as "a pronouncement on the duty of the state, as the representative of the people, to maintain common use rights as an instrument of
conversion contradicts the proposition that common pool natural resources should be open to all and not subject to individual appropriation.

[T]he purported inefficiencies of shellfishing and other activities done within a common-property regime must be assessed against the fact that “it was with a particular social welfare function in mind that our founders determined that certain natural resources would remain the common property of all—not the private property of the fortunate few.”

Critics of IFQs have shown how converting common pool resources into individual property can create distributional inequities, undermine communal norms, and contradict the natural workings of ecosystems. Moreover, they have detailed how private property regimes can impede the sharing of information and implementation of broader management strategies. They have also shown how conversion to a private property-based regime can lead to resource management problems without necessarily promoting conservation of resources or economic advancement of local fishing communities.

If IFQs are an imperfect answer to declining fish populations, then should not ocean fish ranching, with its potential to offset those losses, be welcomed and even encouraged? Yet this article
has shown that there are serious concerns with allowing ocean fish ranching to proceed unregulated, some of which may flow from the replacement of a common property management regime with a private property one.

The article turns next to an exploration of the public trust doctrine as a possible regulatory gap filler, a means of preventing these harms until a comprehensive, protective regulatory program can be implemented. However, before the public trust doctrine can be so employed, a basis for its application must be found.

IV. APPLICATION OF THE PUBLIC TRUST DOCTRINE TO THE EEZ

[N]othing is clearer settled in the law than that all men have the right to catch fish in the bays, inlets, and arms of the sea, and that no man has the right to catch fish to the injury of others in their rights.212

The public trust doctrine is a venerable common law property doctrine rooted in Roman law213 and long recognized in the United States. The doctrine is based on the proposition that the sovereign holds certain common properties in trust in perpetuity for the free and unimpeded use of the general public. Public access to public trust resources is at the core of the doctrine.214


214. See Meyers, supra note. 213, at 731 (“In essence, the courts protect access rights to public trust resources.”). Cf. Kootenai Envtl. Alliance, Inc. v. Panhandle Yacht Club, 671 P.2d 1085 (Idaho 1983) (allowing the construction of exclusive yacht club on a lake, but only after finding the club would not interfere with navigation if properly lighted and marked and did not substantially impair public rights in the remaining waters and that the grant remained subject to the public trust).
Consequently, "absolute private dominion over property impressed with the public trust can never be granted unless it is in the public interest to do so,"215 since it interferes with public access to those resources.

Professor Joseph Sax rediscovered the public trust doctrine in a 1970 article,216 in which he suggested it be used to address a variety of environmental harms. Since then, others have deployed the doctrine to protect natural resources from commercial development and to assure public access to those resources "for the exercise of historically recognized rights,"217 like fishing, oystering, and navigation.218 Although expanded over time to

215. Ill. Cent. R.R. Co. v. Illinois, 146 U.S. 387, 433 (1892); see also United States v. 1.58 Acres of Land, 529 F. Supp. 120, 122-23 (D. Mass. 1981) ("Historically, no developed western civilization has recognized absolute rights of private ownership in [submerged] land as a means of allocating this scarce and precious resource among the competing public demands. Though private ownership was permitted in the Dark Ages, neither Roman law nor the English common law as it developed after the signing of the Magna Charta would permit it.").


217. Fernandez, Public Trust, Riparian Rights, and Aquaculture, supra note 216, at 302 n. 49; see also Harry R. Bader, Antaeus and the Public Trust Doctrine: A New Approach to Substantive Environmental Protection in the Common Law, 19 B.C. ENVTL. AFF. L. REV. 749, 761 (1992) ("The marriage of absolute ecological protection with absolute access for the purpose of utilizing natural resources comes the closest to the true essence of the public trust doctrine."); Meyers, Protection of Wildlife, supra note 212, at 735 ("[T]he public’s interest in common natural resources . . . includes both access to those resources for economic and nonconsumptive uses as well as restrictions on use or access to promote common needs and amenities."); Macinko, Public or Private?: U.S. Commercial Fisheries, supra note 26, at 954 ("A striking feature of the idea of the classic [public] trust doctrine, the role of common use rights in mediating class relations through distributional equity, is that it underlies responses to great class challenges of different epochs."); id. at 920 (faulting the “abandon[ment]” of the doctrine’s original emphasis on “distributional equity and common rights based upon democratic ideals” in “our contemporary quest for environmental preservation” and of its original “specificity . . . in exchange for the extreme malleability of current articulations”).

218. See generally, Hope M. Babcock, Has the United States Supreme Court Finally Drained the Swamp of Takings Jurisprudence? The Impact of Lucas v. South Carolina Coastal Council on Wetlands and Coastal Barrier Beaches, 19 HARV. ENVTL. L. REV. 1, 36-54 (1995) (discussing the doctrine’s evolution in this country); Hope M. Babcock, Should Lucas v. South Carolina Coastal Council Protect Where the Wild Things Are? Of Beavers, Bob-o-Links, and Other Things that Go Bump in the Night, 85 IOWA L. REV. 849, 889-98 (summarizing salient aspects of the public trust doctrine and its application to many species of wildlife, including fish); Ill. Cent. R.R. Co. v. Illinois, 146 U.S. 387, 452 (1892) (saying state title to lands under navigable waters are “held in trust for the people of the State that they may enjoy the navigation of the waters, carry commerce over them, and have liberty of fishing therein
protect an array of land-based resources and a variety of uses, including recreation, the doctrine’s origins were water-based, and it was traditionally applied to protect public rights in fishing, oystering, and navigation.\textsuperscript{219}

The ocean has the attributes of a classic public trust resource—\textit{res communis},\textsuperscript{220} “open to everyone, belonging to everyone, and incapable of appropriation by anyone.”\textsuperscript{221} Indeed, “[t]he sea is common to all because it is so limitless that it cannot become a possession of any one, and because it is adapted for the use of all, whether we consider it from the point of view of navigation or of fisheries.”\textsuperscript{222}

The public trust doctrine protects public rights in trust resources and prevents the government or private individuals from alienating or otherwise adversely affecting those rights.\textsuperscript{223} This

\begin{itemize}
\item \textsuperscript{219} See Babcock, \textit{Protecting Where the Wild Things Are}, supra note 217, at 891 n.180 and accompanying text; see also Emily A. Gardner, \textit{A Victim of Its Own Success: Can User Fees Be Used to Save Hanauma Bay}, 4 OCEAN & COASTAL L.J. 81, 98-99 (1999) (“While the public’s rights to use navigable waters were historically limited to uses associated with navigation, commerce and fishing, since the United States’ adoption of the public trust doctrine, a number of state courts have expanded the list of protected rights in navigable waters to include recreational uses.”); Wood, \textit{Protecting the Wildlife Trust}, infra note 222, at 611 (explaining the expansion of the doctrine’s geographic coverage and scope of protected trust-based activities).
\item \textsuperscript{220} Gorina-Ysern also argues as a basis for establishing a “world ocean public trust” to protect ocean resources that the sea can be seen as \textit{res publicae}, in which “the people of the whole world (as a unity) have a collective property right.” Gorina-Ysern, \textit{World Ocean Public Trust}, supra note 9, at 665-66.
\item \textsuperscript{221} Id. at 664; see also id. at 666 n.76 (explaining that “[u]nder common law, the \textit{jus piscandi} in the sea and in rivers belonged to all with very few exceptions,” such as “fishing in private rivers, . . . where it was customary not to fish for private gain but for the public good, and where immemorial custom prohibited fishing”).
\item \textsuperscript{222} HUGO GROTIUS, \textit{MARE LIBERUM} 28 n.3 (1608), quoted by Gorina-Ysern, \textit{World Ocean Public Trust}, supra note 9, at 661.
\item \textsuperscript{223} Babcock, \textit{Protecting Where the Wild things Are}, supra note 217, at 891; see also Mary Christina Wood, \textit{Protecting the Wildlife Trust: A Reinterpretation of Section 7 of the Endangered Species Act}, 34 ENVTL. L. 605, 612 (2004) (“[G]overnment trustees are required to preserve wildlife assets and protect them against damage.”); Arnold v. Mundy, 6 N.J.L. 1, 76-77 (1821) (saying the public trust doctrine protects public use rights in navigable waters, tidal rivers, and the seacoast, “including both the water and the land under the water,” for purposes of “passing and repassing, navigation, fishing, fowling, sustenance, and all the other uses of the water and its products”); Vander Bloemen v. Wisconsin Dep’t of Natural Res., No. 95-1761, 1996 WL 346266 (Wis. App. June 26, 1996) (unpublished decision)
\end{itemize}
capacity to "constrain the natural tendency of governmental officials to exhaust resources in the present generation" acts like "a normative anchor . . . geared towards sustaining society for generations to come." Indeed, some courts have gone so far as to hold that the doctrine imposes an **affirmative** obligation on states to preserve trust resources for the benefit of the public. 

Uses of trust resources that are inconsistent with the doctrine are revocable, and the government never loses its power to revoke those uses. Thus, the government has the equivalent of a perpetual "easement" over trust resources that "permanently burdens their ownership in favor of the general public."

The State can no more abdicate its trust over property in which

(holding state properly exercised its fiduciary duties to protect lakeside ecosystem by maintaining high water levels which it had created by raising lake's water level); Aspen Wilderness Workshop v. Colorado Water Conservation Bd., 901 P.2d 1251, 1257 (Colo. 1995) (en banc) (holding state could not allow appropriation of water needed to preserve natural environment for ski resort's snowmaking purposes). Some scholars have recommended the expansion of the doctrine to protect entire ecosystems. See Eric T. Freyfogle, *Ownership and Ecology, 43 CASE W. RES. L. REV. 1269, 1289-90 (1993)* (arguing for expanding the settings in which the legal concept of public trust could be applied); Alison Rieser, *Ecological Preservation as a Public Property Right: An Emerging Doctrine in Search of a Theory, 15 HARV. ENVTL. L. REV. 393 (1991)* (explaining various theoretical bases for expansion of the doctrine to protect naturally functioning ecosystems).  

