

MAINE AQUACULTURE, ATLANTIC SALMON, AND INERTIA: WHAT IS THE FUTURE FOR MAINE'S NET PEN SALMON INDUSTRY?

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Abstract: The Environmental Protection Agency (EPA) has for years failed to create regulations that would govern discharges from aquaculture facilities under the Clean Water Act (CWA). As recent cases from Maine have shown, this failure caused salmon producing aquaculture companies to do very little to reduce the effluent they released directly into the Atlantic. Under the Clean Water Act, however, such polluting is prohibited. Furthermore, under the Endangered Species Act (ESA), additional regulations probably would be imposed on these companies to protect the endangered wild Atlantic salmon that inhabit the rivers and ocean near these facilities. Recent regulations proposed by EPA, however, are probably not stringent enough to meet the statutory requirements of either the CWA or the ESA. While the cleanliness of our waters and the diversity of species should be maintained at the least, these goals can hopefully be reconciled with the growth of an important part of the local and national economy.

INTRODUCTION

On September 12, 2002, the U.S. Environmental Protection Agency (EPA) proposed "effluent limitations guidelines and standards for wastewater discharges from the concentrated aquatic animal production [facility (CAAPF)] industrial point source category."¹ These guidelines would cover both new and existing facilities and would be the first actual technology-based standards promulgated for such facilities.²

While "all point sources other than publicly owned treatment works were to have achieved effluent limitations that require applica-

* Managing Editor, BOSTON COLLEGE ENVIRONMENTAL AFFAIRS LAW REVIEW 2003-04.

¹ Effluent Limitation Guidelines for CAAPFs, 67 Fed. Reg. 57,872, 57,872 (proposed Sept. 12, 2002) (to be codified at 40 C.F.R. pt. 451).

² *Id.*

tion of the 'best practicable control technology' by July 1, 1977,³ no standards regulating effluent from the aquatic animal production industry had even been proposed before the summer of 2002.⁴ EPA contends that in the early 1970s it completed some background work on the issue, but that progress was halted with the 1977 Clean Water Act Amendments and EPA's decision to concentrate on controlling industries where toxic metals and organic chemical compounds were more prevalent.⁵ As EPA's early work with aquatic animal production did not show heavy concentrations of these pollutants, it fell by the wayside.⁶

The absence of effluent guidelines for CAAPFs created problems for aquatic animal production facilities.⁷ EPA's Region One office received requests for National Pollutant Discharge Elimination System (NPDES) permits—which should have been based on the nonexistent guidelines—but issued very few permits due to the lack of standards on which to base them.⁸ A further problem caused by the lack of effluent guidelines is the lack of any national minimum standards with which permit issuers must comply.⁹

Despite this uncertainty in federal regulation, the aquatic animal production industry has grown rapidly: a 1992 study found that \$5.6 billion of the U.S. gross domestic product, along with 181,000 jobs, stemmed from aquaculture.¹⁰ Currently, "there are approximately 4,200 commercial aquatic animal production . . . facilities in the United States."¹¹ These are located in all fifty states, and aquaculture is growing faster than any other form of agriculture in the United States.¹²

³ *Natural Res. Def. Council, Inc. v. Costle*, 568 F.2d 1369, 1373 (D.C. Cir. 1977) (citing 33 U.S.C. § 1311(b)(1)(A) (2000)).

⁴ *Effluent Limitation Guidelines for CAAPFs*, 67 Fed. Reg. at 57,875.

⁵ *Id.*

⁶ *Id.* EPA contends that the earlier work, which created a draft development document for the aquatic animal production industry, did help to guide National Pollution Discharge Elimination System (NPDES) permitting when confronted with a permit application from a CAAPF. *Id.*

⁷ See REBECCA GOLDBURG & TRACY TRIPLETT, ENVTL. DEF. FUND, *MURKY WATERS: ENVIRONMENTAL EFFECTS OF AQUACULTURE IN THE US* 108 (1997), http://www.environmentaldefense.org/documents/490_AQUA.pdf (last visited Apr. 20, 2004).

⁸ *Id.*

⁹ See *id.*

¹⁰ *Id.* at 96.

¹¹ *Effluent Limitation Guidelines for CAAPFs*, 67 Fed. Reg. at 57,876 (citing to the 1998 U.S. Department of Agriculture's Census of Aquaculture).

¹² GOLDBURG & TRIPLETT, *supra* note 7, at 21. "[D]omestic aquaculture production still makes up only 10–15% of the total U.S. seafood supply," however; the rest comes from

EPA believes that many of these facilities already have pollution reduction technology in place even without minimum federal effluent guidelines.¹³ The new restrictions proposed by EPA are intended to go further and would reduce suspended solids released by all types of CAAPFs "by at least 4.1 million pounds per year," leading to a reduction in the "discharge of biochemical oxygen demand (BOD)¹⁴ and nutrients by at least 8.7 million pounds per year."¹⁵ This reduction comes at a relatively low cost.¹⁶ Furthermore, six states have already cited the aquatic animal production industry as a possible cause of poor water quality, and other states have moved to regulate the facilities.¹⁷

In its proposed rule, EPA listed multiple aquaculture production systems, including the net pen and open water systems, which produce salmon in the coastal waters of Maine.¹⁸ Net pen systems generally consist of two nets, one on the interior to keep fish in, while the exterior net serves to keep predators at bay.¹⁹ They are anchored to the sea floor and suspended from the surface with a floatation struc-

wild-caught fish from the United States and imports. *Id.* A more recent study states that the U.S. aquaculture industry is worth about \$1 billion per year; it does not, however, state if it is taking into account as many related aspects of the industry as the above study did. REBECCA J. GOLDBURG ET AL., PEW OCEANS COMM'N, MARINE AQUACULTURE IN THE UNITED STATES: ENVIRONMENTAL IMPACTS AND POLICY OPTIONS, at ii (2001), <http://www.pewoceans.org/reports/137PEWAquacultureF.pdf> (last visited Apr. 20, 2004). Recent concerns with pollutant levels in farmed fish may be slowing this growth, at least with regard to salmon.

¹³ Effluent Limitation Guidelines for CAAPFs, 67 Fed. Reg. at 57,876.

¹⁴ Biological oxygen demand (BOD) is a measure of the concentration of organic material in the water that can be broken down by microorganisms. GOLDBURG & TRIPLETT, *supra* note 7, at 36. A high BOD indicates that the microorganisms would consume most of the oxygen present in the water in breaking down the organic material. *Id.* That consumption of available oxygen then stresses or leads to the death of fish and other organisms that require oxygen. *Id.*

¹⁵ Effluent Limitation Guidelines for CAAPFs, 67 Fed. Reg. at 57,872.

¹⁶ *Id.* ("EPA estimates that compliance with this regulation, as proposed . . . would cost industry an estimated \$1.5 million and Federal and State permitting authorities an estimated \$3,337 on an annual basis.")

¹⁷ *Id.* at 57,876. Illinois, Louisiana, New Hampshire, New Mexico, North Carolina, Ohio, and Virginia see the aquaculture industry as a "potential or contributing source of impairment to water bodies," *Id.* Idaho, Michigan, and Maine are some of the states that "have set water quality based permit requirements for CAAPFs in addition to technology based limits based on" permit writers' best professional judgment. *Id.* While this Note focuses on aquaculture in Maine, state regulation will not feature prominently in the discussion.

