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The Difficult Problem of Nonpoint Nutrient Pollution: Could the Endangered Species Act Offer Some Relief?

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THE DIFFICULT PROBLEM OF NONPOINT NUTRIENT POLLUTION: COULD THE ENDANGERED SPECIES ACT OFFER SOME RELIEF?

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ABSTRACT

Nutrient pollution of rivers, streams, lakes, and estuaries is one of the preeminent water quality issues in the United States today, and poses a significant threat to the health of aquatic ecosystems. Agricultural nonpoint discharges, the runoff of nitrogen and phosphorous from animal manure and chemical fertilizers, are the primary sources of such nutrient pollution.

A pervasive and long-standing problem, nonpoint pollution, nutrient and otherwise, has proven to be one of the toughest challenges in contemporary environmental regulation. This situation is significantly attributable to the political and administrative dynamics of fragmented regulatory authority. The power to control such nonpoint discharges remains largely beyond the reach of federal Clean Water Act authority, and rests with the states, who have proven to be reluctant regulators.

This Article proposes a new, conceptually different approach to changing the regulatory status quo and tackling the problem of nonpoint nutrient pollution. It draws a roadmap for a strategic leveraging of the Endangered Species Act, particularly Section 9, against individual nonpoint dischargers and/or their state regulators. It starts with the widespread ecological damage from nonpoint nutrient pollution and looks for a regulatory silver lining to the harmful effects that such nutrient pollution is having on threatened and endangered species of aquatic wildlife. The core objective is to show how the strong protections ESA provides for listed wildlife can be leveraged to better protect the broader nutrient-afflicted aquatic ecosystems of which listed species are but one part.

INTRODUCTION

Nutrient pollution of rivers, streams, lakes, and estuaries is one of the preeminent water quality issues in the United States today, and

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a significant threat to the health of aquatic ecosystems.[1] Agricultural nonpoint discharges, the runoff of nitrogen and phosphorous from animal manure and chemical fertilizers, are the primary sources of such nutrient pollution.[2]

The Gulf of Mexico dead zone,[3] hypoxia-caused damages to the Chesapeake's rich and complex ecosystem,[4] and nutrient-driven alterations of unique plant communities in Florida's remarkable "river of grass"[5] are some of the more dramatic and familiar consequences of aquatic nutrient pollution. The profound ecological effects of nutrient enrichment, including many nutrient-driven changes in ecosystem structure and function, are experienced across the nation's watersheds.[6]

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[1] OFFICE OF THE INSPECTOR GENERAL, ENVTL. PROT. AGENCY, EPA NEEDS TO ACCELERATE ADOPTION OF NUMERIC NUTRIENT WATER QUALITY STANDARDS 1 (2009) [hereinafter EPA OIG]; ENVTL. PROT. AGENCY, WADEABLE STREAMS ASSESSMENT: A COLLABORATIVE SURVEY OF THE NATION'S STREAMS ES-6 (2006) [hereinafter EPA 2006], *available at* http://www.epa.gov/owow/streamsurvey/pdf/WSA_Assessment_May2007.pdf; ENVIRONMENTAL LAW AND POLICY CENTER, CULTIVATING CLEAN WATER: STATE-BASED REGULATION OF AGRICULTURAL RUNOFF POLLUTION 1 (2010) [hereinafter ELPC], *available at* http://elpc.org/wp-content/uploads/2010/05/ELPC-Cultivating-Clean-Water-updated-May-5-2010.pdf; NATIONAL QUALITY ASSESSMENT PROGRAM, U.S. GEOLOGICAL SURVEY, THE QUALITY OF OUR NATION'S WATERS: NUTRIENTS IN THE NATION'S STREAMS AND GROUNDWATER 1992–2004 1 (2010) [hereinafter USGS], *available at* http://pubs.usgs.gov/circ/1350/pdf/circ1350.pdf.

[2] ELPC, *supra* note 1, at 1–3.

[3] Nancy N. Rabalais et al., *Gulf of Mexico Hypoxia, a.k.a. "The Dead Zone,"* 33 ANN. REV. OF ECOLOGY & SYSTEMATICS 235, 236 (2002); Walter K. Dodds, *Nutrients and the "Dead Zone": The Link Between Nutrient Ratios and Dissolved Oxygen in the Northern Gulf of Mexico*, 4 FRONTIERS IN ECOLOGY & THE ENV'T 211 (2006); *see also* NATIONAL RESEARCH COUNCIL, IMPROVING WATER QUALITY IN THE MISSISSIPPI RIVER BASIN AND NORTHERN GULF OF MEXICO: STRATEGIES AND PRIORITIES 11 (2010).

[4] *See, e.g.*, Donald F. Boesch et al., *Chesapeake Bay Eutrophication: Scientific Understanding, Ecosystem Restoration, and Challenges for Historical Trends and Ecological Interactions*, 30 J. ENVTL. QUALITY 303, 305–07 (2001); W.M. Kemp et al., *Eutrophication of Chesapeake Bay: Historical Trends and Ecological Interactions*, 303 MARINE ECOLOGY PROGRESS SERIES 1, 4–6 (2005); *see generally* NAT'L ACADEMIES PRESS, ACHIEVING NUTRIENT AND SEDIMENT REDUCTION GOALS IN THE CHESAPEAKE BAY: AN EVALUATION OF PROGRAM STRATEGIES AND IMPLEMENTATION 1–29 (2011).

[5] *See, e.g.*, Connie Chiang et al., *Effects of 4 Years of Nitrogen and Phosphorus Additions on Everglades Plant Communities*, 68 AQUATIC BOTANY 61, 62–63 (2000); Gregory B. Noe et al., *Phosphorus Biogeochemistry and the Impact of Phosphorus Enrichment: Why Is the Everglades so Unique?*, 4 ECOSYSTEMS 603, 609, 618–19 (2001); Curtis J. Richardson et al., *Estimating Ecological Thresholds for Phosphorus in the Everglades*, 41 ENVTL. SCI. & TECH. 8084 (2007); *see also* U.S. FISH & WILDLIFE SERV., EVERGLADE SNAIL KITE: MULTI-SPECIES RECOVERY PLAN FOR SOUTH FLORIDA 4-294, 4-295 (1999), *available at* http://www.fws.gov/verobeach/MSRPPDFs/EvergladeSnailKite.pdf.

[6] *See infra* notes 46–50 and accompanying text.

Perhaps unsurprisingly, imperiled aquatic wildlife is also at the receiving end of nutrient enrichment and its various repercussions. Altered nutrient inputs are currently a threat to an estimated twenty-five percent of imperiled freshwater fauna.[7] Nutrient-driven anoxia and hypoxia are, for example, increasing juvenile mortality and interfering with the reproduction of southeastern populations of the endangered shortnose sturgeon.[8] Nutrient-triggered expansion of invasive plants in Florida's Everglades impairs the foraging of the endangered Everglade snail kite.[9] Additionally, surviving populations of several unique, highly imperiled federally listed species of southeastern freshwater snails are significantly threatened by nonpoint nutrient pollution.[10] In the aggregate, nonpoint nutrient discharges from agriculture, along with agricultural alteration of sediment loads, constitute one of the three leading threats to imperiled freshwater fauna in the United States.[11]

Current aquatic nutrient pollution in the United States is largely the result of regulatory failure. The most critical is the notable failure of the broader U.S. water pollution control regime to regulate discharges from nonpoint sources ("NPS"), especially agriculture, into surface and subsurface waters. The vast majority of nonpoint discharges remain outside of the regulatory reach of the Clean Water Act ("CWA") and beyond the reach of its most effective and most successful pollution control program, the binding and enforceable National Pollutant Discharge Elimination System ("NPDES") program for control and permitting of point source discharges.[12]

Under the current scheme of cooperative environmental federalism, direct control over NPS discharges belongs to the states. Many states, in the face of strong resistance from the politically influential

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[7] B. Richter et al., *Threats to Imperiled Freshwater Fauna*, 11 CONSERVATION BIOLOGY 1081, 1086 (1997).

[8] *See* Jed G. Campbell & Larry E. Goodman, *Acute Sensitivity of Juvenile Shortnose Sturgeon to Low Dissolved Oxygen Concentrations*, 133 TRANSACTIONS OF THE AM. FISHERIES SOC'Y 772, 775 (2004); M.R. Collins et al., *Primary Factors Affecting Sturgeon Populations in the Southeastern United States: Fishing Mortality and Degradation of Essential Habitats*, 66 BULL. MARINE SCI. 917, 918 (2000); D.H. SECOR & E.J. NIKLITSCHEK, HYPOXIA AND STURGEONS: REPORT TO THE CHESAPEAKE BAY PROGRAM DISSOLVED OXYGEN CRITERIA TEAM 3–5, 9 (2001); *see also* Kemp et al., *supra* note 4, at 17.

[9] U.S. FISH & WILDLIFE SERV., *supra* note 5, at 4-299.

[10] U.S. FISH & WILDLIFE SERV., RECOVERY PLAN FOR MOBILE RIVER BASIN AQUATIC ECOSYSTEM 21–22 (2000).

[11] Richter et al., *supra* note 7, at 1087–89; *see also* David Wilcove et al., *Quantifying Threats to Imperiled Species in the United States*, 48 BIOSCIENCE 607, 611–12 (1998).

[12] *See infra* notes 59–62 and accompanying text.

agricultural and silvicultural lobbyists,[13] have proven reluctant to exercise their regulatory authority. State reluctance continues in spite of federal exhortations, incentives, and hand-holding in the form of technical and procedural guidance.[14]

In their control of NPS discharges in general, and agricultural NPS discharges in particular, many states have commonly relied on voluntary Best Management Practices ("BMPs") backed by economic incentives for compliance. In doing so they tacitly or explicitly have been exempting agricultural discharges from the otherwise applicable requirements of general state water quality statutes,[15] and failing to apply CWA-mandated Total Maximum Daily Load ("TMDL") discharge limitations to nonpoint sources, whose runoff adds to the pollution of already impaired waters.[16] Even states with binding and comprehensive regulatory controls over agricultural nonpoint discharges, such as California, have continued to emphasize cooperative and voluntary means of implementation, scrupulously avoiding enforcement against agricultural dischargers.[17] Across

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[13] *See, e.g.*, Oliver Houck, *The Clean Water Act TMDL Program V: Aftershock and Prelude*, 32 ENVTL. L. REP. 10385, 10416 (2002) [hereinafter Houck 2002]; *see also* Oliver Houck, *The Clean Water Act Returns (Again): Part I, TMDLs and the Chesapeake Bay*, 41 ENVTL. L. REP. 10208, 10208–210, 10213, 10215, 10218, 10219 (2011) [hereinafter Houck 2011]; *see also* J.B. Ruhl, *Farms, Their Environmental Harms, and Environmental Law*, 27 ECOLOGY L.Q. 263, 293, 308–09 (2000).