224. Wood, *Protecting the Wildlife Trust*, supra note 222, at 612; *see also* Commonwealth v. Alger, 61 Mass. (7 Cush.) 53, 83 (1851) ("[W]hether this power be traced to the right of property or right of sovereignty as its principle source, it must be regarded as held in trust for the best interest of the public . . . ."); Wilkinson, *The Public Trust Doctrine, infra* note 283, at 313 (suggesting courts should construe federal laws "to effectuate Congress' intent to act as a trustee charged with the duty of protecting and preserving the public resources" and to limit agency discretion).  


227. *Id.* at 893 ("One cannot construct a common law canon more offensive to the notion of absolute private rights in property than the public trust doctrine.").
the whole people are interested, like navigable waters and the soils under them, so as to leave them entirely under the use and control of private parties . . . than it can abdicate its police powers in the administration of government and the preservation of the peace.  

This is not to say the public trust resources can never be alienated. They can be conveyed to private hands if the alienation will serve the public interest without harming trust uses in the remaining land. In fact, there can be private title in trust resources as long as the private use of trust resources is consistent with the trust's purposes, does not interfere with uses protected by that doctrine, and will preserve those purposes for both present and future generations.

However, when courts are confronted with the conveyance of trust resources for some private purpose, they react in different ways. Some courts require only that the government agency consider potential adverse impacts to the public trust in its review of a proposed activity and allow the action to proceed if the impacts on the remaining trust resources are minor. Other courts apply a balancing approach when conflicts arise over the

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228. Ill. Cent. R.R., 146 U.S. 387, 453 (1892). See also id. at 452-53 (the public trust doctrine does not "sanction the abdication of the general control of the State over lands under the navigable waters of an entire harbor or bay, or of a sea or lake").

229. Id. at 453 ("The control of the State for the purposes of the trust can never be lost, except as to such parcels as are used in promoting the interest of the public therein, or can be disposed of without any substantial impairment of the public interest in the lands and waters remaining."); see also Nat'l Audubon Soc'y v. Superior Court of Alpine County (Mono Lake Case), 658 P.2d 709, 724 (Cal. 1983) ("The public trust is more than an affirmation of state power to use public property for public purposes. It is an affirmation of the duty of the state to protect the people's common heritage[,] . .. surrendering that right . . . only in rare cases when the abandonment of that right is consistent with the purpose of the trust.") The public purpose that will be served by a conveyance of trust lands cannot be "incidental, remote or secondary." Eichenberg & Vestal, Improving the Legal Framework for Aquaculture, supra note 82, at 349.

230. Ill. Cent. R.R., 146 U.S. at 453; see also Britton, Privatization of the American Fishery, supra note 190, at 249 (saying the doctrine could provide "a framework for recognizing private property interests in fisheries resources, which could be recognized in the form of a long-term lease interest in catch quotas," which could, in turn, "be allocated to community or regional groups in a cooperative management system").

231. Musiker et al., supra note 224, at 98 (saying some courts allow action in derogation of the public trust "to proceed only if the impacts are minimal or necessary"); see also Ill. Cent. R.R., 146 U.S. at 433, 453, 455 (imposing on states the duty to prevent "substantial impairment" of trust resources); Nat'l Audubon Soc'y, 658 P.2d 709, 728-29 (1983) (saying the state can authorize the diversion of water to meet public needs, but cannot do so "without consideration of the public trust" and must maintain "continuing supervision of the taking" to be sure the public trust is not unnecessarily harmed).
use of trust resources;\textsuperscript{232} while still others allow alienation of trust resources upon legislative authorization.\textsuperscript{233} Although courts vary in the standards they use to evaluate the permissibility of transferring trust resources to private holdings, all courts scrutinize the transfer to see if the trust lands’ “utility for public trust purposes” will be diminished by private use.\textsuperscript{234} Courts “look with considerable skepticism upon any governmental conduct which is calculated \textit{either} to reallocate [a public] resource to more restricted uses \textit{or} to subject public uses to the self-interest of private parties.”\textsuperscript{235}

\textsuperscript{232} See, e.g., Nat'l Audubon Soc'y, 658 P.2d at 728 (“This is not a case in which the Legislature, the Water Board, or any judicial body has determined that the needs of Los Angeles outweigh the needs of the Mono Basin, that the benefit gained is worth the price. Neither has any responsible body determined whether some lesser taking would better balance the diverse interests.”).

See also Musiker et al., supra note 224, at 98 and supporting citations (saying some courts “have advocated more of a balancing approach”); Babcock, \textit{Wetlands and Coastal Barrier Beaches}, supra note 217, at 46, n. 261 (discussing balancing under the public trust doctrine); Bader, \textit{Public Trust Doctrine}, supra note 216, at 762 (criticizing the Mono Lake court’s use of the public trust doctrine as being “essentially procedural, with a weak substantive component,” “procedurally” requiring courts to do no more than direct environmental decisionmakers to “embark upon a policy balancing analysis, and substantively . . . [only] attempt to minimize environmental harms”). Bader argues that his more muscular interpretation of the doctrine would require a court “to ask if the proposed water diversions [from Mono Lake] posed a substantial threat to the diversity and stability of the ecosystem for which the lake is a focal point,” which would lead the court into a variety of scientific inquiries, which, depending on their outcome, could “obligate[d]” the court “to issue either an injunction or specific compliance orders eliminating the threat posed by Los Angeles’s water demands.” Id. \textit{But see} Meyers, \textit{Protection of Wildlife}, supra note 212, at 732 (interpreting \textit{Mono Lake as protecting the lake’s “biological and ecosystem integrity . . . by requiring the state to reconsider its allocation of water from the lake to Los Angeles County”).

\textsuperscript{233} Eichenberg & Vestal, \textit{Improving the Legal Framework for Aquaculture}, supra note 82, at 349 (saying “trust lands may only be conveyed for purposes approved by the legislature as public uses.”). \textit{See also} Gould v. Greylock Reservation Comm'n, 215 N.E.2d 114, 123-24 (1966) (finding law authorizing commercial lease of state reserved land too vague to authorize construction of ski area); Babcock, \textit{Wetlands and Coastal Barrier Beaches}, supra note 217, at 44-45 (saying the legislature must find the proposed conveyance in furtherance of the public interest or will not destroy the public’s interest in remaining trust resources). Baer suggests that requiring specific legislative approval before trust resources can be alienated “curtail[s] agency discretion” and gives “elected officials, not agency bureaucrats” “the power to control trust resources,” although this may allow too much congressional interference in agency action. Susan D. Baer, \textit{The Public Trust Doctrine – A Tool to Make Federal Administrative Agencies Increase Protection of Public Land and Its Resources}, 15 B.C. ENVTL. AFF. L. REV. 385, 425 (1988).

\textsuperscript{234} Eichenberg & Vestal, supra note 82, at 349; see also Musiker et al., supra note 224, at 98 (“In sum, the \textit{Mono Lake} decision stands for the proposition that state agencies should undertake advance consideration of public trust values, act to preserve those values, and continually supervise conduct that affects those values.”).

\textsuperscript{235} Sax, \textit{Public Trust}, supra note 215, at 490.
Ocean fish ranching could contravene the public trust doctrine in several ways.\(^{236}\) First, an ocean fish rancher encloses portions of the ocean with net pens for the purpose of commercially cultivating fish. In doing so, she essentially claims an exclusive right to use public resources (surface water, the water column, and the ocean bottom), thus monopolizing trust resources for a private use.\(^{237}\) A second conversion of public trust resources could occur if ocean ranchers appropriate wild fish for their use as seed stock for farmed fish when those fish would otherwise be available for public fishing.\(^{238}\) A third potential violation of the doctrine may arise if ocean fish ranching facilities interfere with traditional public trust activities like fishing and navigation.\(^{239}\) To the extent that ocean fish ranching runs afoul of the public trust doctrine, any governmental action authorizing the closure could be nullified. At a minimum a court would closely scrutinize that action to see if it passes muster under its chosen standard for determining legitimacy of a transfer of trust resources into private hands.

Although a strong case can thus be made that ocean fish ranching violates the public trust doctrine, some states, especially those that see an economic advantage in supporting the industry,\(^{240}\) may be unwilling to apply the doctrine in their waters. They could, with some justification, argue that aquaculture fits comfortably within the doctrine, since “fishing”\(^{241}\) is a long recognized use of

\(^{236}\) See Dowie, *Salmon and the Caesar*, *supra* note 81, at 1 (describing the public trust doctrine as “one of the biggest obstacles faced by the Bush Administration in its plan to promote ocean aquaculture”).

\(^{237}\) See Buzbee, *Recognizing the Regulatory Commons*, *supra* note 6, at 8 (“Aquaculture is, in essence, an effort to privatize the classic common pool resources of fisheries.”).

\(^{238}\) See Eichenberg & Vestal, *supra* note 82, at 357-58 (raising this concern with respect to the removal of shellfish from public waters for private cultivation).

\(^{239}\) Fernandez, *Public Trust, Riparian Rights, and Aquaculture*, *supra* note 16, at 297 (saying traditional fishers “argue that aquaculture conflicts with the public’s right of navigation and fishery”).

\(^{240}\) See Eichenberg & Vestal, *supra* note 82, at 354-55 (setting out aquaculturists’ argument “that the lease fees and economic benefits” should give aquaculture “priority over conflicting uses for trust lands leases”); cf. Gorina-Ysern, *World Ocean Public Trust*, *supra* note 9, at 705 n.227 (blaming the failure to regulate overfishing on governments having “to make decisions that reconcile the objectives of generating employment and income with the imperative of conservation and rehabilitation of fish stocks”).