¹⁸ *Id.* at 57,878.

¹⁹ *Id.*

ture; the netting continues above the water to a degree to stop fish from jumping out.²⁰

Because of their location in open water, net pens contribute to pollution.²¹ They

take advantage of an existing water body's circulation to wash away wastes and bring fresh water to the animals. Presently, the most common species raised in open water systems are molluscan shellfish . . . and salmon that are grown to market size in net pens. . . . There is considerable interest and research being conducted to raise additional species of fish in net pen systems.²²

EPA's concerns of feed, diseases, and non-native species arising from net pen aquaculture tend to fall outside of what would be considered traditional pollutants.²³ The amount of feed administered is a substantial issue, as open water facilities do not have a chance to treat or remove it before discharge.²⁴ Diseases are a concern due to the possibility of infecting local populations, drug treatment and its possible effects through eventual human consumption, and the difficulty of controlling drugs once they are placed in the receiving waters.²⁵ Finally, non-native species pose the threat of becoming an invasive species that could out-compete local species or introduce new diseases with which native species are unable to contend.²⁶

In 2000, the above concerns were magnified when the wild species of Atlantic salmon that inhabited eight of Maine's rivers and other waters was listed as endangered.²⁷ A dramatic reduction in the numbers of wild Atlantic salmon in Maine's waters led to the listing; diseases spread from farmed salmon, combined with increased competition and genetic dilution from net pen escapees, could harm the remaining, endangered Atlantic salmon.²⁸

²⁰ *Id.* at 57,878–79.

²¹ Effluent Limitation Guidelines for CAAPFs, 67 Fed. Reg. at 57,878.

²² *Id.*

²³ *Id.* at 57,879.

²⁴ *Id.* But, as “[f]eed is the most expensive production input for most CAAP facilities . . . operators have a financial incentive to minimize excess feed, independent of concerns about water quality.” *Id.*

²⁵ *Id.* Only six drugs are currently approved by the FDA for CAAPF use. *Id.*

²⁶ *Id.* There is national oversight of the introduction of non-native species, and some states conduct similar monitoring. *Id.*

²⁷ 50 C.F.R. § 17.11 (2002); Final Endangered Status for Anadromous Atlantic Salmon, 65 Fed. Reg. 69,459, 69,464 (Nov. 17, 2000) (codified at 50 C.F.R. pt. 17.11 (h)).

²⁸ Final Endangered Status for Anadromous Atlantic Salmon, 65 Fed. Reg. at 69,464.

This Note contends that as currently operating, net pen facilities in Maine are in violation of both the Federal Water Pollution Control Act (Clean Water Act or CWA) and the Endangered Species Act (ESA).²⁹ Furthermore, this Note argues that the recent, proposed CWA federal effluent guidelines briefly set forth above would serve not only as an extremely low baseline for state regulation, but would also contravene the purposes of the CWA while stifling implementation of the ESA as applied to the endangered, wild Atlantic salmon.

Part I examines the background of this problem and the cases that inspired this Note. Part II deals with the application of the CWA to the current situation in Maine. Part III expands the CWA analysis on which the cases were based and examines the extra layer of regulation and protection of endangered Atlantic salmon that should be added through the application of the ESA. Part IV argues that the proposed standards do not accomplish the purposes of either the CWA or the ESA. The conclusion argues that in order to accomplish the relevant statutory purposes, Maine's permitting procedures must be more stringent than the proposed federal guidelines.

I. ATLANTIC SALMON, STOLT SEA FARM, AND THE HISTORIC LACK OF FEDERAL REGULATION OF MARINE AQUACULTURE

On June 17, 2002, the U.S. District Court of Maine entered orders holding that two salmon net pen facilities were point sources and were required to obtain NPDES permits under the CWA.³⁰ This decision was preceded by more than a decade of uncertainty and agency inaction.³¹

²⁹ Other potentially applicable federal laws not discussed in this Note are the Rivers and Harbors Appropriation Act of 1899, the Ocean Dumping Act, the Magnuson Fishery Conservation and Management Act, and the Coastal Zone Management Act, among others. See GOLDBURG ET AL., *supra* note 12, at 21; D. Douglas Hopkins et al., *Open Ocean Aquaculture: An Environmental Critique of Government Regulations and Policies for Open Ocean Aquaculture*, 2 OCEAN & COASTAL L.J. 235, 240-53 (1997); Melissa Schatzberg, Note, *Salmon Aquaculture in Federal Waters: Shaping Offshore Aquaculture Through the Coastal Zone Management Act*, 55 STAN. L. REV. 249, 257-60 (2002).

³⁰ U.S. Pub. Interest Research Group v. Atl. Salmon of Me., LLC, 215 F. Supp. 2d 239, 241 (D. Me. 2002) [*Salmon I*]; U.S. Pub. Interest Research Group v. Stolt Sea Farm, Inc., No. CIV.00-1490B0C, 2002 WL 1552165, at *1 (D. Me. June 17, 2002) (order affirming recommended decision of magistrate judge).

³¹ *Salmon I*, 215 F. Supp. 2d at 244-45; U.S. Pub. Interest Research Group v. Stolt Sea Farm, Inc., No. CIV.00-149-B-C, 2002 WL 240386, at *4 (D. Me. Feb. 19, 2002) (recommended decision of magistrate judge).

In 1987, Atlantic Salmon of Maine (Atlantic) and Stolt Sea Farm (Stolt) began their salmon net pen facilities off the coast of Maine.³² Both operations claim that at that point, EPA did not require them to have permits for their activities.³³ In a July 19, 1989 letter from EPA Region One to the Army Corps of Engineers, however, William Lawless, Director of Water Management Division, stated that “[u]pon re-evaluating the regulations, we have determined that some of these concentrated aquatic animal production facilities may require a permit under the National Pollutant Discharge Elimination System (NPDES) program.”³⁴ EPA reiterated this position in an August 1989 response to a letter of intent to sue EPA for not requiring the salmon farming facilities to have NPDES permits.³⁵

It was not until over a year later, in October 1990, that EPA notified Atlantic and Stolt that they were required to have NPDES permits.³⁶ Both companies responded relatively quickly and submitted NPDES permit applications, but EPA never replied or issued permits.³⁷ In the intervening years, both Atlantic and Stolt contacted federal and state bodies for assurances that their business operations could continue without NPDES permits, but both were rebuffed.³⁸ In the fall of 2000, the United States Public Interest Research Group (USPIRG) sued to enjoin production at Atlantic, Stolt, and a third facility for violations of the Clean Water Act—specifically, for discharges from a point source without a NPDES permit.³⁹

³² *Salmon I*, 215 F. Supp. 2d at 260; *Stolt Sea Farm*, 2002 WL 240386, at *16.

³³ *Salmon I*, 215 F. Supp. 2d at 260; *Stolt Sea Farm*, 2002 WL 240386, at *16.

³⁴ *Salmon I*, 215 F. Supp. 2d at 244 (quoting letter).

³⁵ *Id.* at 244–45.

³⁶ *Salmon I*, 215 F. Supp. 2d at 245; *Stolt Sea Farm*, 2002 WL 240386, at *4.

³⁷ *Salmon I*, 215 F. Supp. 2d at 245; *Stolt Sea Farm*, 2002 WL 240386, at *4.