[14] *See, e.g.*, Robert Adler, *Water Quality and Agriculture: Assessing Alternative Futures*, 25 ENVIRONS ENVTL L. & POL'Y J. 77, 88 (2002); Scott Anderson, *Watershed Management and Nonpoint Source Pollution: The Massachusetts Approach*, 26 B.C. ENVTL. AFF. L. REV. 339, 358 (1999); David Zaring, *Agriculture, Nonpoint Source Pollution, and Regulatory Control: The Clean Water Act's Bleak Present and Future*, 20 HARV. ENVTL. L. REV. 515, 527–28 (1996); *see also* ENVTL. LAW INST., ENFORCEABLE STATE MECHANISMS FOR THE CONTROL OF NONPOINT SOURCE WATER POLLUTION 1, 6 (1997) [hereinafter ELI 1997]; ENVTL. LAW INST., ALMANAC OF ENFORCEABLE STATE LAWS TO CONTROL NONPOINT SOURCE WATER POLLUTION 3 (1998) [hereinafter ELI 1998]; ENVTL. LAW INST., PUTTING THE PIECES TOGETHER: STATE NONPOINT SOURCE ENFORCEABLE MECHANISMS IN CONTEXT i–ii (2000) [hereinafter ELI 2000]; EPA OIG, *supra* note 1, at 5.

[15] *See* ELI 1997, *supra* note 14, at 1; ELI 2000, *supra* note 14, at 1; *see also* ELPC, *supra* note 1, at 3; MICHELLE PEREZ, ENVTL. WORKING GROUP, FACING FACTS IN THE CHESAPEAKE BAY 1–3 (2009) [hereinafter EWG], *available at* http://static.ewg.org/reports/2009/FacingFactsInTheChesapeakeBay.pdf.

[16] *See, e.g.*, CLAUDIA COPELAND, CONGRESSIONAL RESEARCH SERVICE, WATER QUALITY: IMPLEMENTING THE CLEAN WATER ACT 8–9 (2006); Adler, *supra* note 14, at 77; Houck 2002, *supra* note 13, at 10385; David Smith, *Water Quality and Agriculture: How Can TMDLs Help?*, 25 ENVIRONS ENVTL. L. & POL'Y J. 93 (2000); *see also* Robert Adler, *TMDLs, Nonpoint Source Pollution and the Goals of the Clean Water Act*, PROGRESSIVE REFORM BLOG, http://www.progressivereform.org/perspTMDLs.cfm (last visited Apr. 2, 2013).

[17] *See* ELPC, *supra* note 1, at 11.

the board, states have also been slow to heed the EPA's call to transition from the inexact and hard-to-apply narrative water quality standards to numeric nutrient standards, which create a solid basis for identifying nutrient-impaired waters and controlling the dischargers responsible for the pollution of these waters.[18] The agricultural industry is vehemently opposed to anything that begins to hint at the possibility for binding and enforceable regulation, even something preliminary like setting numeric nutrient standards that facilitate the identification of pollution and enable the allocation of pollution reduction responsibilities among the responsible dischargers.[19]

The practical results of the states' preferred regulatory strategies arguably speak for themselves: fifty-three percent of the most recently assessed river and stream miles, 66.5% of assessed lake, pond, and reservoir acreage, and sixty-three percent of assessed estuarine areas are impaired.[20] An impaired body of water is defined as not in attainment of state-developed water quality standards and so unable to support designated uses.[21] Agricultural discharges are the leading cause of impairment in rivers and streams, and the third leading cause of impairment in lakes and reservoirs.[22] At least 14.5% of these impaired river and stream miles and at least twenty-six percent of the impaired lake and reservoir acreage are water-quality impaired by nutrients, with these numbers potentially a major underestimate due to inconsistencies in the

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[18] *See* OFFICE OF WATER, EPA, STATE ADOPTION OF NUMERIC NUTRIENT STANDARDS (1998–2008) 4–5 (2008); EPA 2006, *supra* note 1, at 2.

[19] *See, e.g.*, RICHARD BUDELL ET AL., FLA. DEP'T OF AGRIC. & CONSUMER SERVS., OFFICE OF AGRIC. WATER POLICY, ECONOMIC IMPACTS AND COMPLIANCE COSTS OF PROPOSED EPA NUMERIC NUTRIENT CRITERIA FOR FLORIDA AGRICULTURE 2 (2010); *see also* Steve Davies, *11th Circuit Upholds Florida Water Quality Settlement*, ENDANGERED SPECIES & WETLANDS REPORT, (Aug. 4, 2011, 11:16 PM), http://www.eswr.com/2011/08/11th-circuit-upholds-florida-water-quality-settlement/. Another important factor is the resistance of NPDES-regulated nutrient dischargers, such as industrial dischargers—municipally owned and publicly owned treatment works. These point sources are justifiably concerned that if agricultural dischargers continue to successfully evade discharge controls, they would once again have to shoulder the burden of additional discharge reductions identified as necessary under the new, more precise standards. *See, e.g.*, Meline MacCurdy, *EPA Proposal for Numeric Nutrient Standards for Florida Waters Has National Implications*, MARTEN LAW (Feb. 3, 2010), http://www.martenlaw.com/newsletter/20100203-numeric-nutrient-standards; *see also* Houck 2002, *supra* note 13, at 10385.

[20] *National Summary of State Information*, ENVTL. PROT. AGENCY, http://iaspub.epa.gov/waters10/attains_nation_cy.control (last updated Apr. 10, 2013).

[21] *Glossary*, ENVTL. PROT. AGENCY, http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/glossary.cfm#I (last updated Mar. 6, 2012).

[22] ENVTL. PROT. AGENCY, *supra* note 20.

state reporting of impairment causes, which these aggregate statistics are based on.[23]

Filling the existing regulatory gaps through a legislative strengthening of federal controls over NPS discharges, or even tightening regulatory controls within the existing jurisdictional bounds of the CWA, seems unlikely. This is particularly so considering the ongoing resistance and political clout of the regulated community and of agricultural interests in particular.[24] It also does not seem wise to hold one's breath for a major upsurge of new and appreciably more effective state regulatory interventions, given abiding state deference to the preferences and regulatory resistance of the regulated agricultural community.[25]

Various strategic attempts to improve controls on NPS discharges by working inside the margins of the CWA have also been met with resistance from the regulated community. For example, the recent litigation that succeeded in getting the Ninth Circuit to reclassify runoff from logging roads as a point source subject to the permitting and discharge limitations of the NPDES program[26] has met with strong resistance from the logging community and local government.[27] As such, their present success

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[23] For example, some states report impairments related to nutrient enrichment under other categories of impairment. One such category is impairment by "Organic Enrichment/ Low Dissolved Oxygen" which can, and sometimes does, include oxygen depletion from "Nitrogenous BOD." *See Specific State Causes of Impairment that Make up the National Organic Enrichment / Oxygen Depletion Cause of Impairment Group for Threatened and Impaired Rivers and Streams Reporting Year 2008*, ENVTL. PROT. AGENCY, http://ofmpub.epa.gov/tmdl_waters10/attains_nation.cause_wbtype_detail?p_cycle=2008&p_cause_group_name=ORGANIC%20ENRICHMENT/OXYGEN%20DEPLETION&p_wbtype=STREAM/CREEK/RIVER&p_wtype_display=Rivers%20and%20Streams&p_sz_column=%20size_1&p_sz_unit=miles (last visited Apr. 2, 2013).

[24] *See, e.g.*, Justin A. Ritter, *AFBF v. EPA: Synopsis of AFBF's Summary Judgment Motion*, AGRICULTURAL LAW RESOURCE AND REFERENCE CENTER (Feb. 17, 2012), http://law.psu.edu/_file/aglaw/Chesapeake_Bay/AFBF_v_EPA.pdf (describing the current AFBF lawsuit challenging the EPA-issued regional TMDL for the Chesapeake—in spite of the fact that the TMDL is just a standard that EPA has no power to implement). The EPA promulgated TMDL after years of failure of voluntary measures to reduce water quality degradation by discharges of nutrients and sediment (largely nonpoint). CLAUDIA COPELAND, CONGRESSIONAL RESEARCH SERVICE, CLEAN WATER ACT AND POLLUTANT TOTAL MAXIMUM DAILY LOADS (TMDLS) 1 (2012). These failures prompted environmental non-governmental organizations ("ENGOs") to sue the EPA to push it to implement the standard. *See id.*

[25] *See, e.g.*, ELPC, *supra* note 1, at 4; EWG, *supra* note 15, at 1; Houck 2002, *supra* note 13, at 10387.

[26] *See* Nw. Envtl. Def. Ctr. v. Brown, 640 F.3d 1063 (9th Cir. 2011); *cert granted* Decker v. Nw. Envtl. Def. Ctr., 132 U.S. 865 (2012).

[27] *See* Cassandra Profita, *NW Congressional Leaders: Let Logging Roads Be*, ECOTROPE (July 14, 2011, 9:55 AM), http://www.opb.org/news/blog/ecotrope/nw-congressional-leaders-let-logging-roads-be/.

may prove only temporary. In other words, controlling NPS pollution and NPS nutrient pollution is proving to be among the more pernicious policy and regulatory challenges in contemporary environmental regulation.

This Article explores a new, conceptually different approach to overcoming this challenge. Specifically, it outlines a legal strategy for strengthening the controls and prevention of nonpoint nutrient pollution through leveraging key provisions of the Endangered Species Act ("ESA") against individual NPS dischargers and/or their state regulators.

This strategy starts with the widespread ecological damage from nonpoint nutrient pollution and seeks a regulatory silver lining to the harmful effects of such pollution on federally listed species of aquatic wildlife, given the strong protections that the ESA, especially Section 9, provides for such species against the harmful effects of both private and governmental actions. The strategy explored here, in short, seeks to achieve a measure of improvement in the practical and/or regulatory control of NPS discharges by using a point of leverage outside the limited regulatory reach of the CWA.