\(^{241}\) However, aquaculture is more like farming than fishing because it involves raising or cultivating animals not taking or capturing them, which is the essence of fishing. See Pazolt v. Director of the Div. of Marine Fisheries, 631 N.E.2d 547, 551 (Mass. 1994) (finding aquaculture not within boundaries of reserved right of public fishing, and saying “[a]quaculture is a contemporary method of farming shellfish... [I]t is not incidental to or reasonably related to or a natural derivative of the public’s right to fish”); see also *Julia*
public trust resources. State courts may also find sufficient public benefit associated with ocean fish ranching to compensate for the “award of private use” rights, choosing to let that benefit trump the activity’s adverse environmental and socioeconomic impacts. However, whether or not a coastal state applies the public trust doctrine to fish ranching within its territorial waters is beside the point for the purposes of this article, which examines the question of whether the doctrine attaches to the 200 mile federal EEZ. The article now turns to that issue.

A. Extending the Public Trust Doctrine to the EEZ

Even though the oceans and their resources share the attributes of classic public trust resources, making them an excellent candidate for application of the public trust doctrine, it is far from clear that the doctrine actually extends to the waters and resources of the EEZ. The public trust doctrine has been used largely at the state level as a creature of state common law to protect state resources, and there is almost no case law involving

M. Underwood, *Intertidal Zone Aquaculture and the Public Trust Doctrine*, 2 OCEAN & COASTAL L.J. 383, 387-92 (1997) (analyzing Pazolt opinion); Eichenberg & Vestal, supra note 82, at 354 (saying in any state that “narrowly adhere[s] to an historic interpretation of the public trust doctrine,” aquaculture would not be considered a traditional form of fishing). An advantage of aquaculture being considered “fishing” is that the SFA would apply, and NMFS and the Regional Councils would have to take “measures to prevent, mitigate or minimize any adverse effects” from aquaculture activities on essential fish habitats. Englebrecht, *The Magnuson-Stevens Fishery Conservation Act*, supra note 4, at 1213-14 (internal citation omitted); cf. Richard G. Hildreth, *The Public Trust Doctrine and Coastal and Ocean Resources Management*, 8 J. ENVTL. L. & LITIG. 221, 230 (1993) (saying “the public trust doctrine provides little assistance in resolving ocean resource use conflicts, because . . . [it] does not assign priorities among the permissible public trust uses,” and recommending instead “specific rules of use priority” such as favoring renewable uses over nonrenewable ones, non-exclusive uses over exclusive ones, or ocean dependent uses over non-ocean dependent ones).

242. Eichenberg & Vestal, supra note 82, at 354 (saying the “fees and economic benefits . . . [from] aquaculture . . . improve the state’s ability to manage its common resource and increase the common wealth, resulting in a public benefit that adequately compensates for the award of private use of public resources”); see also id. at 372 (saying “[s]tates have an obligation to manage public trust lands to produce public benefits,” and recommending states consider a wide variety of benefits and costs, including “possibility of incompatible uses (e.g., capture fishing, navigation, [and] public recreation) in making this public benefits assessment”).

243. *See, e.g.*, McCready v. Virginia, 94 U.S. 391, 397 (1876) (sustaining Virginia law prohibiting citizens from other states from seeding oysters in Virginia’s tidal waters); Dunham v. Lamphere, 69 Mass. 268 (1855) (upholding law banning purse seines within one mile of Nantucket); Manchester v. Massachusetts, 139 U.S. 240 (1891) (sustaining state law limiting methods for catching menhaden); Blumm & Ritchie, *The Pioneer Spirit*
its application to federal trust resources. However, there are two arguments that can be made for extending the public trust doctrine to the EEZ. One may argue that there is a federal common law public trust doctrine. Or, one may argue that state regulatory authority over fisheries beyond their territorial waters extends the state common law public trust doctrine to the EEZ.

1. The federal government has trust responsibilities in the EEZ.

This part of the article posits that the public trust doctrine attaches to the EEZ because the waters and ocean bottom in the EEZ are public domain lands to which various trust doctrines apply, including the public trust doctrine. Alternatively, the doctrine applies because it attaches to the wild fish that inhabit these public domain waters.

The language of the Magnuson-Stevens Act giving the federal government “sovereign rights” to exploit, conserve, and manage the resources of the “seabed and subsoil and the superjacent waters” makes it clear that the subsoil and waters of the EEZ are within the public domain. Congress’s explicit assumption “of

and the Public Trust, supra note 18, at 695 (describing Smith v. Maryland, 59 U.S. 71, 75 (1855), as holding that Maryland’s “proprietary interest in submerged lands” gave it regulatory authority over “the taking of oysters embedded within its tidelands”); see also Dowie, supra note 81, at 2 (quoting an unnamed New York state decision saying “[t]he control and regulation of navigable waters and tideways was a matter of deep concern to sovereign governments dating back to the Romans. . . . The entire ecological system supporting the waterways is an integral part of them and must necessarily be included within the purview of the trust.”).

244. The title that states have to the soils under navigable waters, “necessarily carries with it control over the waters above them.” Ill. Cent. R.R. v. Illinois, 146 U.S. 387, 452 (1892). A similar principle applies to the federal government. United States v. Rio Grande Dam & Irrigation Co., 174 U.S. 690, 703 (1899) (“First, that, in the absence of specific authority from congress, a state cannot, by its legislation, destroy the right of the United States, as the owner of lands bordering on a stream, to the continued flow of its waters, so far, at least, as may be necessary for the beneficial uses of the government property; second, that it is limited by the superior power of the general government to secure the uninterrupted navigability of all navigable streams within the limits of the United States.”).

245. On possible constitutional sources for a federal public trust doctrine, see United States v. Ruby Co., 588 F.2d 697, 704 (9th Cir. 1978) (finding a basis for the public trust doctrine in the Property Clause); Baer, supra note 232, at 424-425 (finding potential constitutional support for the doctrine in the “penumbra of unenumerated rights” in the Ninth Amendment).

sovereign rights and exclusive fishery management authority over all fish' in the EEZ. . . . indisputably encompasses all rights to fish in the EEZ. Therefore, the EEZ is on a par with terrestrial lands managed by the federal government; they are both within the public domain.

However, arguing that the EEZ is within the public domain does not automatically invoke the public trust doctrine because the doctrine has rarely been applied to public lands. However, this is because there is no need to apply the doctrine to terrestrial public domain lands: a variety of federal laws already impose trust obligations on the federal government with respect to those lands. The federal government holds all of its lands and waters in

amendments to the Magnuson Act and saying "[p]ursuant to the Magnuson Act, the 'conservation and management of the EEZ' belongs to the sovereign, and this necessarily includes the right to fish in the zone"; Massachusetts v. Andrus, 594 F.2d 872, 891 (1st Cir. 1979) (finding that the Magnuson Act is "no less an assertion of a federal interest in conserving fishery resources in the waters of the Outer Continental Shelf" than the OCSLA itself was with respect to the development of oil and gas resources of the subsoil and seabed in the same area); Parravano v. Babbitt, 861 F. Supp. 914, 928 (N.D. Cal. 1994) (finding the Magnuson Act confers on the Secretary of Commerce authority to manage the fishery resources in the EEZ for conservation. It does not confer on commercial fishermen any right or title in the fishery resources under the Department of Commerce's authority.). Although the Magnuson Act allowed states to retain regulatory jurisdiction over fisheries within their waters, the federal government can intervene "if the Secretary [of Commerce] finds that state action or inaction . . . will 'substantially and adversely affect' an FMP covering a fishery that is predominately within the EEZ." Christie, Living Marine Resources Management, supra note 12, at 164-65 (quoting 16 U.S.C. § 1856(b) (Westlaw 2000)).


248. But see United States v. Burlington N. R.R. Co., 710 F. Supp. 1286, 1287 (D. Neb. 1989) (finding the federal government could sue to recover for damages to one of its wildfowl production areas as parens patriae, noting public trust doctrine has been applied to the federal government, even though it has more "traditionally been asserted by the States"); City of Alameda v. Todd Shipyards Corp., 632 F. Supp. 333, 335-37, 341 (N.D. Cal. 1985) (applying public trust doctrine to void conveyance by United States of former tidelands to a private party and imposing on federal government the duty "to hold the land in trust for navigation and public use"); United States v. 1.58 Acres of Land, 523 F. Supp. 120, 124-25 (D. Mass. 1981) (holding public trust doctrine restricted both Massachusetts' and federal government's prerogatives with respect to submerged lands); In re Steuart Transp. Co, 495 F. Supp. 38, 40 (E.D. Va. 1980) (relying on public trust and parens patriae doctrines to allow federal recovery of damages for wildlife killed by oil spill and saying "state of Virginia and the United States have the right and duty to protect and preserve the public's interest in natural wildlife resources"); cf. Palila v. Haw. Dep't of Land & Natural Res., 471 F. Supp. 985, 995 n.40 (D. Haw. 1979), ("The importance of preserving such a natural resource [an endangered species] may be of such magnitude as to rise to the level of a federal property interest.").

trust for the citizens of the United States, and courts have repeatedly impressed these statutory trust duties on federal agencies with respect to their public resources management decisions.


250. Even before these laws were enacted, courts considered that the federal government had trust responsibilities over the public domain and that these lands “should be protected for future generations.” Baer, supra note 232, at 391-92 (citing Knight v. United States Land Ass’n, 142 U.S. 161, 181 (1891) impressing on the Secretary of the Interior, as “guardian of the people of the United States over the public lands,” the duty neither to waste those lands nor to dispose of them to people who were not entitled to them); see also Light v. United States, 220 U.S. 523, 537 (1911) (finding federal government had trust responsibilities over the national forests on behalf of “the people of the whole country”); United States v. Trinidad Coal & Coking Co., 137 U.S. 160, 170 (1890) (noting that the United States’ land is “held in trust for all the people”); United States v. Beebe, 127 U.S. 338, 342 (1888) (noting that the federal government holds public domain lands in trust, and saying “[t]he government is charged with the duty, and clothed with the power, to protect it [the public domain] from trespass and unlawful appropriation”).