³⁸ Atlantic contacted EPA in 1993 in this regard but received no response. *Salmon I*, 215 F. Supp. 2d at 245. Stolt and the Maine Department of Marine Resources had the following confused correspondence in 1992: Stolt complied with the Department of Marine Resources’s request and stated that they “intend[] to be covered by and will comply with the terms of the general NPDES permit for offshore net pen facilities in the State of Maine,” but no such permit existed and, moreover Maine had no role in NPDES permit distribution until control was transferred from EPA in January 2001. *Stolt Sea Farm*, 2002 WL 240386, at *4 (quoting Stolt’s letter); see 33 U.S.C. § 1342(b) (2000) (detailing the procedure and requirements by which states may administer the NPDES permit program).

³⁹ *Salmon I*, 215 F. Supp. 2d at 245 n.11; *Stolt Sea Farm*, 2002 WL 240386, at *10 n.10. The third facility was Heritage Salmon, which settled with USPIRG before trial. Consent Decree and Order, U.S. Pub. Interest Research Group v. Heritage Salmon, Inc., (D. Me. 2002) (No. 00-150B-C); U.S. PUB. INTEREST RESEARCH GROUP, SETTLEMENT OF ENVIRONMENTAL LAWSUIT POINTS TO NEW DIRECTION FOR SALMON FARMING (2002), <http://uspirg.org/uspirgnewsroom.asp?id2=7087&id3=USPIRGnewsroom> (last visited Apr. 20, 2004). The terms of the settlement included: (1) a ban on European

The number of operations developed by Atlantic and Stolt since 1987 is significant: Atlantic owns and operates five salmon net pen facilities in Maine's Machias Bay, two in Pleasant Bay, and it owns others; Stolt owns five net pen facilities in Cobscook Bay, two of which operate under a different name.⁴⁰ To give some idea of the scale of production involved, Atlantic states that "[o]n any given day, there are 2.3 million salmon in ASM [Atlantic Salmon of Maine]'s pens."⁴¹ Each of Stolt's net pen facilities can have up to twenty-eight pens, with 5000 to 16,000 salmon in each, allowing for a stock potentially equal to Atlantic's.⁴²

II. THE APPLICATION OF THE CLEAN WATER ACT IN THE ABSENCE OF PERMITS AND STANDARDS

In passing the CWA, Congress set out as its goal "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters,"⁴³ and recognized that states play a large role in

and genetically modified salmon; (2) an agreement to take strong measures against fish escapes; (3) compliance with federal fish-marking requirements; (4) fallowing of net pen sites to reduce disease and cumulative pollution impacts; (5) a ban on experimental drug use without review; and (6) a moratorium on expansion into Penobscot Bay. U.S. PUB. INTEREST RESEARCH GROUP, SETTLEMENT OF ENVIRONMENTAL LAWSUIT POINTS TO NEW DIRECTION FOR SALMON FARMING (2002), <http://uspirg.org/uspirgnewsroom.asp?id2=7087&id3=USPIRGnewsroom&> (last visited Apr. 20, 2004). Part of Heritage's impetus to settle reportedly stemmed from the fact that they had not put the same effort into obtaining permits that Atlantic and Stolt had, albeit unsuccessfully, and thus did not view its chances at trial as good. Interview with David A. Nicholas, Senior Attorney, and Joseph J. Mann, Staff Attorney, National Environmental Law Center, in Boston, Mass. (Apr. 18, 2003) [hereinafter Interview]. Heritage may have been wiser than the other companies sued, however, as the magistrate judge's recommended decision for Heritage tracked those submitted for Atlantic and Stolt almost word for word. *Compare* U.S. Pub. Interest Research Group v. Heritage Salmon, Inc., No. CIV.00-150-B-C, 2002 WL 240440 *passim* (D. Me. Feb. 19, 2002) (recommended decision of magistrate judge), *with* *Salmon I*, 215 F. Supp. 2d 239 *passim*, and *Stolt Sea Farm*, 2002 WL 240386 *passim*. The magistrate's recommendation for Stolt was affirmed, while the recommendation for Atlantic appears to have been appended verbatim to the trial judge's decision. *Stolt Sea Farm*, 2002 WL 1552165, at *1. *Compare* *Salmon I*, 215 F. Supp. 2d *passim*, *with* *Stolt Sea Farm*, 2002 WL 240386 *passim*. Whether Heritage chose the wiser option is an undercurrent in this Note.

⁴⁰ *Salmon I*, 215 F. Supp. 2d at 242; *Stolt Sea Farm*, 2002 WL 240386, at *1.

⁴¹ ATL. SALMON OF ME., SALMON FARMING AND THE ENVIRONMENT: ENVIRONMENTAL IMPACT FACT SHEET, at http://www.majesticSalmon.com/facts_ei.html (last visited Apr. 20, 2004).

⁴² *Stolt Sea Farm*, 2002 WL 240386, at *2.

⁴³ 33 U.S.C. § 1251(a) (2000).

certain terms in this definition suggest a broad reading of the term pollutant, others do not.⁵⁴ The courts appear to disagree as to the breadth of the definition.⁵⁵ In *National Wildlife Federation v. Gorsuch*, the District of Columbia Circuit stated that:

the wording of § [1362(6)] makes us cautious in adding new terms to the definition. Congress used restrictive phrasing— “[t]he term ‘pollutant’ means dredged soil, [etc.]”—rather than the looser phrase “includes,” used elsewhere in the Act. As a general rule, “[a] definition which declares what a term “means” . . . excludes any meaning that is not stated.”⁵⁶

Furthermore, the court looked to the legislative history of the CWA and determined that while drafting the definition of pollutant, both the House and the Senate ultimately left out more encompassing language that they had contemplated.⁵⁷

A slightly different result was reached in *Sierra Club, Lone Star Chapter v. Cedar Point Oil Co.*, where the Fifth Circuit stated that “[w]e do not disagree with the D.C. Circuit’s assessment that the use of the word ‘means’ manifests an intent to restrict the definition of pollutant to the terms listed.”⁵⁸ By way of contrast, however, the Fifth Circuit determined that “the breadth of many of the items in the list of ‘pollutants’ tends to eviscerate any restrictive effect.”⁵⁹ After offering a different perspective on the relevant legislative history, the Fifth Circuit determined that a substance can be covered by the definition of pollutant even if not specifically listed, and that the courts have the power to decide whether a discharged substance is a pollutant.⁶⁰

In determining what materials from Atlantic and Stolt fall under the CWA’s definition of pollutant, the District Court of Maine relied

⁵⁴ See *id.* (compare the terms “biological materials” and “cellar dirt”).

⁵⁵ Compare *Sierra Club, Lone Star Chapter v. Cedar Point Oil Co.*, 73 F.3d 546, 565–67 (5th Cir. 1996), with *Gorsuch*, 693 F.2d at 171–73.

⁵⁶ *Gorsuch*, 693 F.2d at 171–72 (quoting *Colautti v. Franklin*, 439 U.S. 379, 392 n.10 (1979) (quoting C. SANDS, STATUTES AND STATUTORY CONSTRUCTION § 47.07 (4th ed. Supp. 1978))).

⁵⁷ *Id.* at 173.

⁵⁸ *Cedar Point Oil*, 73 F.3d at 565.

⁵⁹ *Id.* The Fifth Circuit intimates that the *Gorsuch* court recognized this conclusion; however, the footnote that it cites merely states the court’s difficulty in squaring the definition in the CWA with the legislative history. See *id.*; *Gorsuch*, 693 F.2d at 173 n.52.