This line of analysis is in significant part motivated by insights from a previous paper, which explored the potential of the ESA to protect listed wildlife from the growing threat of atmospheric nitrogen deposition,[28] which is another broad ecological threat that is poorly addressed by the current regime for regulating air quality in the U.S.[29]

While broadly modeled on our previous paper, the current analysis is not limited to examining the capacity of the ESA to protect a particular species of federally listed wildlife from nutrient-related harm. Rather, it develops the broad parameters of a strategy for using Section 9 of the ESA to ratchet the regulatory controls of nonpoint nutrient discharges from agriculture. It suggests that there are promising possibilities for reducing agricultural nutrient pollution, as well as other types of nonpoint pollution, through leveraging the "harm" and "take" prohibitions of the ESA against individual nonpoint dischargers and their state regulators. Such possibilities are waiting to be explored in actual practice.

This Article provides a roadmap for the strategic use of ESA Section 9 to help not just listed wildlife affected by nutrient pollution,

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[28] Zdravka Tzankova et al., *Can the ESA Address the Threats of Atmospheric Nitrogen Deposition? Insights from the Case of the Bay Checkerspot Butterfly*, 35 HARV. ENVTL. L. REV. 434, 436 (2011).

[29] An air quality regime anchored in the federal CAA, similar to the water quality regime anchored in the CWA, features a cooperative federalism arrangement of federal-state sharing of regulatory responsibilities.

but the broader nutrient-afflicted aquatic ecosystems of which listed wildlife is but one part. It leaves much of the detailed work of identifying and fully developing specific Section 9 cases to the water quality and conservation environmental non-governmental organizations ("ENGOs") who are already working to advance the health of aquatic ecosystems.

Part I of this Article offers a brief introduction to the technical side of aquatic nutrient pollution, with an emphasis on the ecological consequences of nutrient enrichment. Part II discusses the main policy and regulatory factors responsible for the persistence of nonpoint nutrient pollution in U.S. waters. Part III provides a brief overview of the Endangered Species Act. Part IV offers the critical core of this Article, outlining the most promising uses of the Endangered Species Act as a lever in improving regulatory control of the nonpoint nutrient pollution plaguing many of our aquatic ecosystems and environments, including some of the most biologically unique and diverse ones.[30] This section also discusses some likely policy and regulatory consequences of such ESA leveraging, including changes in the broader regulatory calculus and attitudes of the thus far resistant agricultural community (agricultural nonpoint dischargers), and potential jolts to reluctant states towards regulatory action. Finally, the Article ends with some concluding thoughts on the potential and limits of the ESA-based strategy for improving the regulatory control of nonpoint pollution.

I. AQUATIC NUTRIENT POLLUTION: THE ECOLOGICAL PREDICAMENT

Aquatic nutrients—nitrogen, phosphorous, and their common compounds, like nitrates, phosphates and ammonia—are, as their very collective denomination clearly suggests, a necessary component to the normal functioning of aquatic ecosystems.[31] As a key food source for the aquatic plants at the base of aquatic food webs, nitrogen and phosphorous are in fact an important pillar of aquatic ecosystems.[32]

Nutrient pollution can be largely described as too much of a good thing. Its ecological consequences, however, are no less significant because nutrient-caused disruptions to aquatic ecosystems are measured in relative and ecosystem-specific threshold terms, rather than absolute and universal ones.

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[30] *See* U.S. FISH & WILDLIFE SERV., *supra* note 10; Charles Lydeard & Richard L. Mayden, *A Diverse and Endangered Aquatic Ecosystem of the Southeast United States*, 9 CONSERVATION BIOLOGY 800, 803–04 (1995).
[31] *See* USGS, *supra* note 1, at 21–40.
[32] *See id.*

There is "a great deal of variability in inherent nutrient levels and nutrient responses throughout the country. . . . due to differences in geology, climate and waterbody type."[33] However, fresh waters, particularly lakes and reservoirs, tend to be phosphorous-limited, while brackish and estuarine waters are generally nitrogen-limited.[34] Useful characterizations on the natural nutrient variability across U.S. ecoregions and waterbody types can be found in EPA guidance documents developed to assist and enable the states in developing numeric nutrient standards for water quality.[35] The EPA considers numeric standards a first and critical step in restoring nutrient-impaired waters, protecting waters from becoming impaired, and generally accomplishing the goals of the CWA; and the EPA has long, and often unsuccessfully, urged the states to adopt these standards.[36]

Whatever their baseline levels, naturally occurring limitations in the biologically available supply of nitrogen and phosphorous serve important regulatory functions in aquatic ecosystems. Yet these natural limitations are currently exceeded for a large fraction of the nation's fresh and estuarine waters. This condition of nutrient pollution has persisted for the past several decades,[37] and is significantly driven by nonpoint nutrient discharges, particularly agricultural runoff of fertilizers and manure.[38]

A recent U.S. Geological Survey ("USGS") assessment of nutrients in the nation's streams and groundwater found nutrient concentrations in streams routinely measuring two to ten times greater than appropriate for wildlife protection, with median concentrations of total nitrogen and phosphorous in agricultural streams about six times greater than background levels.[39] More generally, USGS concludes that "increases in

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[33] OFFICE OF WATER, ENVTL. PROT. AGENCY, NATIONAL STRATEGY FOR THE DEVELOPMENT OF REGIONAL NUTRIENT CRITERIA iv (1998) [hereinafter EPA 1998], *available at* http://water.epa.gov/scitech/swguidance/standards/upload/2009_01_21_criteria_nutrient_strategy_nutstra3.pdf.

[34] *See* NCSU Water Quality Group, *Algae,* WATER SHEDSS, http://www.water.ncsu.edu/watershedss/info/algae.html (last visited Apr. 2, 2013).

[35] *See* EPA OIG, *supra* note 1, at 6.

[36] *See* EPA 1998, *supra* note 33, at iii; EPA OIG, *supra* note 1, at 2.

[37] See USGS, *supra* note 1, at 1.

[38] *See* ELPC, *supra* note 1, at 1–2; USGS, *supra* note 1, at 30. Other nonpoint sources such as urban runoff, certain types of point sources, and most notably, publicly owned treatment works and sewage processing plants are also contributors to nutrient enrichment. Their role as a source of nutrient pollution can be significant in certain places. Many of these other types of sources, however, can be regulated as point sources under the CWA, and thus they remain outside the scope of the present analysis.

[39] USGS, *supra* note 1, at 5.

nutrient loadings from agricultural and, to a lesser extent, urban sources have resulted in nutrient concentrations in many streams and parts of aquifers that exceed standards for protection of human health and (or) aquatic life, often by large margins."[40] The assessment also found little change in nitrogen and phosphorous for the ten year period studied, 1993–2003.[41] Changes in nutrient concentrations, where they did occur, more often trended upward rather than downward.[42] Data from the EPA's biennial water quality reports to Congress further corroborates this trend of steady, persistent nutrient pollution and indicates its extension into the most recent decade.[43] EPA data also testifies to the continued primacy of nonpoint sources and agricultural nonpoint sources as the causes of such pollution.[44]

Or, as starkly summarized by a recent report compiled by the Environmental Law and Policy Center and the Mississippi River Collaborative and aspirationally titled *Cultivating Clean Water: State-Based Regulation of Agricultural Runoff Pollution*:

> *The negative effects of nitrogen and phosphorus pollution on aquatic systems have been documented nationwide.* In December 2006, the United States Environmental Protection Agency (U.S. EPA) issued a report from its Wadeable Streams Assessment, which concluded that 42% of the nation's streams are in poor biological condition and [only] 25% are in fair condition. *Nitrogen and phosphorus were identified as major stressors contributing to degraded biological conditions: 31% of studied streams had high levels of phosphorus and 32% had high levels of nitrogen.* Similarly 64% of assessed lakes were listed as impaired. Of these impaired waters, about 20% were listed as impaired because of nutrient pollution. However these figures are necessarily an underestimate because many states have a policy of not recognizing nutrient impairments.

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[40] *Id.* at 1.
[41] *Id.*
[42] *Id.*
[43] *National Summary of Impaired Waters and TMDL Information*, ENVTL. PROT. AGENCY, http://iaspub.epa.gov/waters10/attains_nation_cy.control?p_report_type=T (last updated Apr. 2, 2013).
[44] *See id.*; *see also* ELPC, *supra* note 1, at 1–2.

> *Although nitrogen and phosphorus pollution comes from several sources, agriculture is by far the largest source.* Agricultural contributions of nitrogen and phosphorus to the Gulf of Mexico are 71% and 80%, respectively. Livestock production nationwide generates over a billion tons of manure each year, much of which ends up in our nation's water. For perspective, that is fifty times the amount of human sewage treated annually in this country. Row crop production occurs on over 313 million acres of land. Animal manure and chemical fertilizers are applied to much of this land, yet only a fraction of the nitrogen and phosphorus in those applications is actually used by plants. Excess nitrogen and phosphorus fertilizer runs off the land, degrading water quality locally and far downstream.[45]

By disrupting historic natural limits to nutrient availability and altering nutrient ratios, this anthropogenic nutrient enrichment triggers a range of ecological effects, including profound changes in ecosystem structure and function. Many of these effects start with eutrophication, which is the increased accumulation of plant biomass in response to increased nutrient inputs,[46] as algae is often the first to respond to an increase in nutrient inputs.[47] The nutrient-triggered growth in algal biomass can, in turn, produce an array of secondary consequences for aquatic ecosystems. In streams, for example, excessive plant growth can reduce stream velocity.[48] Lower stream velocity causes greater deposition of fine sediments along the stream bottom, which reduces quality and availability of streambed habitat, and causes reduction or loss of bottom-dwelling organisms.[49] In estuarine environments, nutrient-triggered accumulation of plant or algal biomass can increase turbidity and decrease light availability, killing off submerged aquatic vegetation. Thus it eliminates the structurally complex benthic habitat provided by such vegetation, a habitat with critical ecological functions as a refuge, feeding, and nursery area for fish and invertebrates.[50]

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[45] ELPC, *supra* note 1, at 2 (emphasis added); *see also* EPA 2006, *supra* note 1; EPA OIG, *supra* note 1, at 1–2.
[46] *See* Rabalais et al., *supra* note 3, at 237 (citing Nixon, *Coastal Marine Eutrophication: A Definition, Social Causes and Future Concerns*, 41 OPHELIA 199, 199–200 (1995)).
[47] USGS, *supra* note 1, at 127.
[48] *Id.* at 124.
[49] *Id.*
[50] *See* Rabalais et al., *supra* note 3, at 235–37.