251. See, e.g., Sierra Club v. Dep’t of the Interior, 398 F. Supp. 284, 287 (N.D. Cal. 1975) (following holding in Knight v. United States Land Ass’n, 124 U.S. 161 (1891), that Secretary of Interior is bound both by statutory duties to protect national park resources and the public trust); Kleppe v. New Mexico, 426 U.S. 529 (1976) (upholding federal government’s authority over wild horses and burros on federal lands under the Property Clause); Light, 220 U.S. at 537 (saying “it is for Congress to determine” how the trust will
The government's statutory trust responsibilities over its lands mirror those underlying the common law public trust doctrine. Whenever the federal government decides to sell, lease, permit, or develop these lands in any way, it has a duty to protect the public interest in them. With limited exceptions, these lands are accessible to the public and not available for individual appropriation. The government's responsibilities over these lands are irrevocable, and the public can call the government to account if it shirks its trust responsibilities. In such situations, applying the common law public trust doctrine would be redundant, since a statutory responsibility is functionally equivalent. Therefore, it is no surprise that no court has ever specifically applied the doctrine to federal public lands. However, no pervasive federal regulatory program exists to protect the resources of the EEZ, thus necessitating the application of the public trust doctrine.

It is no answer to conflate the absence of judicial implementation of the federal common law version of this doctrine with an indication that no such doctrine exists. In other words, merely because public lands are already protected under laws that contain equivalent trust concepts does not mean that there is no federal public trust doctrine. No federal court has

252. See, e.g., the Federal Land Policy & Management Act, 43 U.S.C. § 1713 (authorizing the sale of public domain lands only where "disposal of such tract[s] will serve important public objectives").

253. See, e.g., Camfield v. United States, 167 U.S. 518 (1897) (holding the federal government can prevent construction of fence on private land if the effect is to enclose public lands); United States v. Curtis-Nevada Mines, Inc., 611 F.2d 1277 (9th Cir. 1980) (holding the federal government, as trustee of nation's public lands, can prevent the owner of an unpatented mine claim from restricting public access to, and recreational use of, the surface of his claim).

254. Knight, 142 U.S. at 181 ("The secretary is the guardian of the people of United States over the public lands. The obligations of his oath of office oblige him to see that the law is carried out, and that none of the public domain is wasted or is disposed of to a party not entitled to it. He represents the government, which is a party in interest in every case involving the surveying and disposal of the public lands.").

255. See, e.g., Sierra Club v. Dep't of the Interior, 398 F. Supp. 284 (N.D. Cal. 1975) (finding Department of Interior had both a statutory and a trust duty to conserve scenery and natural resources, including wildlife).

256. See supra Part I.D.

257. See District of Columbia v. Air Florida, Inc., 750 F.2d 1077, 1085 (D.C. Cir. 1984) (saying the court "must determine whether the public trust duties that have been recognized under state law as pertaining to state governments also apply to the federal government when it holds title to the shores and bed of a river"). While the court declined
ever abrogated the doctrine or said that it does not apply to public lands should there be a reason to invoke it. The doctrine in its original incarnation applied to the King, and although in this country the doctrine became a feature of state law, that is because the people took on the attributes of sovereignty, which then passed to the states. However, since “federal and state governments each exist for the benefit of the members of the public each serves,” and each “holds title to land and natural resources as a representative of members of the public each serves,” there seem to be good reasons to apply the doctrine to the federal government in that case because the argument was raised for the first time on appeal, it cited 1.58 Acres of Land, and Steuart as proof that federal courts have applied it to the federal government. Id. at 1083-84; see Baer, supra note 232, at 408 (saying the absence of the federal government from the case and the possibility that the Rivers and Harbors Appropriation Act “may preempt all, or part, of the government’s alleged federal common law duties” also persuaded the court not to entertain the District’s public trust argument); see also Dowie, Salmon and the Caesar, supra note 81, at 3 (saying the Supreme Court’s failure to declare the public trust doctrine federal common law “doesn’t mean the public trust doctrine is not federal; it just means it has never been established as such”). But see Eric Pearson, The Public Trust Doctrine in Federal Law, 24 J. LAND RESOURCES & ENVTL. L. 173, 175 (2004) (saying “to the extent [the federal public trust doctrine] has force and effect in federal law at all, [it] supplements federal power rather than restricts it,” and in this respect is quite “divergent” from the doctrine under state law).

258. See, e.g., Martin v. Waddell, 41 U.S. 367, 410 (1842) (“[W]hen the Revolution took place, the people of each State became themselves sovereign; and in that character held the absolute right to all their navigable waters, and the soils under them, for their own common use, subject only to the rights since surrendered by the constitution to the general government.”).

259. Pearson, The Public Trust Doctrine in Federal Law, supra note 256, at 177. Pearson also points out that the Property Clause basis for the federal government to manage public lands “is essentially indistinguishable from the constitutional authority” for the states’ police power and that both authorities “are exceedingly broad.” Id. But see Baer, supra note 232, at 423 n.302 (citing Nevada v. United States, 512 F. Supp. 166, 172 (D. Nev. 1981) (distinguishing the federal government’s trust responsibilities over the country’s natural resources from those of a private trustee with respect to the assets it holds) and Alabama v. Texas, 347 U.S. 272, 277 (1954) (Reed, J., concurring) (making same distinction)). See also Massachusetts v. Andrus, 594 F.2d 872 (1st Cir. 1979), quoted in Lewis, Public Trust Doctrine, supra note 248, at 69 (“The . . . Court characterized the Secretary of the Interior as the ‘guardian’ of the public domain, whose legal duty embraces a solemn responsibility to see that the great life systems of the ocean are not unreasonably jeopardized by activities undertaken to extract oil and gas from the seabed.”); Utah Power & Light Co. v. United States, 243 U.S. 389, 405 (1917) (“[I]nclusion within a state of lands of the United States does not take from Congress the power to control their occupancy and use, to protect them from trespass and injury, and to prescribe the conditions upon which others may obtain rights in them . . . .”); Kleppe v. New Mexico, 426 U.S. 529, 539 (1976) (“[W]hile the furthest reaches of the power granted by the Property Clause have not yet been definitively resolved, we have repeatedly observed that ‘[t]he power over the public land thus entrusted to Congress is without limitation.’” (quoting United States v. San Francisco, 310 U.S. 16, 29 (1940))).
arguments that the doctrine could apply to the federal waters of the EEZ.

However, for there to be a federal common law of public trust, the activity or subject matter area must be one where courts can create federal common law. Courts do not create federal common law lightly. In fact, they only do so when “a federal rule of decision is ‘necessary to protect uniquely federal interests,’” or where Congress has explicitly “given the courts power to develop substantive law.” Since Congress has not empowered the courts to develop substantive law with respect to aquaculture, only the first rationale holds any promise.

The Supreme Court has interpreted the first rationale as requiring a showing that “our federal system does not permit the controversy to be resolved under state law, either because the authority and duties of the United States as sovereign are intimately involved or because the interstate or international nature of the controversy makes it inappropriate for state law to control.” Thus, for there to be a federal common law of public trust, the courts “must find that a federally recognized public trust doctrine implicates ‘uniquely federal interests,’ and where ‘the authority and duties of the United States as sovereign are intimately involved,’ such a unique federal interest can be found.” It is not hard to see that “uniquely federal interests” are involved on the EEZ. The mere possibility that interstate, or even international, controversies, which only the federal government

260. See Tex. Indus., Inc. v. Radcliff Materials, Inc., 451 U.S. 630, 638 (1981) (saying federal rights are created either by Congress, “expressly or by clear implication,” or by federal courts in limited circumstances); see also Lewis, supra note 248, at 71 (“The Supreme Court has recognized the need and authority of courts to fashion federal common law in a ‘few and restricted’ instances.” (quoting Texas Industries, 451 U.S. at 640)).

261. Texas Industries, 451 U.S. at 640 (internal citations omitted).

262. Id. at 641.

263. J. Wallace Malley, Jr. & Jeffrey M. Silverstein, The Public Trust Doctrine and Federal Condemnation: A Call for Recognition of a Federal Common Law, 15 VT. L. REV. 501, 520-521 (1991). The development of this line of argument owes much to Malley and Silverstein’s article, notwithstanding that they apply the doctrine to public lands that the federal government wants to condemn and turn over to private interests, rather than to the EEZ. Lewis argues that the restrictions on fashioning federal common law should not apply because “the roots of the public trust doctrine are believed to reach back to the constitution, or to the State Enabling Acts.” Lewis, supra note 248, at 63 n. 68 (citing Charles F. Wilkinson, The Headwaters of the Public Trust: Some of the Traditional Doctrine, 19 ENVTL. L. 425, 458-59 (1989) (saying the doctrine derives from statehood acts or from the Commerce Clause, like the navigational servitude which then passed to the states upon statehood)).
can resolve, could arise on the EEZ should be sufficient to create a “uniquely federal interest” in the area. Additionally, the Magnuson-Stevens Act, the Endangered Species Act, and other comparable statutes create uniquely federal duties in those waters.\(^{264}\)

While Congress can always oust federal common law,\(^{265}\) until that happens federal courts can continue to create federal common law and apply it.\(^{266}\) Here there are no preemptive federal

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\(^{264}\) Malley and Silverstein additionally maintain that Illinois Central R.R. "seems to suggest that a sovereign's duty to observe the trust may never be lost;" therefore, federal condemnation of that property merely transfers that duty to the federal sovereign for as long as it holds the land. Malley, Jr. & Silverstein, Public Trust Doctrine, supra note 262, at 521. They also propose two other theories that might justify a federal common law public trust doctrine: the first theory would consider the state and federal governments co-trustees, with the federal government having dominant power in any situation where its interests might conflict with those of the state's, relying on United States v. 1.58 Acres of Land, 423 F. Supp. 120, 123 (D. Mass. 1981); the second theory would recognize the United States as a "temporary" sole trustee until the land passes back to the state, relying on Shively v. Bowlby, 152 U.S. 1 (1893) and United States v. 11.037 Acres of Land, 685 F. Supp. 214 (N.D. Cal. 1988). Malley, Jr. & Silverstein, supra note 262, at 521-23; see also Peter Egan, Applying Public Trust Tests to Congressional Attempts to Close National Park Areas, 25 B.C. ENVTL. AFF. L. REV. 717, 729 (1998) (saying since "[t]he federal government was created by the individual states . . . [it] cannot have powers superior to bodies responsible for its creation. . . . [and] [t]herefore, like the states . . . cannot abdicate its public trust responsibilities"); Wilkinson, Headwaters of the Public Trust, supra note 262, at 453-54 (finding the Court's ubiquitous references to "a state" and the absence of citations to any particular state law as justifying his belief the opinion relied on federal law).