⁶⁰ *Cedar Point Oil*, 73 F.3d at 566–67. To be fair, the Fifth Circuit did point out a significant difference between *Cedar Point Oil Co.* and *Gorsuch*—in the latter, the D.C. Circuit was “reviewing a decision by EPA not to regulate” certain substances through a permit. *Id.* at 567 (emphasis added).

B. Added . . .

As stated by the Second Circuit, “[t]he EPA’s position, upheld by the *Gorsuch* and *Consumers Power* courts, is that for there to be an ‘addition,’ a ‘point source must *introduce* the pollutant into navigable water from the outside world.’”⁶⁷ All of the materials listed above as pollutants were considered to be added as they do not naturally occur in the bays where the net pens are located.⁶⁸

C. To Navigable Waters . . .

Under the CWA, navigable waters are defined as “the waters of the United States, including the territorial seas.”⁶⁹ A territorial sea is “the belt of the seas measured from the line of ordinary low water along that portion of the coast which is in direct contact with the open sea and the line marking the seaward limit of inland waters, and extending seaward a distance of three miles.”⁷⁰ As Atlantic’s and Stolt’s net pen farms are in Maine’s Cobscook, Machias, and Pleasant Bays, they fall well within the definition of navigable waters.⁷¹

D. From . . .

Neither Atlantic nor Stolt disputed that any of the material determined to be a pollutant above came from its farms.⁷²

⁶⁷ *Catskill Mountains Chapter of Trout Unlimited v. City of New York*, 273 F.3d 481, 491 (2d Cir. 2001) (quoting *Nat’l Wildlife Fed’n v. Gorsuch*, 693 F.2d 156, 165, 175 (D.C. Cir. 1982), which held that EPA probably has the discretion to define the term “addition,” and following that definition, determined that low-oxygen, super-saturated, and cold water flowing from one side of a dam to another does not constitute an addition (citing *Nat’l Wildlife Fed’n v. Consumers Power Co.*, 862 F.2d 580, 585 (6th Cir. 1988), which held that an electric generating plant on Lake Michigan did not add dead fish to the water, but merely changed live fish to “a mixture of live and dead fish in the process of generating electricity” and that under the CWA “live fish would be just as much a pollutant as a mixture of live and dead fish” as both are biological materials)).

⁶⁸ *Salmon I*, 215 F. Supp. 2d at 248 (listing a possible exception for the feed used by Atlantic, as the court considered the possibility that if the fish material came from where the pens were located, it would not technically be an addition); *Stolt Sea Farm*, 2002 WL 240386, at *7.

⁶⁹ 33 U.S.C. § 1362(7) (2000).

⁷⁰ *Id.* § 1362(8).

⁷¹ *Salmon I*, 215 F. Supp. 2d at 249; *Stolt Sea Farm*, 2002 WL 240386, at *8.

⁷² *Salmon I*, 215 F. Supp. 2d at 249; *Stolt Sea Farm*, 2002 WL 240386, at *8.

Even if a facility would be considered only an AAPF under the definition above, the EPA Director could still designate it as a CAAPF "upon determining that it is a significant contributor of pollution to the waters of the United States."⁷⁹ Factors for the Director to consider before making such a determination are the "location and quality of the receiving waters . . . [t]he holding, feeding, and production capabilities of the facility; [t]he quantity and nature of the pollutants . . . and [o]ther relevant factors."⁸⁰ Nonpoint sources, such as AAPFs, do not require NPDES permits.⁸¹

While neither Atlantic nor Stolt were designated as CAAPFs under the Director's discretionary power, USPIRG alleged that they were CAAPFs as defined in the regulations.⁸² Atlantic and Stolt admitted that each of its net pen facilities produces at least 9090 harvest weight kilograms per year.⁸³ Both also admitted that they fed the salmon at each site at least 2272 kilograms of food during the calendar month of maximum feeding.⁸⁴ Neither company disputed that it raised cold water fish, or that it was discharging at the rate defined in the regulations.⁸⁵

Atlantic and Stolt did contest the applicability of the definition of point source to their net pen facilities, based on the argument that they did not use "ponds, raceways, or other similar structures."⁸⁶ They construed the above terms to imply that the facilities had to be in

but are not limited to, the Salmonidae family of fish; e.g., trout and salmon." *Id.* Thus, Atlantic and Stolt fall into the cold water fish section. *See id.*

⁷⁹ *Id.* § 122.24(c).

⁸⁰ *Id.* § 122.24(c)(1)(i)-(iv). While a designation under § 122.24(c) could possibly be surprising for the facility on the receiving end, the regulation slightly softens the blow by stating that a NPDES permit application is not required under this section "until the Director has conducted on-site inspection of the facility and has determined that the facility should and could be regulated under the permit program." *Id.* § 122.24(c)(2).

⁸¹ *See id.* § 122.3(e).

⁸² *Salmon I*, 215 F. Supp. 2d at 251; *Stolt Sea Farm*, 2002 WL 240386, at *10; *see* 40 C.F.R. § 122 app. C.

⁸³ *Salmon I*, 215 F. Supp. 2d at 243 (excepting one of Atlantic's sites); *Stolt Sea Farm*, 2002 WL 240386, at *2; *see* 40 C.F.R. § 122 app. C.

⁸⁴ *Salmon I*, 215 F. Supp. 2d at 243 (excepting one of Atlantic's sites); *Stolt Sea Farm*, 2002 WL 240386, at *2; *see* 40 C.F.R. § 122 app. C.

⁸⁵ *See Salmon I*, 215 F. Supp. 2d at 244, 251; *Stolt Sea Farm*, 2002 WL 240386, at *3, 10; 40 C.F.R. § 122 app. C (setting the discharge rate to at least thirty days per year).

⁸⁶ *Salmon I*, 215 F. Supp. 2d at 251; *Stolt Sea Farm*, 2002 WL 240386, at *10; *see* 40 C.F.R. § 122(a) app. C. They also incorporated an argument that contended that their facilities could not be point sources as they did not have a "discrete, confined and direct conveyance" or "discrete discharge pipes." *Salmon I*, 215 F. Supp. 2d at 251; *Stolt Sea Farm*, 2002 WL 240386, at *10.

posed NPDES discharge standards; and (4) the discharges were minimal.¹⁰³

In holding the exception inapplicable to Atlantic and Stolt, the court covered old ground, stating that “[s]ince 1979, the EPA has had a permit procedure for CAAPFs in place.”¹⁰⁴ The court was unconcerned that both defendants apparently followed the permitting procedures and applied for NPDES permits, and that EPA did not react.¹⁰⁵ The court found nothing to demonstrate that EPA could not have issued a permit, and held that EPA’s administrative failure to issue a permit does not allow the defendants to violate the zero-discharge standard.¹⁰⁶ Also, unlike in *Hughey*, a zero-discharge level could be achieved.¹⁰⁷ Here, Atlantic and Stolt could simply cease operations and end the discharges.¹⁰⁸

G. Clean Water Act Outcome

Thus, because Atlantic and Stolt were discharging pollutants without a NPDES permit, they were in violation of the CWA.¹⁰⁹ Based on this violation, both Atlantic and Stolt were instructed to: (1) each pay \$50,000; (2) “scrupulously follow and strictly comply with all existing regulatory requirements” regarding net pens currently stocked with fish; (3) finish harvesting fish currently in the water as soon as

¹⁰³ *Id.* at 1530.