Aquatic oxygen deficiencies, including severe forms of anoxia and hypoxia, commonly result from the death and decomposition of accumulated algal biomass, and these are the consequences commonly associated with aquatic nutrient enrichment in the nation's waters.[51]

As illustrated by the case of the Everglade snail kite, a locally endangered bird-of-prey, the common sequence leading from nutrient enrichment to the generally damaging species and ecosystem consequences of aquatic oxygen deficiency is not limited to aquatic species.[52]

II. NONPOINT NUTRIENT POLLUTION: THE REGULATORY PREDICAMENT

The EPA has been trying to tackle the nutrient pollution problem for at least fifteen years, since the issues of nutrient pollution and especially agricultural nonpoint pollution were highlighted in the *Clean Water Action Plan* commissioned by Al Gore and the Clinton White House in 1998.[53] These issues were then almost immediately addressed in a *National Strategy for the Development of Regional Nutrient Criteria*, in which the EPA described the approach it intended to follow "in developing nutrient information and working with States and Tribes to adopt nutrient criteria as part of State water quality standards."[54] This approach included EPA development of guidance documents on the nutrient concentration levels appropriate for particular water body types, different geographic regions, and the various uses intended for a body of water, as well as the expectation that the states will use the guidance in adjusting their water quality standards to include numeric nutrient criteria appropriate for supporting the designated uses of each water body in their jurisdictions.[55] The 1998 national strategy, in other words, was the EPA's original attempt at encouraging and assisting the states to replace their difficult to monitor and implement narrative water quality criteria with clear, enforceable, and regionally appropriate numeric nutrient standards.

Yet nearly fifteen years later, the problem of nutrient pollution persists,[56] threatening to become what the EPA estimates to be "one of the costliest, most difficult environmental problems we face in the 21st

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[51] *See* EPA OIG, *supra* note 1, at 1.
[52] *See* U.S. FISH & WILDLIFE SERV., *supra* note 5, at 4-291, 4-303.
[53] ENVTL. PROT. AGENCY & U.S. DEP'T AGRIC., CLEAN WATER ACTION PLAN: RESTORING AND PROTECTING AMERICA'S WATERS 4, 10 (1998) [hereinafter EPA & USDA].
[54] EPA 1998, *supra* note 33, at iii.
[55] *Id.* at iii–v.
[56] *See* USGS, *supra* note 1, at 132.

century."[57] Given the structure and operation of the U.S. regulatory scheme for water pollution control, this situation, while clearly a disappointment, is not necessarily a surprise.

A. Aquatic Nutrient Pollution: The Reach and Limits of Federal Authority Under the CWA

The reach and regulatory authority of the CWA, the country's preeminent (and in many ways spectacularly successful) water quality statute, are actually quite limited when it comes to controlling nonpoint sources of nutrient pollution. The CWA is particularly limited with regard to agricultural nonpoint dischargers, who are the primary source of the nitrogen and phosphorous degrading U.S. waters.[58]

The CWA makes it illegal to discharge any pollutants from a point source into waters of the United States unless such a discharge is explicitly authorized through a NPDES permit, issued by the EPA or an EPA-authorized state.[59] However, it puts no such restrictions on the release of those same pollutants through runoff from nonpoint sources, such as the numerous and geographically ubiquitous agricultural and silvicultural operations.[60] In fact, the CWA explicitly exempts from its permitting requirements agricultural discharges that would otherwise fall under its definition of a point source and thereby be subject to the discharge restrictions of a NPDES permit.[61] While discharges from Concentrated Animal Feeding Operations ("CAFOs") are generally required to comply with the point source permitting requirements, the implementing regulations for such discharges leave enough loopholes to ensure that many CAFOs can legally operate without a NPDES permit, despite being one of the most significant contributors of nutrients and other pollutants to U.S. waters.[62]

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[57] ELPC, *supra* note 1, at 1; STATE-EPA NUTRIENT INNOVATIONS TASK GROUP, AN URGENT CALL TO ACTION: REPORT OF THE STATE-EPA NUTRIENT INNOVATIONS TASK GROUP 1 (2009) [hereinafter STATE-EPA NITG].

[58] STATE-EPA NITG, *supra* note 57, at 15, 17, 22.

[59] 33 U.S.C. §§ 1311(a)(1), 1342(b) (2006); *see also* Nat'l Assoc. of Home Builders v. Defenders of Wildlife, 551 U.S. 644, 649–55 (2007) (focusing on the conditions for the EPA's delegation of Section 402 permitting authority to the states).

[60] While the Act contains a definition for point sources, it contains no parallel definition for nonpoint sources. It is simply anything that does not meet the definition of a point source. *What is Nonpoint Source Pollution?*, ENVTL. PROT. AGENCY, http://water.epa.gov/polwaste/nps/whatis.cfm (last updated Aug. 27, 2012).

[61] For example, irrigation return flows are exempted. 33 U.S.C. §§ 1342(a)(1), 1362(14) (2006).

[62] ELPC, *supra* note 1, at 2 ("Discharges from Concentrated Animal Feeding Operations (CAFOs) are covered by the NPDES permit program . . . . In practice, this means that

The CWA's stated purpose is restoring and maintaining the nation's waters.[63] However, nonpoint sources, one of the two major categories of dischargers and the most significant contributor to nutrient pollution,[64] are effectively exempted from the NPDES discharge permitting program, and so from the key CWA approach of controlling the discharge of pollutants, regardless of the ambient consequences.

Nonpoint control is essentially left to the states. The CWA effectively directs them to manage NPS discharges on the basis of their ambient effects, in apparent disregard of the well-known problems with this type of regulatory strategy.[65] Further, most of the CWA provisions that deal with NPS pollution do not actually mandate any regulatory action by the states; rather, they aim to steer and incentivize the states' control of NPS discharges.[66] For example, Section 319 uses federal grants to encourage the states to step up their management/control of NPS pollution.[67] The only requirement is a procedural one for the preparation of state assessment reports,[68] and state management programs.[69] Section 208 is similarly weak in its expectations for utterly procedural state actions, such as

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manure from these facilities is applied to land, where stormwater runoff is exempt from regulation. Consequently, the largest contributors of nitrogen and phosphorus are scarcely regulated at the federal level and pollution problems continue to worsen.").

[63] *See* 33 U.S.C. § 1251(a) (2006).

[64] ELPC, *supra* note 1, at 1–2.

[65] *See* 33 U.S.C. §§ 1288, 1329 (2006). The CWA's statutory predecessors' strategy was ambient-based controls. The CWA intended to replace this strategy through the introduction of the NPDES program, which was subsequently very successful, and its reliance on technology-based, universally applied discharge controls. *See, e.g.*, Oliver Houck, *TMDLs, Are We There Yet?: The Long Road Toward Water Quality-Based Regulation Under the Clean Water Act*, 27 ENVTL. L. REV. 10391 (1997) [hereinafter *Are We There Yet?*]; Oliver Houck, *TMDLs: The Resurrection of Water Quality Standards-Based Regulation Under the Clean Water Act*, 27 ENVTL. L. REV. 10329, 10332 (1997); Oliver Houck, *TMDLs III: A New Framework for the Clean Water Act's Ambient Standards Program*, 28 ENVTL. L. REV. 10415, 10416–20 (1998) [hereinafter Houck 1998].

[66] *See, e.g.*, *Are We There Yet?*, *supra* note 65, at 10391; Kelly Seaburg, *Murky Waters: Courts Should Hold That the "Any-Progress-Is-Sufficient-Progress" Approach to TMDL Development under Section 303(d) of the Clean Water Act Is Arbitrary and Capricious*, 82 WASH. L. REV. 767, 769–70 (2007); Zaring, *supra* note 14, at 521, 523–24.

[67] 33 U.S.C. § 1329(h) (2006).

[68] These reports identify waters that cannot meet state water quality standards without further control of nonpoint sources, and also identify the nonpoint sources responsible for such impairment of water quality. *See* 33 U.S.C. § 1329(a) (2006).

[69] State management programs should point to appropriate Best Management Practices for nonpoint control, identify programs that can help implement the BMPs, and provide a schedule of annual implementation milestones. *See* 33 U.S.C. § 1329(b) (2006).

development of "areawide waste treatment management plans," in return for federal money.[70]

Even where the CWA provides some mandates for state NPS control, such as in Section 303, the CWA's provisions are insufficient to ensure practical water quality results. Specifically, Section 303 of the CWA requires states to develop and implement water quality standards that specify the desired uses for each of a state's water bodies, and stipulate the levels of water quality necessary to support these uses.[71] These standards serve as a broad parameter guiding states' ambient-based regulation of NPS discharges, and the EPA has the authority to review and approve state standards.[72] The EPA also has the authority to set standards for states who fail to do an adequate job of following the relevant CWA mandates.[73]

For waters that cannot attain water quality standards due to excess of a particular pollutant or pollutants (also known as impaired waters, 303(d) waters, or water quality limited segments), states are required to develop and implement TMDLs for the offending pollutants.[74] States are required to put impaired waters on a "pollution diet" by capping the total amount of pollutants allowed to enter such waters, then tightening discharge restrictions on point and nonpoint sources to ensure that the combined total discharges of the offending pollutants do not exceed the TMDL.[75]

The very applicability of TMDL restrictions to nonpoint sources, now well-established,[76] has been strongly contested by the agricultural and silvicultural industries.[77] But as the TMDL experience to date indicates, *applicability* and *application* are two rather different things.