\(^{265}\) City of Milwaukee v. Illinois, 451 U.S. 91, 107 (1980) (referring to federal common law of nuisance and saying that until "new federal laws and new federal regulations . . . pre-empt the field . . . . federal courts will be empowered to appraise the equities of the suits alleging creation of a public nuisance by water pollution").
laws involving the management of fishery resources in the EEZ;\textsuperscript{267} Congress has neither spoken directly to the issue nor occupied the field.\textsuperscript{268} Congressional regulation of fishery resources in the EEZ is piecemeal, occasionally creating overlapping agency jurisdictions or areas where there is no regulation at all.\textsuperscript{269} Thus, there is no immediate danger of a federal common law public trust doctrine being ousted from the EEZ by a “comprehensive regulatory program supervised by an expert administrative agency.”\textsuperscript{270} Unlike areas of federal regulation such as water pollution, where the federal government has essentially “occupied the field [so] as to displace” federal common law,\textsuperscript{271} in the fishery context there are, in fact, significant “interstices” that need to be filled by the use of a federal common law doctrine.\textsuperscript{272}

A second basis for finding that the federal government has trust responsibilities over the EEZ and its resources is through the wildlife trust.\textsuperscript{273} Although the idea that states own wildlife, including fish,\textsuperscript{274} was overturned in Hughes v. Oklahoma,\textsuperscript{275} the

\textsuperscript{267} See supra pp. 30-32. [discussion lack of federal regulatory programs]

\textsuperscript{268} See Milwaukee, 451 U.S. at 313 (saying federal common law applies “[w]hen Congress has not spoken to a particular issue”).

\textsuperscript{269} See infra Part IV.A.

\textsuperscript{270} Milwaukee, 451 U.S. at 317.

\textsuperscript{271} Malley, Jr. & Silverstein, supra note 262, at 526.

\textsuperscript{272} See id. (citing Milwaukee, 451 U.S. at 324, for the proposition that “[n]o interstices remained to be filled by the continued use of federal common law” in the context of the Clean Water Act); see also Lewis, supra note 248, at 59 (commenting that the federal courts’ reluctance “to embrace the public trust doctrine is not warranted” because federal statutes have not “wholly occupied” the field of water resources management and that “the finding of a duty on the part of a federal agency is entirely appropriate and a proper complement to existing state law where the threatened harm is not addressed by a state resource protection statute,” and thus there is no need for courts to abstain).

\textsuperscript{273} See generally Wood, supra note 222, at 608; Babcock, Protecting Where the Wild Things Are, supra note 217, at 882.

\textsuperscript{274} See, e.g., People v. Truckee Lumber Co., 48 P. 374, 399-400 (Cal. 1897) (enjoining operation of private sawmill that was polluting the Truckee River, and saying “[t]he fish within our waters, constitute the most important constituent of that species of property commonly designated as wild game, the general right and ownership of which is in the people of the State . . . ; and the right and power to protect and preserve such property for the common use and benefit is one of the recognized prerogatives of the sovereign, coming to us from the common law . . . .”); Pullen v. Ulmer, 923 P.2d 54, 57 (Alaska 1996) (“[S]almon are public assets of the state which may not be appropriated by initiative.”); Attorney Gen. v. Hermes, 339 N.W.2d 545, 550 (Mich. Ct. App. 1983) (authorizing state to bring civil action for damages for unlawful taking of perch and whitefish from public waters because the “state is ‘public trustee’ of these resources, which are held in trust for all the people of the state in their collective capacity”); see also Blumm & Ritchie, The Pioneer Spirit and the Public Trust, supra note 162, at 708 n.236 (listing state cases that have “judicially endorsed . . . wildlife trust principles,” including many involving
concept of a wildlife trust still has currency today. In American jurisprudence, the "rule of wildlife capture . . . has always been fitted to meet the felt necessities of societies that employed it . . . [and] has always been restrained by state authority."277 This state authority includes the wildlife trust doctrine because "the rule of capture and the wildlife trust are inextricably tied, and they have been—in one form or another—for centuries."278 Thus, to the extent the application of the rule of capture has given fishers

fish). Wood suggests using the wildlife trust to interpret federal laws to "force a sea-change" in how the FWS implements section 7(a)(2) of the Endangered Species Act by limiting the agency’s discretion. Wood, supra note 222, at 613, 617-18; (saying the "[t]he sheer scope of ESA federal regulation now demands" application of "broader trust principles," displacing whatever claims states might have to regulatory primacy).

275. 441 U.S. 322 (1979). The state ownership doctrine held sway until the early twentieth century when the Court began to reject it, first as "a slender reed," Missouri v. Holland, 252 U.S. 416, 434 (1920) (sustaining constitutionality of Migratory Bird Treaty Act), then as "a fiction expressive in legal shorthand of the importance to its people that a State have power to preserve and regulate the exploitation of an important resource," Toomer v. Witsell, 334 U.S. 385, 402 (1948) (rejecting the notion of exclusive state authority over shrimp), then as "pure fantasy," Douglas v. Seacoast Products, Inc, 431 U.S. 265, 284 (1977), until finally in it was firmly overturned in Hughes. Macinko & Bromley, Seeking Coherence from Legal and Economic Doctrines, 28 VT. L. REV. 623, 630-31 (2004) (summarizing the state ownership doctrine’s "demise"). Macinko and Bromley believe that even though the "popular legacy" of the doctrine’s death says it is about ownership of wildlife, its end was not about who owned fish, but about federalism. Id. at 633-34 ("Ownership of wildlife, by the states, is problematic not so much because it is ownership of an elusive object (ferae naturae), but because it can be used as an advantage in the age-old struggle between state and federal authority that is federalism.").

276. See Blumm & Ritchie, Background Principles as Categorical Takings Defenses, supra note 215, at 352 n. 205 (characterizing Supreme Court opinions “dismiss[ing] the state ownership doctrine” as “narrow, overriding the states’ proprietary interest in wildlife only when it conflicts with federal law”); Blumm & Ritchie, The Pioneer Spirit and the Public Trust, supra note 18, at 706 (“[Hughes] did not dislodge the states’ trustee relation with wildlife that had been confirmed in Geer.”); Oliver A. Houck, Why Do We Protect Endangered Species, and What Does That Say About Whether Restrictions on Private Property to Protect Them Constitute “Takings”, 80 IOWA L. REV. 297, 311 n.77 (1995) (saying Hughes “did not, and could not, overrule principles dating back to Roman Law” and that “[t]he trust analogy announced in Geer . . . remains the most accurate expression of this state interest”); Wood, supra note 222, at 609 n.17 (distinguishing between the “derivative” state ownership doctrine and the “broad principles of sovereign trust over wildlife”).

277. Blumm & Ritchie, The Pioneer Spirit and the Public Trust, supra note 18, at 720. For a more thorough discussion of the origins of the rule of capture and its development and replacement by the state ownership of wildlife doctrine, see generally Blumm & Ritchie, The Pioneer Spirit and the Public Trust, supra note 18.

278. Id. at 720; see also Dale Goble, Three Cases/Four Tales: Commons, Capture, the Public Trust, and Property in Land, 35 ENVTL. L. 807 (2005) (examining the rule of capture). The rule of capture is best set out in “the American keystone” case of Pierson v. Post, 3 Cai. 175 (N.Y. Sup. Ct. 1805), involving a hapless fox and setting out the principle that “the first to control property acquires ownership of it.” Frank Lupo, The Rule of Capture and Its Consequences, 35 ENVTL. L. 647, 647 (2005).
ownership of fish, that ownership has long been constrained by trust concepts, most importantly the sovereign's duty to protect the trust res—fish.

The existence of a wildlife trust means that the government exercises its power over wildlife for the public's benefit, and not for its own interests or for the benefit of private entities.279 Wood suggests that the doctrine's "foundational principles apply to protecting biodiversity as a whole," not just game animals,280 its traditional focus.281 In this, the wildlife trust doctrine and the public trust doctrine are parallel.282 "The public trust doctrine protects natural resources, and therefore the public, from the failure of legislatures, state agencies, and administrative personnel

279. Geer v. Connecticut, 161 U.S. 519, 529 (1896), quoted in Macinko & Bromley, Seeking Coherence from Legal and Economic Doctrines, supra note 274, at 630; see also Babcock, Protecting Where the Wild Things Are, supra note 217, at 885-86 (saying when the Court overruled Geer in Hughes, it pointedly left the concept of a state wildlife trust standing); Goble, Three Cases/Four Tales, supra note 277, at 853 ("[T]he public's interest in wildlife—whether characterized as a trust, state ownership, state custodianship, or a 'substantial interest in preserving' such animals—gives the state a special authority and responsibility to ensure the preservation of wildlife.").

280. However, the wildlife trust doctrine's traditional focus on protecting harvesting of game as a "valuable food supply," has direct application to protecting valuable food supply of wild fish. Geer, 161 U.S. at 534.