¹⁰⁴ *Salmon I*, 215 F. Supp. 2d at 257; *Stolt Sea Farm*, 2002 WL 240386, at *14 (citing 40 C.F.R. § 122.24; Revision of NPDES Regulations, 44 Fed. Reg. 32,854, 32,870 (June 7, 1979) (codified at 40 C.F.R. pt. 122.43) (“requiring permits for CAAPFs and allowing case-by-case determination for AAPFs”).

¹⁰⁵ *Salmon I*, 215 F. Supp. 2d at 257; *Stolt Sea Farm*, 2002 WL 240386, at *14. While not cited by the District Court of Maine, a NPDES permit was granted to a potential net pen facility in Acadia, Maine. LINDA M. MURPHY, ENVTL. PROT. AGENCY, PERMIT NO. ME0036234, AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (2002) (on file with author).

¹⁰⁶ *Salmon I*, 215 F. Supp. 2d at 257; *Stolt Sea Farm*, 2002 WL 240386, at *14; see *Bear-tooth Alliance v. Crown Butte Mines*, 904 F. Supp. 1168, 1174 (D. Mont. 1995) (“To be in compliance with the CWA, it is necessary to not only apply for, but also to have a permit.”).

¹⁰⁷ *Salmon I*, 215 F. Supp. 2d at 258; *Stolt Sea Farm*, 2002 WL 240386, at *14. As *Hughey* dealt with storm water, the Eleventh Circuit stated: “[p]ractically speaking, rain water will run downhill, and not even a law passed by the Congress of the United States can stop that.” *Hughey*, 78 F.3d at 1530.

¹⁰⁸ *Salmon I*, 215 F. Supp. 2d at 258; *Stolt Sea Farm*, 2002 WL 240386, at *14; see *Hughey*, 78 F.3d at 1530 (“This was not a case of a manufacturing facility that could abate the discharge of pollutants by ceasing operations.”).

¹⁰⁹ *Salmon I*, 215 F. Supp. 2d at 241; U.S. Pub. Interest Research Group v. *Stolt Sea Farm, Inc.*, No. CIV.00-1490B0C, 2002 WL 1552165, at *1 (D. Me. June 17, 2002).

scientific and commercial data available," following a review of the species's status, and an inquiry into conservation efforts undertaken by local, state, or foreign governments.¹¹⁶

Once a species is listed as endangered, it is "unlawful for any person . . . to . . . take any such species."¹¹⁷ "Take" is broadly defined under the ESA, as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."¹¹⁸ To ensure the broad application of the ESA, "person" is defined in breadth equal to "take."¹¹⁹ The ESA also requires cooperation with the states to the extent practicable in conserving species.¹²⁰

The background of the debate over the listing of Atlantic salmon as an endangered species has been widely covered.¹²¹ In 1991, the U.S. Fish and Wildlife Service (FWS) named the Atlantic salmon in Maine rivers as a candidate species under the ESA.¹²² While deciding that Atlantic salmon throughout the United States did not require listing as an endangered species, by 1995 the FWS determined that those in Maine were "a distinct population segment,"¹²³ eligible for protection under the ESA and in danger of extinction.¹²⁴

Maine, in order to keep greater control at the state level, responded to an option in the proposed listing and put forth a conser-

¹¹⁶ 16 U.S.C. § 1533(b)(1)(A).

¹¹⁷ *Id.* § 1538(a)(1)(B) (listing many other prohibited acts, such as importing, possessing, selling, and delivering).

¹¹⁸ *Id.* § 1532(19). While the definition of "take" is broad, "harm" extends further, because it "means an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering." 50 C.F.R. § 17.3 (2002). This definition has been upheld as quite broad and a reasonable construction of congressional intent. *Babbitt v. Sweet Home Chapter of Cmty. for a Great Or.*, 515 U.S. 687, 708 (1995).

¹¹⁹ 16 U.S.C. § 1532(13) (defining "person" as "an individual, corporation, partnership, trust, association, or any other private entity," and encompassing all levels of government in a similar manner).

¹²⁰ *Id.* § 1535(a).

¹²¹ *Maine v. U.S. Dep't of the Interior*, 298 F.3d 60, 63 (1st Cir. 2002); *Maine v. Norton*, 203 F.R.D. 22, 25 (D. Me. 2001), *aff'd*, 262 F.3d 13 (1st Cir. 2001); Final Endangered Status for Anadromous Atlantic Salmon, 65 Fed. Reg. 69,459, 69,462 (Nov. 17, 2000) (codified at 50 C.F.R. pt. 17.11(h)).

¹²² *Maine*, 298 F.3d at 63.

¹²³ *Id.* The term species is defined in the Endangered Species Act (ESA) as including "any subspecies of fish or wildlife or plants, and any distinct population segment [DPS] of any species of vertebrate fish or wildlife which interbreeds when mature." 16 U.S.C. § 1532(16). Thus, the entire species of Atlantic salmon need not be listed for those in designated areas of Maine to be protected. *See id.*; Final Endangered Status for Anadromous Atlantic Salmon, 65 Fed. Reg. at 69,459.

¹²⁴ *Maine*, 298 F.3d at 63.

ture practices, low juvenile in-river survival levels, continuing decline in adult returns, and the lack of sufficient progress in dealing with sport fishing (at that time) and water withdrawals.¹³³ The first three factors relate directly to the CAAPFs in Maine.¹³⁴

A. *The Possibilities of Disease*

The primary disease that is a potential threat to Atlantic salmon is known as the infectious salmon anemia (ISA) virus.¹³⁵ The ISA virus is presently without a cure and is "extremely destructive to maturing salmon."¹³⁶ Previously, the virus was only "known to cause disease in situations where fish were artificially confined." Recently, however, it has been found in wild salmon and other wild fish.¹³⁷

At the time of the writing of the final rule, the ISA virus had infected salmon in Canadian net pen facilities.¹³⁸ The Canadian facilities were deemed "close enough to U.S. aquaculture sites in Cobscook Bay, the location of Maine's greatest concentration of salmon aquaculture pens, to create a significant risk of the introduction of the virus to U.S. aquaculture stocks."¹³⁹ At this point, the only wild fish that had been infected were those exposed to the infected Canadian facilities.¹⁴⁰ Despite that, the potential magnifying effect of high concentrations of fish—such as those in net pens—on the virus was viewed as a serious risk to the Atlantic salmon located nearby.¹⁴¹ The FWS felt that Maine's regulations "may not fully ensure testing, reporting, and depopulation of diseased fish," making possible the spread of the ISA virus from salmon in net pen facilities to Atlantic salmon.¹⁴²

The fears expressed in the Federal Register were justified.¹⁴³ In 2001, an outbreak of the ISA virus in Cobscook Bay forced operators

¹³³ *Id.*

¹³⁴ *See id.*

¹³⁵ *Id.* at 69,464, 69,469. Another virus of concern for wild and farmed salmon is salmon swimbladder sarcoma virus (SSSV). *Id.* at 69,461.

¹³⁶ *Id.* at 69,469.

¹³⁷ *Id.* ISA has been found in wild fish in Canada, Norway, and Scotland. *Id.*; GOLDBURG ET AL., *supra* note 12, at 9.