As with the development of state water quality standards, the CWA provides some federal authority in the development of TMDLs for impaired waters, whether they are impaired by point or nonpoint source pollution.[78] It calls on the EPA to step in and develop TMDLs for states who have failed to come up with appropriate TMDLs, or failed to come

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[70] 33 U.S.C. § 1288.
[71] *Id.* §§ 1313(a)–(c)(2)(A); *see also id.* § 1313(d)(4)(B) (2006); 40 C.F.R. § 131.12–13 (2012).
[72] 33 U.S.C. §§ 1313(a)(3)(B)–(C) (2006).
[73] *Id.* § 1313(b).
[74] If this offending pollutant has been identified by the EPA as one for which a TMDL should be developed. *Id.* §§ 1313(d)–(e); 40 C.F.R. § 130.2(e) (2012).
[75] *See* Pronsolino v. Nastri, 291 F.3d 1123, 1137 (9th Cir. 2002).
[76] *Id.* at 1139.
[77] *See, e.g.*, Houck 2002, *supra* note 13, at 10386.
[78] *See Pronsolino*, 291 F.3d at 1127–28, 1132, 1137.

up with any TMDLs at all, although what constitutes a federally correctable state failure of 303(d) duties is still contested legal territory.[79]

However, when it comes to the actual implementation and enforcement of these TMDLs in waters afflicted by NPS pollution, the reach of federal authority and the CWA is extremely limited.[80] The authority to control NPS discharges to impaired waters lies squarely and solely with the states.[81] However, the states, being keenly aware of agricultural and silvicultural opposition to anything that even raises the possibility of binding regulatory controls on their practices and discharges, have proven reluctant regulators.[82] Indeed, the state's overall accomplishments in addressing nonpoint sources of water pollution and water quality impairment have also been described as an "abject failure,"[83] an apparently fitting characterization considering that year after year, nonpoint pollution and agricultural sources top the list of culprits for water quality impairment.[84]

Whatever federal authority to intervene in TMDL implementation does exist comes through the CWA's NPDES program.[85] Given that

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[79] *See* Seaburg, *supra* note 66, at 791.

[80] Dianne Conway gives a stark and still relevant characterization that "[t]he greatest limitation on TMDL implementation is the fact that, under the Clean Water Act, the Federal government has no authority to implement or enforce nonpoint source pollution controls." Diane Conway, *TMDL Litigation: So Now What?*, 17 VA. ENVTL. L.J. 83, 114 (1997). Therefore, "even if a TMDL is established which sets specific limits on a nonpoint source of pollution, the EPA is powerless to enforce it and must rely on the state's good faith." *Id.*; *see also* Robert Adler, *CPR Perspective: Nonpoint Source Reform*, CENTER FOR PROGRESSIVE REFORM, http://www.progressivereform.org/perspTMDLs.cfm (last visited Apr. 2, 2013); Yee Huang, *Here Come the TMDLs?*, CPRBLOG (Mar. 30, 2009), http://www.progressivereform.org/CPRBlog.cfm?idBlog=53EE7FB2-1E0B-E803-CA142D0C7D406F21.

[81] *See Pronsolino*, 291 F.3d at 1140.

[82] *See infra* notes 92–114 and accompanying text; *see also* Houck 2002, *supra* note 13, at 10386.

[83] Roger Flynn, *New Life for Impaired Waters: Realizing the Goal to "Restore" the Nation's Waters Under the Clean Water Act*, 10 WYO. L. REV. 35, 47 (2010) (quoting Eric E. Huber, *TMDLs: White Knight or Bureaucratic Nightmare*, 4 VT. J. ENVTL. L. 1, 14 (2003)).

[84] *Nonpoint Source Pollution Control: Breaking the Regulatory Stalemate*, ENVTL. DEFENSE, http://www.envtn.org/uploads/GTLP-PNG.PDF (last visited Apr. 2, 2013).

[85] Some point source discharges are federally permitted. *See* OFFICE OF WASTEWATER MANAGEMENT, ENVTL. PROT. AGENCY, WATER PERMITTING 101 (n.d.), *available at* http://www.epa.gov/npdes/pubs/101pape.pdf. Whether a point source is permitted by the EPA or a delegated state, the EPA has the authority to review its NPDES permit, and to refuse approval where the discharges allowed under a permit do not comply with the relevant TMDL. *Id.* For states refusing to comply with TMDL limits on point sources, EPA can also revoke a state's NPDES program. *See id.*

program's exclusive focus on point source discharges,[86] such federal authority—even if used to its fullest—is obviously limited in its practical reach and capacity to advance water quality improvements and the recovery of impaired waters. These limitations are vividly illustrated by the past experience and ongoing struggles of the Chesapeake Bay against nutrient and sediment pollution, much of which comes from agricultural and other nonpoint discharges.[87]

Even the most recent extension of federal leverage over TMDL implementation, which was conferred by the Ninth Circuit's *Friends of Pinto Creek* decision,[88] still leaves the federal reach over NPS discharges in impaired waters patently indirect. Further, it is contingent on the occurrence of specific practical circumstances (i.e., the need for new point source discharges and so new NPDES permits in waters significantly impaired by nonpoint runoff), and its outcome is ultimately dependent on a state's choices and priorities in handling these circumstances.[89] Most

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[86] *See National Pollutant Discharge Elimination System Compliance Monitoring*, ENVTL. PROT. AGENCY, http://www.epa.gov/compliance/monitoring/programs/cwa/npdes.html (last updated June 13, 2012).

[87] *See* ENVTL. PROT. AGENCY, THE NEXT GENERATION OF TOOLS AND ACTIONS TO RESTORE WATER QUALITY IN THE CHESAPEAKE BAY: A REVISED REPORT FULFILLING SECTION 202A OF EXECUTIVE ORDER 13508 (2009); *see also* EWG, *supra* note 15, at 7; Houck 2011, *supra* note 13, at 10213; Karl Blankenship, *Congress, Farm Community Say EPA Overreached with TMDL*, BAY J. (Apr. 2011), http://www.bayjournal.com/article/congress_farm_community_say_epa_overreached_with_tmdl; Karl Blankenship, *Public, in Comments, Weighs Pros and Cons of TMDL for Bay*, BAY J. (Dec. 2010) http://www.bayjournal.com/article/public_in_comments_weighs_pros_and_cons_of_tmdl_for_bay; Tom Pelton, *"Voluntary, Collaborative" Bay Cleanup Is Failing. A Call for Stronger Action and Regulation*, BAY DAILY (June 2, 2010), http://cbf.typepad.com/bay_daily/2010/06/the-leaders-of-chesapeakebay-region-governmentsare-holding-an-annual-meetingtomorrow-in-baltimore-with-epa-officials-and-i.html; *EPA, Agriculture Community Talk Bay Cleanup Plan*, WASH. TIMES (Aug. 14, 2009), http://www.washingtontimes.com/news/2009/aug/14/epa-agriculture-community-talk-bay-cleanup-plan/.

[88] Friends of Pinto Creek v. U.S. Envtl. Prot. Agency, 504 F.3d 1007 (9th Cir. 2007), *cert denied* 129 S.Ct. 896.

[89] *Friends of Pinto Creek* addresses the conditions for permitting new point source discharges of pollutants into waters already impaired by pollutants. The Ninth Circuit reviewed a claim that the EPA had violated the CWA and applicable regulations (specifically, 40 C.F.R. § 122.4(i)) by issuing a NPDES permit to a new discharger of copper into a copper-impaired stream that already exceeded the amount of dissolved copper allowed under the Section 303(d) Water Quality Standard. *Friends of Pinto Creek*, 504 F.3d at 1009. The Ninth Circuit found that the EPA was indeed in violation, ruling that before a new NPDES permit can be issued for a discharge into an impaired body of water, that body of water must have an appropriate TMDL. *Id.* at 1015–16. The TMDL must have adequate load allocations and credible compliance schedules that guarantee the attainment

important for the present discussion, the *Friends of Pinto Creek* ruling states that ". . . EPA has the responsibility to regulate discharges from point sources and the states have the responsibility to limit pollution coming into the waters from nonpoint sources,"[90] and stipulates that if discharge restrictions and compliance schedules for point sources alone are insufficient to ensure the attainment of water quality standards, "*then a [new NPDES] permit cannot be issued unless the state or [the discharge permit applicant] agrees to establish a schedule to limit pollution from a nonpoint source or sources sufficient to achieve water quality standards.*"[91]

The *Friends of Pinto Creek* ruling means that in waters primarily impaired by NPS discharges, the capacity to permit new point sources of the impairing pollutants will be contingent on a state's implementation of NPS discharge controls. Licensing of a new point source would also require compliance schedules that plausibly promise the attainment of water quality standards. The *Friends of Pinto Creek* ruling thus opens up a possibility that at least in some cases, states overseeing TMDLs for impaired waters would have a compelling enough reason to implement actual regulatory controls on NPS discharges to those waters, if locating a new point source on these waters is an important enough priority.

In sum, the actual practical capacity to control NPS discharges of pollutants, including nutrient pollutants, into U.S. waters lies outside the scope of federal authority and the statutory reach of the CWA, and in the statutory and regulatory hands of the states.

B. What the States Are Doing—and Not Doing—to Regulate Nonpoint Nutrient Discharges from Agriculture

States have proven reluctant regulators. This is particularly so when it comes to imposing any binding controls and performance expectations on the powerful and vocal constituency of agricultural (nonpoint) dischargers, a constituency well-used to virtual immunity from most environmental regulations.[92] Even states with more comprehensive, binding

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of water quality standards and ensure the capacity to accommodate new point source discharges without causing or contributing to the violation of these standards. *Id.*

[90] *Id.* at 1014.

[91] *Id.* at 1014 (emphasis added).

[92] *See* Zaring, *supra* note 14, at 524 (noting that "[s]tates were unwilling to provoke powerful agricultural constituencies with strict regulation when the Federal Government did not obligate them to do so"); *see also* ELPC, *supra* note 1, at 4 (discussing how state regulation and enforcement of nutrient discharge controls is significantly impeded by political

controls on agricultural runoffs, such as California, are still experiencing the same political pressures of the regulated community and holding back on enforcement.[93]

With agriculture as the primary contributor of nutrient enrichment in U.S. waters, this combination of state-vested authority and state regulatory reluctance is particularly consequential. To put it in the words of the recent Environmental Law and Policy Center review of state-based regulation of agricultural nonpoint pollution, "[n]onpoint source pollution is the greatest threat to water quality in the United States, yet neither states nor the federal government has [sic] taken adequate steps to defuse that threat."[94]

The federal failure can be largely characterized as a failure to legislate, best exemplified by the failure of the CWA to provide for sufficient federal regulatory authority over nonpoint discharges and dischargers.[95] The failure of the states is most often a failure to exercise available regulatory authorities to control nonpoint discharges, most notably those from agriculture.[96]

If states are arranged along a regulatory continuum based on their control of agricultural nonpoint discharges, few will fit at either extreme.[97] There are no states without any relevant authority for controlling agricultural nonpoint discharges,[98] and with absolutely no provisions for the control of such discharges; even the weakest regulators have some voluntary BMPs and the authorities and guidance of CWA Sections 208 and 319.[99]

But neither are there states that truly fit at the "good" end of the nonpoint regulatory continuum: states with agricultural runoff controls that are binding and comprehensive, well-tailored to the specifics of regulated dischargers and discharges, properly implemented, and diligently enforced, including compliance monitoring and credible consequences for non-compliance.