281. Wood, supra note 222, at 611; see also id. at 643 (saying "[a] trust framework treats biodiversity as a natural asset held in trust by the sovereign for the benefit of the public, including both present and future generations," imposing on the sovereign trustee the "continuing and inalienable duty to protect the corpus of the trust"); Johnson & Galloway, The Public Trust Doctrine, supra note 212, at 30 (saying the public trust doctrine "has a great potential for protecting biodiversity"); Bader, Public Trust Doctrine, supra note 216, at 756 (advocating using public trust doctrine "to maintain the general health of natural systems"); Goble, supra note 277, at 853 (finding "ample power to conserve the nation's biodiversity and the ecosystem services on which we depend").

282. See Wood, supra note 222, at 608 ("The wildlife trust doctrine [is] a branch of the well-known public trust doctrine . . . ."); Blumm & Ritchie, The Pioneer Spirit and the Public Trust, supra note 18, at 714 ("[B]ecause the sovereign trusteeship over wildlife is part of a larger body of law concerning 'public trust' principles that developed outside the context of wildlife regulation, public trust law remains directly relevant to states' wildlife trust responsibilities."); id. at 695 (quoting Smith v. Maryland, 59 U.S. (18 How.) 71, 76 (Curtis, J.) (holding that the state's power over harvesting of oysters "results from the ownership of the soil, from the legislative jurisdiction of the State over it, and from the duty to preserve unimpaired those public uses for which the soil is held"); Meyers, Protection of Wildlife, supra note 212, at 729 (noting similarities between wildlife and water because neither can be owned and to the extent they can be owned, ownership is an attribute of sovereignty); id. (citing Geer, 161 U.S. at 525, for the proposition that wildlife is a type of community property that, "having no owner, [was] considered as belonging in common to all citizens of the state"); Macinko, Public or Private: U.S. Commercial Fisheries, supra note 26, at 940 ("The core meaning of the public trust doctrine is found in the class relations of old world game laws . . . [and] in a 19th century struggle between populist and progressive visions for the American political economy.").
to recognize the state's duty to protect the corpus of the wildlife trust for future generations.\footnote{283}

Furthermore, the concept of a wildlife trust, like the public trust doctrine, is not restricted to the states. Wood asserts that "[state] cases make clear that the wildlife trust arises as an attribute of sovereignty" and thus should apply to the federal, as well as state, sovereign.\footnote{284} She argues, with respect to the species listed under the Endangered Species Act, that the federal government has "a public trustee's duty of care" arising out of its assertion of regulatory authority over those species, and that those species, in turn, are "definable [trust] asset[s]. . . and are owed traditional protections deriving from property law accorded to public natural assets."\footnote{285} The same rationale should apply to fish given the existence of analogous federal legislation protecting fish.\footnote{286}

Thus, while

\[\text{[t]he issue of the existence of the federal public trust doctrine has not yet been settled by the courts; arguably the federal government should be subject to the same fiduciary responsibility as the state governments in managing the resource for the benefit of the public, and should not be able to terminate public interests or convey an interest in this property without an explicit finding of public benefit.}\footnote{287}

2. Alternatively, the state-based public trust doctrine extends to the EEZ.

Courts and commentators appear to agree that the public trust doctrine applies to "the three nautical mile belt created by the SLA" around the United States coastline, even though the statute is silent about imposing public trust obligations on states.\footnote{288} If one

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283. Musiker et al., supra note 224, at 109.
284. Wood, supra note 222, at 614-15; see also id. at 616 (quoting Charles F. Wilkinson, The Public Trust Doctrine in Public Land Law, 14 U.C. DAVIS L. REV. 269, 299 (1980) ("Thus we can expect courts today, like courts in earlier eras, to characterize Congress' modern legislative scheme as imposing a public trust on the public resources.").)
287. Eichenberg & Vestal, supra note 82, at 347.
288. Hildreth, supra note 240, at 229; see also id. (saying there is little debate about}
adopts the view that the public trust doctrine is a creature of state common law, the challenge becomes finding sufficient state presence in the waters of the EEZ for its application. That basis can be found both in the states' historical and continuing regulatory presence over fisheries—including those found in the EEZ—and in the authority the CZMA gives to states, allowing them to disapprove of a federal activity that will affect their coastal zones in a way that is inconsistent with their coastal zone management plans ("CZMPs"). To the extent that coastal states have explicitly or implicitly incorporated public trust principles into their CZMPs, and fish ranching activities will affect individual states' coastal zones, then these principles will extend to applications by ocean fish ranchers for federal authorization to conduct their activities in the EEZ. Each of these points is developed more fully below.

A "significant proportion of fisheries resources occur within state waters," and decisions about how those resources are to be managed have profound social and economic effects on local communities. As a result, states have historically managed the doctrine applying to "state internal waters," such as estuaries, bays, embayments, and sounds, i.e. those waters "landward of the baseline from which the U.S. territorial sea is measured").

289. Lewis argues that federal courts can apply state common law public trust doctrine principles in diversity cases (citing Erie Railroad Co. v. Tompkins, 304 U.S. 64 (1938), noting that most public trust claims heard by courts have been in diversity cases). Lewis, supra note 248, at 59-60.

290. See, e.g. Magnuson-Stevens Fishery Conservation & Management Act of 1976, 16 U.S.C § 1856(b) (Westlaw 2006) (retaining state jurisdiction to manage fish stocks within state territorial waters and preempting that jurisdiction only when Secretary of Commerce finds state action or inaction will adversely affect implementation of fish management plan for a fishery that is predominantly within the EEZ); see id. § 1856(a)(3) (authorizing states to regulate fishing vessels outside state territorial waters under certain circumstances); Submerged Lands Act of 1953, 43 U.S.C. § 1311(a) (Westlaw 2006) (granting states "title to and ownership of . . . natural resources," including the "right and power to manage, administer, lease, develop, and use" marine resources). See also Christie, Living Marine Resources Management, supra note 12, at 164-68 (describing federal and state jurisdiction over fishery resources).


292. Christie, Living Marine Resources Management, supra note 12, at 164. Commons scholars, like Ostrom and McCay, have searched for alternative solutions to privatization and regulation as a means of avoiding the despoliation of the commons, most frequently turning to local control emanating from the communities that depend on fishing for their livelihoods. But these solutions have problems as well. What may be sufficient to solve the problems of a local fishery for a discrete species fails when extended to regional, let alone
fisheries whether or not the fish were within their waters, and have retained regulatory authority over fish that leave their waters and travel into the EEZ. This authority continues so long as there is either no federal Fisheries Management Plan ("FMP") or other preemptive federal regulation, or when there is an FMP or federal regulation consistent with state law. Courts have held that where there is no conflict with federal or international law, "a state's interest in preserving nearby fisheries is sufficiently strong to permit such extra-territorial enforcement of its laws enacted for that purpose." Fishing boats registered under state law remain within that state's regulatory jurisdiction, even when those boats fish in the EEZ.

Briscoe writes that regulation of fisheries "provides the classic model for extra-territorial exercise of the police power." Thus, "a state may reasonably extend its jurisdiction to control fish and game resources outside the limited area of its territorial sovereignty, if such an exercise is based on the conservation principles inherent in their [fish's] migratory characteristics.

In addition, states, under the aegis of their coastal zone national or international fisheries for many different species. See Buzbee, Recognizing the Regulatory Commons, supra note 6, at 25 (saying "oceans and their resources are an obvious . . . mismatch" with the regulatory authority); Christie, Living Marine Resources Management, supra note 12, at 112 (discussing inability of states to manage distant water and foreign fishing fleets).

293. See Christie, Living Marine Resources Management, supra note 12, at 111; see also Skiriotes v. Florida, 313 U.S. 69, 77 (1941) (recognizing a state's right to regulate fishing by its citizens beyond state waters, saying "If the United States may control the conduct of its citizens upon the high seas, we see no reason why the State of Florida may not likewise govern the conduct of its citizens upon the high seas with respect to matters in which the State has a legitimate interest and where there is no conflict with acts of Congress"); see also id. (quoting State v. Bundrant, 546 P.2d 530, 552, 554-56 (Alaska 1976) (holding that the importance of a crab fishery gave the state "legitimate interest" in its offshore regulation)).

294. 16 U.S.C. § 1856(a)(3)(A) (Westlaw 2006). Even after the Magnuson Act was amended in 1996, considerable confusion remained over the extent to which federal law preempted state laws regulating fishing boats by continuing to allow states significant regulatory authority over these boats, including boats not registered under their laws. Christie, Living Marine Resources Management, supra note 12, at 165-66. But see id. at 166 n.428 (noting several courts have found more restrictive state regulations "inconsistent" with the limits set in a FMP).


297. Briscoe, supra note 294, at 278.

298. Bundrant, 546 P.2d at 554, quoted in Briscoe, supra note 292, at 278; but see id. n.114 (questioning the decision's viability after the Magnuson Act).
management programs, can determine the consistency of federal activities in the EEZ with their laws.\textsuperscript{299} For example, the CZMA's consistency provisions have been applied to offshore oil and gas leasing programs in the waters off Massachusetts\textsuperscript{300} and California.\textsuperscript{301} Ocean fish ranching can directly affect fishery resources in the coastal zone through disease, pollution, and escaped fish, as well as the economic livelihood of coastal fishing communities. Therefore, these impacts should be cognizable under the CZMA.\textsuperscript{302}

Many states have incorporated public trust principles into their laws, and, in some cases, their constitutions.\textsuperscript{303} To the extent that these laws are part of the "enforceable policies"\textsuperscript{304} of an approved state coastal zone management plan, then state common law public trust principles incorporated into those plans extend to the EEZ. These principles can be applied to stop ocean fish ranching activities that prevent access to the waters and resources of the EEZ on the ground that such limitations are inconsistent with the state's coastal zone management plan. In the alternative, these principles might also be used to reform fish ranching activities. For instance, the state could move the location of the net pens so that

\textsuperscript{299} See Briscoe, supra note 294, at 283-85 (discussing the reach of the CZMA to federal activities beyond state waters, and noting that passage of the SLA "enhanced" the states' consistency powers by dropping language from that act which had limited a state's consistency power to federal activities directly affecting their coastal zones); see also Englebrecht, supra note 4, at 1204 (saying federal consistency review "is required for any federally funded or authorized project located in the Exclusive Economic Zone . . . [thus affording states] some say in the regulatory process for aquaculture projects in federal waters adjacent to their boundaries").