¹³⁸ Final Endangered Status for Anadromous Atlantic Salmon, 65 Fed. Reg. at 69,469.

¹³⁹ *Id.* The ISA virus is known to be "transmissible laterally between fish pens within 5 kilometers (km) of each other, and by the discharge of slaughter wastes." *Id.*

¹⁴⁰ *Id.*

¹⁴¹ *Id.*

¹⁴² *Id.* at 69,477.

¹⁴³ *See id.* at 69,469; Bridget M. Kuehn, *Officials Fine-tune Salmon Virus Response*, J. AM. VETERINARY MED. ASS'N, July 1, 2002, <http://www.avma.org/onlnews/javma/jul02/020701e.asp> (last visited Apr. 20, 2004).

guidelines, Maine's permitting authority is not supreme, as EPA can object to permits issued and, if the problem is not fixed, reassume its role as the issuer of permits.²¹²

It would seem that if the Maine Department of Environmental Protection (DEP) issued a permit for Atlantic's discharges, and EPA did not object, an injunction against Atlantic would likely be moot.²¹³ The District Court of Maine and the First Circuit did not agree with this assessment.²¹⁴ Surprisingly, the First Circuit upheld the injunctive relief granted by the district court, despite the fact that it was more stringent than the permit issued by the DEP.²¹⁵

If enforcement of the CWA in Maine was still under federal authority, and the proposed regulations were final, it is very likely that Atlantic would be in compliance.²¹⁶ Atlantic already monitors feeding by video cameras, and stops or adjusts feeding when uneaten pellets are viewed.²¹⁷ Also, Stolt and Atlantic were both part of a monitoring program headed by the Maine Department of Marine Resources, with which EPA was involved.²¹⁸

The DEP has developed a "general permit that could cover many of the State's existing and new aquaculture facilities to bring them into compliance with federal statutes."²¹⁹ This permit, even if it followed proposed regulations described above, would not be in line with the intent of the CWA, because the large disposal of pollutants by

Pollutant Discharge Elimination System Under CWA, 66 Fed. Reg. 12,791, 12,792 (Feb. 28, 2001) (calling the Maine issued permits MEPDES permits).

²¹² Final Approval of the Maine Pollutant Discharge Elimination System Under CWA, 66 Fed. Reg. at 12,792.

²¹³ See 33 U.S.C. §§ 1311(a), 1342(b) (2000).

²¹⁴ *Salmon III*, 257 F. Supp. 2d 407 (D. Me.), *aff'd*, 339 F.3d 23 (1st Cir. 2003).

²¹⁵ *Salmon IV*, 339 F.3d at 35; see discussion *supra* Part II.G. The First Circuit held that as "the companies have violated the statute . . . nothing in the shield provision's language directly addresses the question whether and when in such a situation the district court's authority gives way to the agency's." *Salmon IV*, 339 F.3d at 31. As the district court's injunction was issued before the general permit, remedied harm for past violations, and did not reduce the environmental protection provided by the permit, the injunctive relief could stand despite the conflicts between the general permit and the injunctive relief. *Id.*

²¹⁶ Effluent Limitation Guidelines for CAAPFs, 67 Fed. Reg. 57,872, 57,889, 57,900 (proposed Sept. 12, 2002) (to be codified at 40 C.F.R. pt. 451).

²¹⁷ ATL. SALMON OF ME., *supra* note 178. Stolt may also operate in a similar manner, however, information as to its feeding practices was limited to descriptions in the available caselaw.

²¹⁸ *Salmon I*, 215 F. Supp. 2d 239, 260 n.24 (D. Me. 2002); U.S. Public Interest Research Group v. Stolt Sea Farm, Inc., No. CIV.00-149-B-C, 2002 WL 240386, at *16 n.23 (D. Me. Feb. 19, 2002).

²¹⁹ NORMANDEAU ASSOCS. & BATTELLE, *supra* note 187, at 3.

net pen facilities allowed by this permit is contrary to the vision of restoring and maintaining the integrity of waters of the U.S.²²⁰

A study conducted to demonstrate the amount of nitrogen, phosphorus, and biological oxygen demand (or sewage) created by a salmon net pen facility proves this point.²²¹ In this study, the director of the University of Idaho's Hagerman Fish Culture Experiment Station determined that a fish farm of 200,000 salmon would produce an amount of nitrogen, phosphorus, and biological oxygen demand (or fecal matter) equal to that produced by 15,000, 26,667, and 62,505 people, respectively, per day.²²² This "nutrient loading" stems from organic wastes that "may include uneaten food, feces, urine, mucus, and dead fish."²²³

"[C]urrently there are 26 active pen sites and 45 permitted pen sites, and on average, the number of fish per site is 350,000."²²⁴ Judging by those numbers, Maine had approximately 9.1 million salmon in its marine net pen sites.²²⁵ Based on the above calculation for salmon waste, 9.1 million fish would yield a release of: nitrogen equal to the untreated sewage of 682,500 people; phosphorus equal to the untreated sewage of more than 1.2 million people; and fecal matter equal to the untreated sewage of over 2.8 million people.²²⁶

²²⁰ See 33 U.S.C. § 1251(a) (2000). This is assuming that the option of no regulation is not selected; the no regulation option would, obviously, follow the CWA's intent to an even lesser degree. See *id.*

²²¹ Ronald W. Hardy, *Fish Feeds and Nutrition—Urban Legends and Fish Nutrition*, AQUACULTURE MAG., Nov.–Dec. 2000, at 47, 47–50, <http://www.aquaculturemag.com/siteenglish/printed/archives/issues00/00articles/ND2000Urban.pdf> (last visited Apr. 20, 2004). This article was actually written to argue against the "urban legend" that a *single* salmon farm produces "the same amount of sewage, meaning nitrogen, phosphorus, and biological oxygen demand" as 1.5 million people. *Id.* (emphasis added). For the source of this "urban legend," see GOLDBURG & TRIPLETT, *supra* note 7, at 38. These authors actually state that "[d]ischarges from the many salmon farms along the coast of British Columbia are a significant pollution source, estimated to be equivalent to raw human sewage from a city of 500,000 people." *Id.* (emphasis added).

²²² Hardy, *supra* note 223, at 48–50. The amount of nitrogen was actually calculated to be equivalent to that produced by 19,800 people per day, but was rounded down to exclude other sources of nitrogen. *Id.*

²²³ GOLDBURG ET AL., *supra* note 12, at 13. The District Court of Maine termed fish, feces, urine, feed, and other matters leaving the net pens and entering the waters pollutants. *Salmon I*, 215 F. Supp. 2d at 247–48; *Stolt Sea Farm*, 2002 WL 240386, at *6–7.

²²⁴ Indemnity for Infectious Salmon Anemia, 67 Fed. Reg. 17,605, 17,608 (proposed Apr. 11, 2002) (interim rule). This was the most recent, and the highest, estimate for the number of salmon in Maine. See *id.*

²²⁵ See *id.*

²²⁶ See *id.*; Hardy, *supra* note 223, at 48–50. This calculation assumes that the sewage released by salmon increases at a consistent rate corresponding with the increasing number of salmon, e.g., a farm of 400,000 salmon would release double the amounts of nitrogen,

These numbers are quite staggering, especially when compared to Maine's 2001 population of less than 1.3 million people.²²⁷ The numbers are also deceiving, because nearly all of Maine's salmon farms are nestled in Washington and Hancock counties at the eastern end of the state.²²⁸ The total population of these two counties was estimated to be 85,909 in 2001.²²⁹ Based on these statistics, Washington and Hancock counties could dispose all of their human waste directly into the sea and it would be a small addition to the waste currently being disposed in these counties by net pen facilities without any treatment.²³⁰ Monitoring excess feed alone, even "actively," does not seem to be enough.