A few states, like California, come close to the "good end" of the nonpoint regulatory continuum, but still notably miss the mark. The rest

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resistance to the idea of regulating agriculture); Houck 2002, *supra* note 13, at 10386; Ruhl, *supra* note 13, at 267–68.

[93] ELPC, *supra* note 1, at 9–11.

[94] ELPC, *supra* note 1, at 3.

[95] *See supra* notes 79–91 and accompanying text.

[96] *See* Zaring, *supra* note 14, at 524; ELPC, *supra* note 1, at 4.

[97] *See* ELI 1997, *supra* note 14, at i.

[98] *Id.*

[99] *Id.* at i–iv.

are arrayed along the continuum in various clusters of regulatory deficiency, from the insufficiently comprehensive and insufficiently binding to the truly spotty in coverage and optional in application. This is true even when all available authorities for controlling nonpoint nutrient discharges are accounted for, rather than just dedicated agriculture or nonpoint-specific statutory and regulatory provisions.

California, for example, has binding, comprehensive, and enforceable regulatory controls on agricultural nonpoint discharges. Under the Porter-Cologne Water Quality Control Act of 1969, the state water pollution control statute, "[a]ll discharges of waste into the waters of the State are privileges, not rights."[100] Nonpoint sources are required to have permits issued by the Regional Water Quality Control Boards ("RWQCBs") designed to ensure attainment of regional and state water quality goals set by the State Water Resources Control Board and RWQCBs.[101] Compliance monitoring in California is limited, however, as "a significant number of dischargers are not yet aware of their obligation to comply with the California program,"[102] and the RWQCBs focus their enforcement efforts on those agricultural nonpoint sources who are clearly creating water quality problems.[103]

Another example of a state closer to the "good" than the "negligent/deficient" end of the NPS regulatory continuum is Delaware. Delaware has a set of reasonably comprehensive and binding agricultural NPS controls, which take the form of requirements for agricultural operations above a certain size to develop and implement a nutrient management plan.[104] However, implementation and enforcement by the Delaware Nutrient Management Commission are not exactly diligent and rigorous. In 2008, for example, "the Commission received less than half of the annual reports required of each person with a nutrient management plan."[105]

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[100] CAL. WATER CODE § 13263(g). California NPS dischargers are also required to develop and implement NPS plans, which are individual or group plans designed to ensure the permitted dischargers meet water quality objectives. *See* ELPC, *supra* note 1, at 12–15. Regional Water Quality Control Boards are also responsible for reviewing and approving the plans, and for carrying the authority to enforce compliance with the plans and permit conditions. *Id.* at 15.

[101] ELPC, *supra* note 1, at 12.

[102] *Id.* at 13.

[103] *Id.* at 14.

[104] Such controls apply to operations with eight or more livestock, or ten or more acres of nutrient-applied land. 3 DEL. CODE § 2247(a)); *see also* ELPC, *supra* note 1, at 17–18.

[105] ELPC, *supra* note 1, at 17 (citing DEL. NUTRIENT MGMT. COMM'N, ANN. REP. 2008 3 (2009), *available at* http://www.dda.delaware.gov/nutrients/forms/2008/NM_2008%20Annual%20Report%20-%20Final.pdf).

The Commission normally pursues three or four violations, tending to resolve these informally, rather than applying the potentially substantial penalties provided under the state's nutrient management program.[106]

Some states, like North Carolina, mandate the use of particular BMPs by agricultural operations adjacent to particular state waters.[107] However, the practical pollution control value of these geographically limited controls is further weakened by broad exemptions.[108] Others, like Georgia, impose seemingly broadly applicable NPS BMPs like stream buffer requirements, but then explicitly exempt agriculture and forestry from these requirements.[109]

And a number of states require setbacks for the land application of waste and manure.[110] Some state requirements are stricter in the formulation of their setback rules and more comprehensive when defining the population of agricultural operations to which these rules apply.[111] Arkansas's requirements, for example, are stricter than Illinois's.[112]

In many states—including states with no binding regulations over NPS discharges—general water quality statutes still give the various state agencies the authority to control polluting agricultural runoff.[113] However, such authorities are seldom exercised.[114]

The upshot—no state-level regulations are controlling NPS discharges in a way that is simultaneously comprehensive, binding, enforceable, and enforced. Even states like California, who have reasonably comprehensive and binding regulations, choose not to enforce such regulations.

C. The Present Regulatory Predicament and the Way Ahead

So this is the dedicated regulatory regime we currently have for controlling nonpoint origin aquatic nutrient pollution—a combination of federal CWA authority that is indirect and severely limited,[115] and an

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[106] ELPC, *supra* note 1, at 18.
[107] *Id.* at 37.
[108] *Id.* at 38.
[109] *See id.* at 67 n.242.
[110] *Id.* at 40–45.
[111] ELPC, *supra* note 1, at 40–45.
[112] *Id.*
[113] ELI 1997, *supra* note 14, at i–ii.
[114] *Id.* at ii; ELI 1998, *supra* note 14, at 3; ELI 2000, *supra* note 14, at 140.
[115] *See supra* Part II.A.

array of state regulatory programs that range from the reasonably comprehensive but poorly implemented and generally unenforced to the genuinely patchy and deficient.[116]

Unsurprisingly, then, the recent State-EPA Nutrient Innovations Task Group ("Task Group") concluded that aquatic nutrient pollution is a huge problem and likely getting worse.[117] The Task Group emphasized that things are not going to get any better unless NPS nutrient discharges are finally properly controlled.[118] In fact, the Task Group warns that without NPS controls, things are likely to get worse, since regulated point sources are increasingly chafing at bearing a disproportionate share of the pollution control burden.[119]

But how are the long-elusive improvements in nonpoint pollution control to be finally achieved? The Task Group calls for "[f]ully using the tools we have," meaning the full deployment of existing statutory and regulatory authorities, as well as "[e]xploring new authorities that we need."[120]

Yet, stronger new statutes—federal or state—are notoriously hard to come by, and the history of state NPS regulation points to clear and long-standing reluctance to really fully use the tools we have.[121] Many states may well want to do better in controlling nonpoint pollution, nutrient and otherwise, but not at the cost of angering or alienating agricultural constituencies, which are largely unwilling to entertain binding and enforceable controls. More stringent state regulation would be a particularly hard sell if the negative effects of agricultural origin nutrient enrichment on prized recreational and commercial uses are mainly felt by other states downstream.

At the same time, past experience clearly suggests that in a Venn diagram of NPS regulatory controls, there is insufficient overlap between the voluntary—as in the fairly ubiquitous voluntary BMPs for agriculture—and the effective—as in regulatory requirements that consistently produce practical water quality results.[122] This is not because most agricultural operators are unwilling to abide by voluntary BMPs—to the contrary, many operations across numerous states are implementing useful BMPs.[123] It

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[116] *See supra* Part II.B.
[117] STATE-EPA NITG, *supra* note 57, at 33–34.
[118] *Id.* at 33.
[119] *Id.*
[120] *Id.* at 34.
[121] *See* ELI 2000, *supra* note 14, at 140.
[122] *See* STATE-EPA NITG, *supra* note 57, at 31; ELPC, *supra* note 1, at 2; EWG, *supra* note 15, at 1–2; *see also* Adler, *supra* note 14.
[123] *See* Adler, *supra* note 14, at 83–84.

is because enough large operators with significant discharges are unwilling to do so, offsetting the pollution control and water quality gains made by good-faith agricultural actors,[124] and successful controls on NPS pollution.[125] Ultimately, when runoff management is done on a voluntary basis, there is a limit to what operations who volunteer to protect water quality can implement while staying within the margins of the affordable and cost-efficient—even with federal and state cost shares and conservation grants.[126]

It seems overwhelmingly clear, then, that most states need an extra incentive beyond the apparently insufficient sticks and carrots provided in the CWA to step up the control of NPS discharges. That is, most states could use a nudge to at least fully use the tools they do have—tools that, between the CWA TMDL program and existing state authorities over nonpoint discharges,[127] would go a long way towards improving on the current water quality and nutrient enrichment situation.

Incentives generated through the strategic leveraging of the ESA, and especially the harm and take prohibitions of ESA Section 9 might just fit the bill. Such strategic leveraging could help change the regulatory calculus of the agricultural community, making it more amenable to the prospect of state regulatory controls that are even-handed in their application and well-tailored in design.

I next turn to the details of such leveraging and its benefits for addressing the regulatory and ecological predicament of nonpoint nutrient pollution. It is critical to note, however, that although this analysis seeks to strategically use the presence of threatened and endangered species and the strong protections that ESA Section 9 provides for such species as a way to improve on the persistent predicament of aquatic nutrient enrichment, it does not propose to turn the ESA into a direct instrument of water pollution control. Rather, it seeks to explore whether the strong provisions and protections of the ESA can be deployed in ways that would reduce the resistance of the agricultural community and other NPS sources to binding and comprehensive state controls on NPS nutrient discharges, or jolt into regulatory action the state agencies with authority over NPS discharges.

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[124] *See id.*

[125] *See Are We There Yet?*, *supra* note 65, at 10397–10401; Houck 1998, *supra* note 65, at 10435–38.

[126] *See, e.g.*, Mark B. David et al., *Tile Drainage Directly Related to Nitrate Loss*, SCI. NEWSLINE (Sept. 27, 2010), http://www.sciencenewsline.com/articles/2010092712000042.html.

[127] *See generally* ELI 1997, *supra* note 14; ELI 1998, *supra* note 14; ELI 2000, *supra* note 14.