\textsuperscript{301} Exxon Corp. v. Fischer, 807 F.2d 842 (9th Cir. 1987), cited in Schatzberg, supra note 5, at 275.

\textsuperscript{302} See Schatzberg, supra note 5, at 275-76 (saying that because of the "risks" associated with ocean aquaculture, "offshore salmon fish farming may affect Alaska's and Washington's coastal zones in ways inconsistent with the habitat protection goals included in both states' enforceable policies").

\textsuperscript{303} See, e.g., Owsichek v. State Guide Licensing & Control Bd., 763 P.2d 488, 493 (Alaska 1988) (noting that the purpose of the Alaska Constitution's "common use" clause "was achieved by constitutionalizing common law principles imposing upon the state a public trust duty with regard to the management of fish, wildlife and waters"); Dowie, supra note 81, at 2 (saying that Louisiana, among other states, wrote the public trust doctrine "directly" into its constitution).

\textsuperscript{304} 16 U.S.C. § 1456(c)(1)(A) (Westlaw 2006) (Each Federal agency activity within or outside the coastal zone that affects any land or water use or natural resource of the coastal zone shall be carried out in a manner which is consistent to the maximum extent practicable with the enforceable policies of approved State management programs.)
they do not interfere with commercial fishing, thereby ensuring consistency with the public trust. In summary, the public trust doctrine can apply to ocean aquaculture on any of several grounds: (1) the EEZ is federal land to which the public trust attaches; (2) there is an independent federal common law doctrine; (3) state common law doctrine applies to the waters of the EEZ because state regulatory authority extends into the EEZ; or (4) state common law doctrine applies to the waters of the EEZ because of the operation of the CZMA.

V. APPLYING THE PUBLIC TRUST DOCTRINE WOULD FILL A REGULATORY GAP AND MAKES GOOD POLICY SENSE

Currently, there is no effective and comprehensive regulatory regime governing ocean fish ranching.305 There is no clear sense of "which laws apply and which agency is accountable for oversight at different stages of aquaculture ventures."306 The current "piecemeal approach [to ocean fish ranching] has resulted in gaps and inefficiency."307 Applying the public trust doctrine would protect ocean resources from the adverse impacts of fish ranching until a comprehensive, effective regulatory program evolves to fill those gaps—something privatizing those resources cannot do.308 Further, applying the public trust doctrine makes good policy sense, as it "imposes a duty" on government to protect natural resources that exceeds any it has under specific enabling laws or police power authority.309

305. Englebrecht, supra note 4, at 1199 (saying "this piecemeal approach has left many environmental impacts overlooked, particularly the protection of essential marine habitat"); Buzbee, Recognizing the Regulatory Commons, supra note 6, at 9 ("The mixed-media nature of aquaculture and its risks, coupled with the lack of any one prime regulator, has to date left aquaculture subject to incomplete and arguably ineffective regulation."). Buzbee goes on to say that the emergence of a primary regulator seems unlikely given the fact that there is no governmental institution with the jurisdictional reach to address the broad ecosystem risks of aquaculture, id. at 9-10, and "potential regulators have few incentives to see aquaculture as an attractive subject of regulation." Id. at 10.


307. Id. at 1202.

308. See, e.g., Richard J. Lazarus, Changing Conceptions of Property and Sovereignty in Natural Resources: Questioning the Public Trust Doctrine, 71 IOWA L. REV. 631 (1986); James L. Huffman, A Fish Out of Water: The Public Trust Doctrine in a Constitutional Democracy, 19 ENVTL. L. 527 (1989) (saying that the expansion of the doctrine's scope has taken it beyond its legal roots in property law); See generally supra Part II. The realization that there is a regulatory gap should quell objections by some scholars to the use of the public trust doctrine where there are effective regulatory frameworks.

309. Musiker, supra note 224, at 114-15 (saying that this duty "extends beyond any
A. The Disabling Effect of Regulatory Gaps

The regulatory context for ocean fish ranching exemplifies what Professor Buzbee labels a "regulatory commons." A regulatory commons arises when more than one potential regulator shares potential jurisdiction over "a regulatory opportunity" and there is "a mismatch" between the regulators' jurisdictions and the injurious activity's causes and effects. In other words, "the underlying social ill... lacks a matching political-legal regime." A regulatory commons is problematic because it means that those searching for regulation will "fragment" their demands because they will not know where to go to get relief, thus unintentionally diminishing the regulator's perception that there is a problem that she should address. A regulatory commons also creates disincentives for regulators to step in and take initiative, leaving some "social ills" under-regulated or entirely unregulated.
Buzbee believes that "complex legal systems create predictable dynamics that create incentives for regulatory gaps." The resulting "uncertain regulatory turf" creates "demand and supply-side incentives for regulatory inattention." When these incentives are combined with the preference of most regulators and the regulated industry to maintain the status quo, it is unlikely that the regulatory picture will change in the short term.

Buzbee finds that aquaculture is a quintessential example of a regulatory commons because there is no clear principal regulatory authority, let alone one that has any incentive to take the lead in regulating the activity. He blames "environmental federalism"—by which he means "the shar[ing of] regulatory turf in uncertain sorts of ways" between federal, state, and local governments—for "the political-legal fragmentation and overlap." Given the breadth of potential environmental and socioeconomic harms from aquaculture activities, it is unlikely that they will all fall under the regulatory authority of any one jurisdiction. Local officials, who are often in the best position to control particular nearshore aquaculture operations, are instead more interested in promoting these local businesses. Thus, local officials often have no reason to invest in either researching aquaculture’s risks or "policing" its impacts.

Ocean fish ranching exhibits these and other features of a regulatory commons. A regulatory commons exists where the

314. Id. at 6.
315. Id. at 14. "Supply side," in this context, refers to government actors, and "demand side" refers to the regulated industry. Id. at 27.
316. Id. at 36 (explaining that regulators and those “benefiting from the status quo” have little incentive to change it because they “have sunk money and effort” into maintaining it and “are likely to become attached to it”).
317. Buzbee, Recognizing the Regulatory Commons, supra note 6, at 37 (“Regulatory commons dynamics thus create logical incentives for lack of political investment in regulatory solutions.”). While one cure for the regulatory commons is to end the fragmentation by asking agencies to “surrender turf to other agencies,” Buzbee acknowledges that this “would likely meet with staunch resistance.” Id. at 50.
318. Id. at 8.
319. Id. at 9 (saying the absence of a “primary regulator” means that no one is responsible for “transboundary or ecosystem aquaculture risks,” nor is there a single entity “likely to be blamed for [any] harms” that might arise). Buzbee also says regulatory commons problems can occur “outside the setting of commons resource management disputes.” Id. at 7, n.8.
320. Id. at 23.
321. Id. at 9.
322. Id.
regulatory reach of any given institution cannot adequately grapple with what are essentially inter-jurisdictional harms. Here, the inter-jurisdictional harms are escaped fish and widely dispersed pollution. Such regulatory commons also exists where the sheer geographic breadth of the resource, here the oceans, dwarfs the scope of the regulatory mechanism. Finally, a regulatory commons may occur in ocean fish ranching insofar as the "social ill [caused by ocean fish ranching] arises out of dynamics, incentives, or actors outside of a government's jurisdiction." In this case, the industry developed largely in response to "intensified international competition to produce cheap fish" after wild fish stocks "plummeted."

Buzbee posits that crisis conditions may eventually spur "unusual political activism on the part of citizens, politicians, and regulators," leading to changes in the regulatory commons and the emergence of a regulatory response. However, the harms from ocean fish ranching may be sufficiently dispersed and distant to prevent those conditions from arising. Moreover, those harms may most affect those with the least political power to effect a change—impoverished fishing communities. Thus, it seems unlikely that ocean fish ranching will soon emerge from its regulatory commons.

323. Id. (describing the regional or even global "ripple effects" of escaped non-indigenous or bioengineered fish on the marine environment).

324. Id. at 25 (citing oceans and marine resources as an "obvious example of a . . . mismatch" between the size of the regulatory authority and the underlying resource).

325. Id.

326. Id. at 25-26. Even though the international legal framework offered by the Third United Nations Conference on the Law of the Sea, (further developed at the 1992 United Nations Conference on the Environment and Development, which addressed conservation of marine resources and produced the UN Biodiversity Convention, the Rio Declaration on Environment and Development, and Agenda 21), and the 1995 FAO Code of Conduct for Responsible Fisheries, includes "emerging principles" like the precautionary principle, the duty of states to cooperate in mitigating transboundary environmental problems, and the duty to share information, UNCLOS III has done little to address the problems of over-fishing. See Wilson, supra note 36, at 508; see also id. at 508-09 (calling international solutions to over-fishing "imperfect" because they rely on voluntary cooperation and do not incorporate local stakeholders in solutions).

327. Buzbee, Recognizing the Regulatory Commons, supra note 6, at 54; id. at 55 ("[A] combination of external events, political incentives, and changing information and political perceptions can create conditions for enactment of unlikely regulatory schemes").