B. *A Potential Lack of Focus on the Tenets of the Endangered Species Act*

While the FWS seemed to set out more strict regulations concerning escaped fish and pollutants under the ESA,²³¹ in delegating NPDES permitting authority to Maine, EPA did not see its action as "likely to jeopardize the continued existence of the wild Atlantic salmon."²³² Whether that is the case, EPA has a duty to ensure that Maine will maintain conditions that protect Atlantic salmon in its permitting under the CWA, and must object if Maine fails to meet that requirement in distributing permits.²³³

phosphorus, and biological oxygen demand calculated by Dr. Hardy. See *supra* note 217 and accompanying text.

²²⁷ U.S. CENSUS BUREAU, STATE & COUNTY QUICK FACTS, MAINE (2000), <http://quickfacts.census.gov/qfd/states/23000.html> (last visited Apr. 20, 2004).

²²⁸ Indemnity for Infectious Salmon Anemia, 67 Fed. Reg. at 17,608.

²²⁹ See U.S. CENSUS BUREAU, STATE & COUNTY QUICK FACTS, MAINE (2000), <http://quickfacts.census.gov/qfd/states/23/23029.html> (last visited Apr. 20, 2004) (setting out 33,573 as the estimated 2001 population of Washington County); U.S. CENSUS BUREAU, STATE & COUNTY QUICK FACTS, MAINE (2000), <http://quickfacts.census.gov/qfd/states/23/23009.html> (last visited Apr. 20, 2004) (setting out 52,336 as the estimated 2001 population of Hancock County).

²³⁰ See U.S. CENSUS BUREAU, STATE & COUNTY QUICK FACTS, MAINE (2000), <http://quickfacts.census.gov/qfd/states/23/23029.html> (last visited Apr. 20, 2004); U.S. CENSUS BUREAU, STATE & COUNTY QUICK FACTS, MAINE (2000), <http://quickfacts.census.gov/qfd/states/23/23009.html> (last visited Apr. 20, 2004); Hardy, *supra* note 223, at 48-50.

²³¹ Final Endangered Status for Anadromous Atlantic Salmon, 65 Fed. Reg. 69,459, 69,479 (Nov. 17, 2000) (codified at 50 C.F.R. pt. 17).

²³² Final Approval of the Maine Pollutant Discharge Elimination System Under CWA, 66 Fed. Reg. 12,791, 12,793 (Feb. 28, 2001).

²³³ *Id.* at 12,794 (noting, however, that "[n]o critical habitat has been designated for this species, therefore none will be affected").

by the Department of Agriculture were related to competition: Canada indemnified its salmon farmers and greatly reduced incidents of the ISA virus over a three-year period through a "comprehensive program"; and Chile and the European Union had banned the import of salmon eggs from anywhere in the United States.²⁴⁰

The control program required disease surveillance, site-specific action plans, a provision of fish inventory, and a control program for sea lice—a type of parasite which is "generally regarded as capable of transmitting ISA."²⁴¹ When fish are crowded together in high densities, with net pen conditions being a prime example, it is an ideal situation for rapid transmission of parasites such as sea lice.²⁴² Studies in Norway have demonstrated that *wild* salmon become infected with sea lice during migration, "with the highest infection levels occurring in salmon-farming areas."²⁴³ Even though sea lice are common, epidemics have developed in wild salmon in every country that produces significant amounts of farmed salmon.²⁴⁴

Harm to the endangered Atlantic salmon, illegal under the ESA, is likely to occur under current conditions in net pen aquaculture. Combined with the potential for salmon in net pen facilities to spread the ISA virus to endangered Atlantic salmon through sea lice is the constant, but more subtle, danger posed by escaped salmon.²⁴⁵ Limitations set by the ESA to protect Atlantic salmon become relatively worthless—and lead to competition with and dilution of the endangered Atlantic salmon—if they are: (1) unable to be enforced, as demonstrated by the continued escapes of farmed salmon and outbreaks of disease, both harmful to endangered Atlantic salmon; and (2) subsumed by the current Maine permitting process that could easily result in weak effluent guidelines, as evinced by the possibility of

is viewed as the "single most effective way to eliminate ISA." Indemnity for Infectious Salmon Anemia, 67 Fed. Reg. at 17,608–09.

²⁴⁰ Declaration of Emergency Because of Infectious Salmon Anemia, 66 Fed. Reg. at 65,679.

²⁴¹ Indemnity for Infectious Salmon Anemia, 67 Fed. Reg. at 17,607. There are actually two species of sea lice; both "infest Atlantic salmon and live in the mucus layer, where they attach and suck blood or cause sores." *Id.* It is the larger species that is believed to transmit the ISA virus. *Id.*

²⁴² See GOLDBURG & TRIPLETT, *supra* note 7, at 163 (stating, however, that Atlantic salmon are generally quite healthy, and migrate past the net pens at times when it is likely that the sea lice problem is at a very low level).

²⁴³ GOLDBURG ET AL., *supra* note 12, at 9.

²⁴⁴ *Id.*

²⁴⁵ Final Endangered Status for Anadromous Atlantic Salmon, 65 Fed. Reg. 69,459, 69,479 (Nov. 17, 2000) (codified at 50 C.F.R. pt. 17).

meaningless federal effluent guidelines, leading to the more indirect harm through a polluted habitat.²⁴⁶

By enforcing the district court's injunctive relief and denying Atlantic and Stolt's claim that they should only be governed by the MPDES general permit, the First Circuit's actions were in harmony with the purpose of the ESA.²⁴⁷ The general permit issued by the DEP does very little to protect the endangered Atlantic salmon.²⁴⁸ According to the DEP's general permit, "non-native salmon can be re-stocked until July 31, 2004; thereafter the stocking must be of native salmon unless the permit holder proves that native stock is not available in sufficient quantities to match the farm's prior stocking level based on historical data."²⁴⁹ The injunctive relief, clearly more protective of the endangered Atlantic salmon, bans the stocking of non-native salmon, bans any future stocking immediately, requires a greater period of fallowing for net pens, and allows only a single year class of salmon to be in a pen at a time.²⁵⁰ Because of the weakness of the DEP's permit regarding non-native species, the ESA would likely forbid it.

Atlantic argued that a rule as stringent as that of the district court would put it out of business.²⁵¹ Because of its reliance on European salmon, "[i]t would take four years for [Atlantic] to grow a new brood stock of North American salmon to replace" its current stock.²⁵² If Atlantic was lost as an employer, the local community would feel the effects: "[s]almon farms make up 15 percent of the city's property-tax base, and many of the industry's 1,200 jobs belong to Eastport citizens."²⁵³ Despite considering Atlantic's financial woes and the pendency of the general permit, the district court had no sympathy for Atlantic, stating that "[i]t is the Court's perception that [Atlantic]'

²⁴⁶ See Final Approval of the Maine Pollutant Discharge Elimination System Under CWA, 66 Fed. Reg. 12,791, 12,793 (Feb. 28, 2001); Beth Daley, *Escaped Farm Salmon Raise Alarm in Maine*, BOSTON GLOBE, Feb. 23, 2001, at A1 (citing the escape of 100,000 salmon from Atlantic's pens during a winter storm, along with other escapes). Both the FWS and EPA, however, are demanding the marking or tagging of net pen fish to allow tracing of escapees and the phasing out of European or European-hybrid salmon. Interview, *supra* note 39.