III. THE ENDANGERED SPECIES ACT: A BRIEF OVERVIEW

The ambitious goal of the Endangered Species Act is to "provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved" and "to provide a program for the conservation of such endangered species and threatened species."[128] The triggering of the statute's considerable conservation powers is contingent upon the presence of a species in peril. The peril can come in the form of overharvesting, habitat destruction, disease or predation, the inadequacy of existing regulatory mechanisms, or other natural and manmade factors.[129] In order for an imperiled species to benefit from the statute's protections and trigger its conservation powers, it has to be listed as threatened or endangered.[130] The listing is done by the Fish and Wildlife Service ("FWS") or the National Marine Fisheries Services ("NMFS"), who have the responsibility for implementing the statute.[131] The listing criteria and definitions are specified in Section 4 of the ESA.[132]

Once a species has been listed as threatened or endangered, it gets considerable protections under Sections 7 and 9 of the ESA. Section 7 requires each federal agency, in consultation with the FWS or NMFS, to ensure that its actions do not jeopardize the continued existence of threatened or endangered species or adversely modify the designated critical habitat of such species.[133] While the Section 7 protections only apply in cases where listed species threats are created through some sort of a

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[128] 16 U.S.C. § 1531(b) (2006).

[129] *Id.* § 1533.

[130] An endangered species is defined in the ESA as

> any species which is in danger of extinction throughout all or a significant portion of its range other than a species of the Class Insecta determined by the Secretary to constitute a pest whose protection under the provisions of this chapter would present an overwhelming and overriding risk to man.

16 U.S.C. § 1532(6) (2006). A threatened species is defined as "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. *Id.* § 1532(20).

[131] The ESA names the Secretaries of the Interior and Commerce as responsible for implementing the statute. *Id.* § 1532(15) (2006). The Secretaries have delegated these implementation duties to the FWS and the NMFS, respectively. U.S. GOV'T ACCOUNTABILITY OFFICE, U.S. FISH AND WILDLIFE SERVICE: ENDANGERED SPECIES ACT DECISION MAKING 1 n.1 (2008).

[132] 16 U.S.C. § 1533 (2006).

[133] *Id.* § 1536(a).

federal agency action, whether direct or regulatory/permitting, they cover all listed species alike—threatened and endangered, plant and wildlife.[134]

Section 9 prohibits the take of endangered species of fish and wildlife,[135] and FWS regulations have extended this take prohibition to most threatened species.[136] The take prohibition applies to the actions of private individuals and businesses as well as those of government agencies and employees.[137] It has potentially far-reaching practical consequences given the broad definition of prohibited take.[138] The definition encompasses the possibility of take through habitat modification, opening up the possibility for numerous actions, including many otherwise ordinary land uses, to result in prohibited take.

Finally, the ESA provides for the possibility of some limited exemptions from the categorical take prohibition of Section 9. It authorizes FWS and NMFS to issue an Incidental Take Statement ("ITS") during a Section 7 consultation with federal agencies.[139] The ITS effectively permits some limited and conditional take resulting from the actions of federal agencies, or their permittees, where the Section 7 consultation was conducted apropos permitting action with potential effects on listed species.[140]

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[134] *Id.* § 1536(a). Section 7 also establishes affirmative duties for species protection, by asking federal agencies to "utilize their authorities in furtherance of the purpose of [the ESA] by carrying out programs for the conservation of endangered species and threatened species."

[135] *Id.* § 1538(a). It is critical for the purposes of the current analysis, however, to note that the "take" prohibition of Section 9 does not generally apply to listed plants. The ESA makes the taking of listed plants on private land unlawful only if it is already prohibited under state species protection laws or regulations. *See id.* § 1538(a)(2)(B). Section 9 of the ESA is intended to help enforce state plant protection laws, but does not itself provide equivalent protection for plants. Plants are, on the other hand, treated the same as fish and wildlife under Section 7 of the ESA. *See id.* § 1536.

[136] 50 C.F.R. § 17.31(a) (2011). The NMFS stipulates protections for threatened species under its jurisdiction on a case-by-case basis. *See id.* § 223.201–11 (2011). Both agencies' authority to extend further protections to threatened species stems from Section 4 of the ESA. 16 U.S.C. § 1533 (2006).

[137] 16 U.S.C. §§ 1532(b), 1538(a) (2006).

[138] The statute defines a "take" of listed wildlife to mean harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting such wildlife, and/or attempting to engage in such conduct. *Id.* § 1532(19). The FWS regulations interpret the term broadly, noting that "[h]arm in the definition of 'take' in the [Endangered Species] Act means an act which actually kills or injures wildlife. Such acts may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavior patterns, including breeding, feeding or sheltering." 50 C.F.R. § 17.3 (2011).

[139] 16 U.S.C. § 1536 (2006).

[140] *Id.*

The FWS or NMFS can issue an ITS as long as neither the take nor the agency action causing the take will jeopardize the continued existence of the affected species or adversely modify its critical habitat.[141]

Section 10, introduced as part of the 1982 ESA amendments, provides another pathway for obtaining a permit for the limited take of listed wildlife in the course of otherwise lawful activities whose purpose is not the take of listed species. It requires the preparation of a conservation plan by the private and/or government actors whose activities are expected to produce such a take,[142] with the issuing of a take permit conditional on plan approval by the FWS or NMFS, who each have a fair amount of discretion to impose additional terms and conditions.[143]

IV. THE ESA—A WAY OUT OF THE REGULATORY AND ECOLOGICAL PREDICAMENT OF NONPOINT NUTRIENT POLLUTION?

Many of the imperiled aquatic species currently affected by nutrient pollution, including federally listed fish and wildlife, reached their threatened or endangered status as a result of habitat degradation and habitat loss, often driven by hydromodification.[144] More recently, however, pollution—particularly agricultural nutrient pollution—has risen to the top in the hierarchy of threats for imperiled aquatic species.[145]

The rest of this Article examines whether and how the Endangered Species Act can protect such species from the threat of nonpoint nutrient pollution. The ultimate goal of the analysis, however, is to see how the

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[141] *Id.*

[142] *See id.* § 1539(a)(1). Incidental take permits are essentially issued in exchange for preparing and funding the implementation of a conservation plan for the species affected by the proposed activity. Conservation plans must specify the likely species impact of the proposed incidental taking, the alternatives to the proposed take and reasons why the alternatives are not feasible, the steps that the applicant will take to minimize and mitigate the impacts resulting from his/her taking of listed wildlife, the funding that will be made available to take such mitigation steps, and any other measures that the FWS considers necessary. *Id.* § 1539(a)(2).

[143] For details on the implementation and implications of Section 10(a) incidental take and habitat conservation planning provisions, see CRAIG W. THOMAS, BUREAUCRATIC LANDSCAPES: INTERAGENCY COOPERATION AND THE PRESERVATION OF BIODIVERSITY 196–201 (2003); Karin P. Sheldon, *Habitat Conservation Planning: Addressing the Achilles Heel of the Endangered Species Act*, 6 N.Y.U. ENVTL. L.J. 279 (1998); John F. Turner & Jason C. Rylander, *Conserving Endangered Species on Private Lands*, 32 LAND & WATER L. REV. 571, 577–84 (1997); *see also* JUDITH LAYZER, NATURAL EXPERIMENTS: ECOSYSTEM-BASED MANAGEMENT AND THE ENVIRONMENT (2008).

[144] Richter et al., *supra* note 7, at 1082; Wilcove et al., *supra* note 11, at 608.

[145] Richter et al., *supra* note 7, at 1082; Wilcove et al., *supra* note 11, at 614.

nutrient pollution shield that the ESA may provide for listed species can be used to protect the wider basins and watersheds of which listed species are a part. The discussion below suggests that these questions can be answered in a hopeful affirmative.

The available data shows some significant negative effects of aquatic nutrient pollution on listed species, and also points to a likely plethora of unprocessed, poorly documented, and incompletely analyzed evidence of further such effects. It suggests that with some additional scientific research and some legal diligence, it is possible to find a number of aquatic species affected by nonpoint nutrient enrichment—specifically agricultural nonpoint enrichment—in ways that qualify as prohibited harm and take in violation of ESA Section 9, and that call for equitable relief.

Finally, the current situation of nonpoint nutrient pollution is such that any equitable relief obtained on behalf of listed species—relief that should come in the form of improved controls of nonpoint nutrient discharges—should often benefit aquatic ecosystems and environments beyond the immediate physical habitat of the nutrient-afflicted listed wildlife. That is, they will benefit water quality and aquatic environments more broadly, especially since agricultural and other nonpoint nutrients often travel a considerable distance. For example, nonpoint nutrient pollution is found as far south as the Gulf of Mexico, where a dead zone exists that is largely caused by nutrient runoff from row crop agriculture in the corn belt states up the Mississippi watershed.[146] Reductions made at the source to stop harm to listed species further downstream should benefit all parts of the aquatic ecosystem previously affected by the upstream runoff.

For the ESA to shield listed species and their wider ecosystems from nonpoint nutrient pollution, it is necessary to engage its provisions in ways that can produce improvements in the control and management of nonpoint nutrient runoff. The rest of this section outlines the key elements of such an engagement. The discussion begins with a brief analysis of the possible relevance of Section 7 in the broader endeavor of using the ESA as leverage for improving the control of nonpoint nutrient discharges.

The bulk of the analysis then seeks to determine how the limitations on harmful activities as set by Section 9 of the ESA can be best brought to bear on the agricultural activities and practices that cause aquatic nutrient pollution in the habitats of nutrient-sensitive listed

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[146] *See* EPA OIG, *supra* note 1, at 7; USGS, *supra* note 1, at 22; Mark B. David et al., *Sources of Nitrate Yields in the Mississippi River Basin*, 39 J. ENVTL. QUALITY 1657, 1657 (2010).

wildlife. It determines how these restrictions on harmful activities and the remedies that the ESA makes available to address harm can be mobilized to protect not only aquatic listed species, but also, and very importantly, the broader nutrient-afflicted basins and watersheds of which nutrient-afflicted listed wildlife is a part.

I begin by outlining key prerequisites for the successful triggering of Section 9 protections. Specifically, I discuss the elements of showing nutrient-caused harm and take of listed wildlife: what is necessary to demonstrate nutrient-caused harm sufficient to qualify as a violation of the harm and take prohibitions of Section 9, and to trigger the available ESA remedies for such harm. Then, I discuss the linking of such harm to nutrient enrichment from agricultural nonpoint sources of nutrient runoff.

Finally, I focus on the critical question of who can be held liable for agricultural origin nutrient harm, and the available ESA remedies in cases of such harm. I also focus on how the successful procurement of such remedies through strategically planned Section 9 litigation can alter the regulatory calculus of the regulated community and broader regulatory landscape of nonpoint pollution control in the United States.