328. Even Buzbee concedes that unlike urban sprawl and global climate change, where some improbable "collective efforts" have arisen, "aquaculture's fragmented regulation remains unaddressed." Id. at 55-56.
B. Applying the Public Trust Doctrine to the EEZ Makes Good Policy Sense

There are several good policy reasons for applying the public trust doctrine to ocean fish ranching. First, applying the doctrine would eliminate many of the regulatory commons-induced disabilities that afflict the waters of the EEZ. For example, the doctrine could be used to fill existing regulatory gaps, such as preventing the placement of net pens in traditional fishing grounds or requiring that pens be constructed in a way to prevent the escape of farmed fish. The public trust doctrine could also be used to protect trust resources where the problem is not a gap in regulation but conflicting or overlapping regulatory programs. In such a case, the doctrine would not be preempted because there is no comprehensive federal regulatory regime to prevent its use. Since public rights in those resources would be protected, the regulatory commons would vanish until a comprehensive regulatory program could be developed and implemented to supersede the current patchwork of federal and state regulation.

Second, application of the public trust doctrine could impose an obligation on government agencies to scrutinize individual proposals, including those seeking to enclose portions of the EEZ. This would assure that conversion of trust resources serves a public purpose and "do[es] not substantially impair the public interest in the lands and waters remaining." Given the environmental risks associated with ocean fish ranching and its incompatibility with traditional uses of navigable water like fishing,

329. See Babcock, Wetlands and Coastal Barrier Beaches, supra note 217, at 45 n.256 and accompanying text (listing articles exploring potential use of public trust doctrine’s use to protect important natural resources that otherwise might be unprotected). Applying the doctrine of ocean fish ranching is less of a stretch than applying the doctrine to some land-based resources, as has been done in modern times. See id. at 37.

330. See Hildreth, supra note 240, at 230 ("The public trust doctrine’s application further seaward makes possible closer judicial scrutiny of state ocean management activities, and such scrutiny can stimulate legislative and administrative improvements."); Baer, supra note 232, at 433-35 (suggesting using the doctrine as (1) a "rule of construction" that would "construe public land statutes liberally and in favor of public trust beneficiaries"; (2) as part of the "hard look doctrine," resulting in judicial stricter scrutiny and a higher standard of agency performance, and (3) as a "general principle of environmental law," to determine whether the federal government considered both environmental and economic uses of public lands when Congress has directed it to, or more broadly, that it function as a "conceptual framework [within which courts can] exercise judicial review,")

331. Illinois Central Railroad, 146 U.S. at 452.
navigation, and recreation, it may be difficult for an agency to authorize the activity without requiring mitigating preconditions. Agencies might insist that fish ranchers choose facility locations that do not interfere with traditional water uses, or that they compensate individuals or communities who are harmed by side effects such as loss of wild fish stocks. In its strongest incarnation, the doctrine might block the conveyance of trust resources to fish ranchers entirely.

Applying the public trust doctrine to the EEZ makes good policy sense for a third reason. Since the doctrine constrains state police power authority, it acts as a check on potential abuses by the states. For example, while currently a state could readily use its police power to authorize destruction of wildlife or wildlife habitat in the furtherance of general welfare, this would be much more difficult to do under the rigorous standards required by application of the public trust doctrine.

Fourth, applying the doctrine would protect strong national interests in the waters and resources of the EEZ. What the Court said about wild birds in Missouri v. Holland could as easily be said of migratory wild fish:

Here a national interest of very nearly the first magnitude is involved. It can be protected only by national action in concert with that of another power. The subject matter [migratory birds] is only transitorily within the state and has no permanent habitat therein. But for the treaty and the statute there soon might be no birds for any powers to deal with . . . . It is not sufficient to rely upon the States.

Similarly, today wild fish stocks have reached a stage of crisis.

332. See Eichenberg & Vestal, supra note 232, at 372-74 (recommending integration of “broad public trust criteria” into aquaculture leasing laws, including a required finding that the lease “is in the public interest or confers a public benefit,” and that it will not “unreasonably” interfere with riparian access to coastal waters, navigation, or fishing, as well as criteria for setting “priorities among multiple non-aquaculture uses competing with aquaculture applicants for the same site,”).

333. Musiker et al., supra note 224, at 111-12, (discussing the courts’ deference toward state exercise of the police power, and citing Sax, supra note 203, at 478 (judicial review of government action under the public trust doctrine is “more rigorous than that applicable to governmental activity generally”); see also Meyers, Protection of Wildlife, supra note 212, at 735 (“[A]pplication of legal standards that require clear legislative intent before wildlife habitat is alienated, or that require a compelling purpose before those resources can be adversely affected, will lead us to greater degrees of ecosystemic decision making”).

According to Sax, one function of the public trust doctrine is to avoid destabilizing changes that might occur as a result of an environmental crisis, such as the sudden decline of a species.\textsuperscript{335} Here, application of the public trust doctrine is particularly warranted to head off the destabilization that may occur as wild fish stocks decline from the adverse effects of ocean fish ranching.

A fifth advantage of the public trust doctrine is that it would blunt any takings challenges ocean fish ranchers might deploy to block regulation of their activities.\textsuperscript{336} While it is generally agreed that there is no legally cognizable property interest in wild stocks of fish and that fishers who use their boats to fish in the EEZ are “simply . . . enjoying a use of their property that the government cho[o]se[s] not to disturb,”\textsuperscript{337} ocean fish ranchers’ property rights and interests may be different. Fish ranchers may have a property interest in the net pens and other facilities they locate in the EEZ. A court might consider those facilities to be a form of constitutionally protected personal property,\textsuperscript{338} making it difficult for the government to restrict their use once they are set or to order their removal. Additionally, if ocean fish ranchers are seen as cultivators of a crop, not fishers, they may have a property right in the fish themselves, especially if they have stocked those pens with hatchery reared fish. However, under the public trust doctrine, an owner of trust resources can do nothing to alienate them in her favor, as she is no more than a custodian of those resources for the benefit of present and future generations.\textsuperscript{339}

\textsuperscript{335} Joseph L. Sax, Liberating the Public Trust Doctrine from Its Historical Shackles, 14 U.C. DAVIS L. REV. 185, 188-89 (1980).

\textsuperscript{336} See Babcock, Things that Go Bump in the Night, supra note 217, at 892-98.

\textsuperscript{337} Am. Pelagic Fishing Co. 379 F.3d 1363, 1377 (Fed. Cir. 2004); see also Parravano v. Babbitt, 861 F. Supp. 914, 928 (N.D. Cal. 1994) aff’d, 70 F.3d 539 (9th Cir. 1995) (Magnuson Act does not confer on commercial fishermen “any right or title in the fishery resources” under the government’s regulatory authority); see also Britton, supra note 229, at 247 (“Despite the many characteristics of property that ITQs possess, it remains apparent that the rights afforded to ITQ holders exist only as a result of permissive government legislation, which may in the future be revoked like any other ‘privilege.’”)

\textsuperscript{338} Cf. Britton, supra note 229, at 239 (“Courts have regularly acknowledged the compensable nature of leaseholds, both inside and outside of the context of fisheries related leaseholds.”).

\textsuperscript{339} See Boston Waterfront Dev. Corp. v. Commonwealth, 393 N.E.2d 356, 367 (Mass. 1979) (“The land in question is not, like ordinary private land held in fee simple absolute, subject to development at the sole whim of the owner, but is impressed with a public trust, which gives the public’s representatives an interest and responsibility in its development.”); see also Joseph L. Sax, Property Rights and the Economy of Nature: Understanding Lucas v. South Carolina Coastal Council, 45 STAN. L. REV. 1433, 1452 (1993) (suggesting a usufructuary model of property right as an analogue to the concept of
Doctrinally, the right to convert a trust resource to a private use is simply not included in the bundle of ownership sticks she might otherwise possess. Therefore, any governmental restriction on the uses of those resources cannot constitute a taking of private property. Applying these doctrinal principles to ocean fish ranchers means that any ownership interest they might declare in their equipment or the fish themselves, both of which this Article posits are subject to the public trust doctrine, would fall before the dominant public interest in the ocean and fisheries resource and could not block their regulation.

Courts have applied the public trust doctrine to a wide range of resources and activities where statutory regulatory regimes have not been sufficient to protect important public resources. While applying the doctrine to the EEZ has its challenges, the effort to do so is worthwhile, especially if it could displace the regulatory commons that afflicts ocean fish ranching. The potential harms from fish ranching are too great and the public resources of the EEZ too valuable to be left in the limbo created by a patchwork of poorly coordinated regulations.

VI. CONCLUSION

It is a fact, as singular as it was unexpected in the jurisprudence of our state, that the taking [of] a few bushels of oysters . . . should involve in it questions momentous in their nature as well as in their magnitude . . . and embracing, in their investigation, the laws of nations and of England, the relative rights of sovereign and subjects, as well as the municipal regulations of our country.

While there are beneficial aspects to ocean fish ranching, there are also perils. At present, these perils are either unregulated or subject to a cacophony of conflicting and overlapping regulation. This situation creates the unfortunate conditions of a regulatory commons, allowing many of the potential harms of fish ranching...
to go unchecked.

While the thrust of the public trust doctrine suggests that it might be used to protect the natural resources of the EEZ until a coherent regulatory regime develops, it has been unclear whether the doctrine applies so far from shore. This Article suggests that it can apply, either based on the existence of a federal public trust doctrine or on the expansion of state common law to the EEZ. As illustrated by the experience with IFQs, allotting private property rights does not fill this regulatory gap as successfully as applying the public trust doctrine to the resources of the EEZ. Since the environmental and socioeconomic harms of ocean fish ranching are largely external, there is little incentive for the rancher to abate them. Allowing fish ranchers to enclose the ocean for their own commercial purposes will not protect, let alone conserve, the fishery resources of the EEZ, nor will it serve social justice. Private property rights do not account for the public benefit and offer no antidote to the perils of a regulatory commons. Only the public trust doctrine assures proper oversight of ocean fish ranching and consideration of public benefits until a comprehensive regulatory program is developed. Unless the doctrine is applied to the EEZ as an interim measure, the perils associated with ocean fish ranching may continue, and rather than taking pressure off of wild fish stocks, may cause their demise.