²⁴⁷ See *Salmon IV*, 339 F.3d 23, 34–35 (1st Cir. 2003); discussion *supra* Part II.G.

²⁴⁸ See *Salmon IV*, 339 F.3d at 30.

²⁴⁹ *Id.*

²⁵⁰ *Id.* at 29–30. The general permit covers all Maine salmon farming operations. *Id.* at 27. USPIRG has challenged this general permit, but it is unlikely that the trial will begin until the spring of 2004. *Id.*

²⁵¹ *Salmon II*, 261 F. Supp. 2d 17, 23 (D. Me. 2003).

²⁵² John Richardson, *Impact of Ruling on Hybrid Fish Assessed*, PORTLAND PRESS HERALD, May 30, 2003, at 1B.

²⁵³ *Id.*

leadership has single-mindedly pursued a policy, in the interests of the company's economic well being and future profitability, of frustrating the fruition of all efforts by the regulatory authorities, such as they have been, and by this Court to secure its compliance."²⁵⁴

C. Other Significant Aspects of Aquaculture

Combined with concerns stemming from excess feed given to net pen salmon are the concerns associated with the source of that food. Because salmon are carnivorous fish, current feeding patterns rely heavily on protein from fish meal and fish oil.²⁵⁵ The fish meal and fish oil comes from small, wild-caught fish.²⁵⁶ Producing one pound of salmon requires 2.44 pounds of fish meal and fish oil.²⁵⁷ Thus, the production of farmed salmon does not reduce the pressure on wild fisheries, which is a significant problem.²⁵⁸

Due to the shrinking resources of wild fisheries and despite the rapid expansion of aquaculture, the United States still does not produce all of the seafood that it consumes.²⁵⁹ Between 1989 and 1998, the production of Atlantic salmon by facilities in the United States increased 468%.²⁶⁰ The federal government has invested heavily in aquaculture, both through indemnifying CAAPFs for the salmon that had to be destroyed due to ISA,²⁶¹ and funding aquaculture through

²⁵⁴ U.S. Pub. Interest Research Group v. Atl. Salmon of Me., LLC, 262 F. Supp. 2d 1, 3 n.1 (D. Me. 2003).

²⁵⁵ GOLDBURG & TRIPLETT, *supra* note 7, at 8. For salmon, from fifty to seventy percent of feed is made from fish meal and fish oil. *Id.* at 27.

²⁵⁶ *Id.* at 8.

²⁵⁷ *Id.* at 11.

²⁵⁸ *Id.* at 8. "Twenty-seven percent . . . of the world's total wild fisheries production is now converted to animal feeds." Fifteen percent of this is used for feeding fish. *Id.* As of 2002, pressure on worldwide wild fish stocks continued to increase: 25% of major marine fish stocks were under, or moderately, exploited; 47% were at maximum sustainable limits; 18% were overexploited; and 10% were significantly depleted. UNITED NATIONS, FOOD AND AGRICULTURE ORGANIZATION, THE STATE OF WORLD FISHERIES AND AQUACULTURE 22-23 (2002), <http://www.fao.org/docrep/005/y7300e/y7300e00.htm> (last visited Apr. 20, 2004). "More than 70 percent of commercial fish stocks are now considered fully exploited, overfished or collapsed." William J. Broad & Andrew C. Revkin, *Has the Sea Given up its Bounty?*, N.Y. TIMES, July 29, 2003, at F1. "Recent studies estimate that stocks of many fishes are now a tenth of what they were 50 years ago . . . Industry calls it 'biomass extraction' and turns the harvest into everything from fish sticks to protein concentrates for livestock or pellets to feed cage-raised salmon." *Id.*

²⁵⁹ GOLDBURG & TRIPLETT, *supra* note 7, at 8.

²⁶⁰ GOLDBURG ET AL., *supra* note 12, at 2.

²⁶¹ Indemnity for Infectious Salmon Anemia, 67 Fed. Reg. 17,605, 17,608-09 (proposed Apr. 11, 2002) (interim rule).

the U.S. Department of Agriculture and the National Oceanic and Atmospheric Administration.²⁶² Despite this, the trade deficit for United States in seafood is \$6.2 billion.²⁶³

CONCLUSION

The proposed national effluent guidelines and the DEP's general permit are too weak to accomplish the purposes of the CWA or the ESA. While the national guidelines could serve as a baseline, allowing the real regulation of Maine's net pen aquaculture facilities to be determined by Maine, effective regulation needs to take more into account than EPA has considered. While Atlantic and Stolt have been enjoined from introducing a new class of salmon²⁶⁴ and Heritage can farm salmon in accordance with a settlement, the DEP's general permit will allow other salmon facilities to operate under ineffectual standards. While these practices do not conform with the purposes of the CWA, discharges in accordance with a MEPDES permit are allowed. Since these net pen facilities are arguably worth the environmental costs, the focus should be on aspects of production that can be beneficially altered.

The massive quantity of waste produced by the salmon in Maine's waters is the least likely aspect of salmon production to be changeable. If this untreated effluent is determined to be a minor harm, regulation should instead focus on practices that would be worthwhile to change. In order to better protect the endangered Atlantic salmon, only Atlantic salmon should be raised in net pens, and greater care should be placed on ensuring that escapes are minimized. To increase water quality and reduce harm to the ocean floor under the net pens, sites should be fallowed more often and excess nutrient loading, such as excess feed and dead fish, should be removed. For overall benefits to water quality and endangered Atlantic salmon, the densities of stocked net pens should be reduced. This could reduce the spread and occurrence of disease, minimize the need for the addition of antibiotics and drugs to the receiving waters, and diminish the harm to the benthos through a decreased concentration of the wastes it absorbs.

²⁶² GOLDBURG ET AL., *supra* note 12, at 22. The U.S. Department of Agriculture has \$50 million budgeted for aquaculture, while the National Oceanic and Atmospheric Administration has budgeted "roughly 12 million to 14 million dollars." *Id.*

²⁶³ *Id.* at 2.

²⁶⁴ Stolt decided against introducing a new class of salmon and did not require the contempt proceedings that were initiated against Atlantic.

A complete halt to the net pen industry would be an undesirable outcome to this situation. If the facilities are simply permitted as they now exist, however, and continue the same aquaculture practices, a successful suit under the ESA is possible. Such a suit could lead to a complete shut down of net pen aquaculture in Maine, especially when considering that the ESA explicitly does not contemplate a balancing of the equities for injunctions, which the District Court of Maine contemplated before granting the injunction under the CWA. Thus, not surprisingly, Maine, along with Atlantic, Stolt, and others, fought the listing of Atlantic salmon as an endangered species.

The growing demand for farmed fish, along with increased employment opportunities and revenue produced by aquaculture in Maine should be encouraged and developed in the United States without dismissing environmental concerns. Otherwise, the United States will continue to import the majority of farmed fish from other nations that lack environmental regulation. That would be an unwanted outcome, environmentally and economically.