A. Nonpoint Nutrient Pollution and the Jeopardy and Critical Habitat Provisions of Section 7

The requirements of the ESA Section 7 apply specifically to the actions, direct or regulatory/permitting, of federal agencies.[147] As discussed, federal authority over nonpoint discharges, as it exists under the CWA, is limited and indirect.[148] Still, there is federal (EPA) authority to oversee and approve or correct state water quality standards.[149] Given that state water quality standards form a critical foundation for the ambient-based control of nonpoint discharges envisioned by the CWA,[150] Section 7 has a potentially valuable, if auxiliary role in the larger strategic project of using the ESA to leverage stronger and more effective controls of nonpoint nutrient discharges.

Section 7 requires that

> [e]ach federal agency shall, in consultation with and with the assistance of the Secretary [of the Interior or Commerce],

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[147] *See* 16 U.S.C. § 1536(a) (2006).
[148] *See supra* Part II.A.
[149] *See id.*
[150] *See id.*

> insure that any action authorized, funded, or carried out by such agency (hereinafter in this section referred to as "agency action") is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of [critical] habitat of such species . . . , unless such agency has been granted an exception for such action [under 16 U.S.C. § 1536(h)].[151]

To jeopardize the continued existence of a listed species is to engage in an action that would be reasonably expected to directly or indirectly reduce the likelihood of a survival or recovery of a listed species in the wild.[152] An agency action is, in turn, considered destruction or adverse modification of critical habitat if it produces a "direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species."[153]

These Section 7 requirements apply only to discretionary agency actions, or actions where the acting agency has the authority to modify its action if modification were necessary to avoid jeopardy or critical habitat effects on listed species.[154] In the CWA context, EPA approval of state NPDES permitting programs that otherwise fulfill applicable CWA requirements has been recently declared by the Supreme Court to be a nondiscretionary federal action outside the reach of Section 7 jeopardy and consultation requirements.[155]

EPA review and approval of state water quality standards, on the other hand, calls for Section 7 compliance and a consultation with the relevant service where listed aquatic species are present in the area affected by such approval and the subsequent entry into force of the approved standard. The EPA conducts formal consultations where listed species are present in the waters covered by state standards under its review.[156]

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[151] 16 U.S.C. § 1536(a)(2) (2006).
[152] 50 C.F.R. § 402.02 (2011).
[153] *Id.*
[154] *See id.* § 402.03.
[155] Nat'l Ass'n of Home Builders v. Defenders of Wildlife, 551 U.S. 644, 671–73 (2007).
[156] *See* ENVTL. PROT. AGENCY, MEMORANDUM OF AGREEMENT BETWEEN THE ENVIRONMENTAL PROTECTION AGENCY, FISH AND WILDLIFE SERVICE AND NATIONAL MARINE FISHERIES SERVICE REGARDING ENHANCED COORDINATION UNDER THE CLEAN WATER ACT AND ENDANGERED SPECIES ACT 11 (2001), *available at* http://www.nmfs.noaa.gov/op/pds/documents/02/301/02-301-22.pdf.

The usual product of such formal consultations is a FWS or NMFS Biological Opinion, which "states the opinion of the Service [FWS or NMFS] as to whether or not the [proposed and reviewed] Federal action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat."[157]

Biological Opinions usually contain an ITS, which shields the federal agency, as well as any beneficiaries of its review and permitting activities such as state agencies responsible for setting water standards in this case, from Section 9 liability.[158] It does so in case the agency's otherwise lawful activities, direct or permitting, result in the limited and incidental take of listed wildlife.[159] These liability protections, however, are contingent on the agency's compliance with the terms and conditions of the ITS, which may include reasonable and prudent measures to minimize the impact of incidental take on the affected threatened or endangered species of wildlife.[160] They may also include the terms or conditions the federal agency, or the applicant for a federal agency permit or approval, must follow to implement those measures.[161]

If a state's water quality standards are approved by the EPA in consultation with the FWS or NMFS, then incidental harm and take of listed wildlife related to the standard itself, its content and substance, should be covered by the ITS of the Biological Opinion. The state standard-setting agency should be free from worry about running afoul of Section 9, assuming that the state's standard setting agency applies the standard modifications suggested by the EPA as a result of the consultation.

For the purposes of the present analysis, I largely set aside the question of the adequacy of state water quality standards when it comes to protecting listed aquatic species. That is, I leave out an in-depth discussion of how Section 7 requirements and the Section 7 process can best

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[157] 50 C.F.R. § 402.02 (2011). If the relevant Service makes a jeopardy or adverse modification finding, then it would usually propose reasonable and prudent alternatives that enable completion of the proposed federal action, direct or regulatory/permitting, while protecting the listed species or habitats affected by this action. *See id.* § 402.01(a).

[158] *See* U.S. FISH & WILDLIFE SERV. & NAT'L MARINE FISHERIES SERV., ENDANGERED SPECIES CONSULTATION HANDBOOK 2–12 (1998) [hereinafter HANDBOOK] *available at* http://www.fws.gov/endangered/esa-library/pdf/esa_section7_handbook.pdf.

[159] *See* Paul Weiland, *District Court Allows Action for ESA Violations to Proceed Regarding Naval Operations Off the Atlantic Coast*, ENDANGERED SPECIES LAW & POLICY (Dec. 28, 2012), http://www.endangeredspecieslawandpolicy.com/2012/12/articles/court-decisions/district-court-allows-action-for-esa-violations-to-proceed-regarding-naval-operations-off-the-atlantic-coast/.

[160] *See id.*

[161] *See* HANDBOOK, *supra* note 158, at 2–12.

be harnessed in the service of listed species protection and broader water quality improvement. Instead, I focus the analysis on the pressing water quality problems stemming from the states' shortfalls when it comes to ensuring the attainment of existing water quality standards through the implementation of proper discharge restrictions on both point and nonpoint sources. More specifically, I focus on the problem of widespread non-attainment of such standards due to lack of adequate discharge controls on nonpoint sources.

That being said, Section 7 requirements and the Section 7 process could potentially provide the EPA with a useful extra tool for prodding the states towards the adoption of the numeric nutrient standards that the EPA has long urged the states to put in place. The EPA could use any extra leverage it can get on this front. It is currently facing a potential flurry of CWA lawsuits seeking to make the agency develop and adopt numeric nutrient standards for the many states who are not doing so themselves.[162] Getting into such standard development will further overstretch the EPA by adding to its substantial workload, and exposing it to a whole new realm of potentially protracted litigation, a prospect that the EPA has just gotten a taste of with its promulgation of numeric nutrient standards for Florida.[163]

B. Agricultural Nutrient Pollution as a Prohibited Take?

Nutrient pollution is causing problems for a number of species around the country. Currently, nutrient-driven anoxic and hypoxic conditions, significantly traceable to nonpoint sources, are causing increased juvenile mortality and interfering with reproduction of the endangered shortnose sturgeon.[164] Vegetation changes in parts of the Florida Everglades, appreciably driven by agricultural nutrient enrichment, are also causing growing foraging difficulties for the Everglade snail kite.[165] Its ability to find apple snail prey is impeded by low visibility in the thickening stands of introduced and native invasive plants.[166] Nonpoint nutrient pollution, including pollution from agricultural and silvicultural sources, is listed by the FWS as the critical contemporary

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[162] *See* MacCurdy, *supra* note 19.
[163] *See* Florida Wildlife Fed'n v. S. Florida Water Mgmt. Dist., 647 F.3d 1296, 1299–1300 (11th Cir. 2011); Florida Wildlife Fed'n v. Jackson, 853 F. Supp.2d 1138 (N.D. Fla. 2012).
[164] *See* Campbell & Goodman, *supra* note 8, at 772.
[165] *See* U.S. FISH & WILDLIFE SERV., *supra* note 5, at 4-294 to 4-295.
[166] *Id*.

threat to surviving populations of several freshwater snails in the Mobile River Basin, a global hotspot for freshwater biodiversity.[167] Research based on surveys of wildlife professionals, indicates that a quarter of imperiled aquatic species are negatively affected by altered nutrient inputs.[168] Further research which quantifies threats to imperiled species in the United States confirms these results.[169]

Threatened and endangered species are, in other words, undoubtedly suffering the various ecological consequences of aquatic nutrient enrichment. Much of it is attributable to runoff from nonpoint sources—especially agricultural nonpoint sources. But are the effects of nutrient enrichment on listed wildlife sufficiently serious to qualify as prohibited harm and take under Section 9 of the ESA?

Section 9 prohibits the taking of any endangered species of fish and wildlife,[170] regardless of whether they are found on public or private lands. The FWS has also passed regulations that extend this prohibition, and so the Section 9 protections, to threatened species.[171] Importantly, the take prohibition applies to the actions of private individuals and businesses as well as those of government agencies and employees.[172] Important to the present discussion, the "take" prohibition does not generally apply to listed plants.[173]

Given that plants are largely excluded from the critical protections offered by Section 9, the focus here is on the impacts of nutrient pollution on listed wildlife, and the implications of such impacts for the possibility of a broader regulatory leveraging of Section 9 provisions.

As to the nature and implications of these critical protections: the statute defines prohibited take of listed wildlife to include harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting such wildlife, or attempting to engage in any such conduct.[174] Regulations further define "harm," the part of the "take" prohibition most relevant to the present analysis, to mean "an act which

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[167] *See* U.S. FISH & WILDLIFE SERV., *supra* note 10, at 68.
[168] *See* Richter et al., *supra* note 7, at 1086.
[169] Wilcove et al., *supra* note 11, at 611–12.
[170] 16 U.S.C. § 1538(a) (2006).
[171] 50 C.F.R. § 17.31(a) (2011). The NMFS, on the other hand, stipulates protections for the threatened species under its jurisdiction on a case-by-case basis. *See id.* §§ 223.201–11 (2011). Both agencies' authority to extend further protections to threatened species stems from section 4(d) of the ESA. 16 U.S.C. § 1533(d) (2006).
[172] 16 U.S.C. §§ 1532(13), 1538(a)(1)(B) (2006).
[173] *Id.* § 1538(a)(2)(B).
[174] *Id.* § 1532(19) (2006).

actually kills or injures wildlife. Such act[s] *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."[175]

What we know seems to strongly suggest that nutrient enrichment, much of which is traceable to agricultural nutrient runoff,[176] is indeed affecting the shortnose sturgeon and the snail kite in ways that can be readily described as prohibited harm and take. But for many other species of listed wildlife who are negatively affected by nonpoint nutrient pollution, species like the freshwater snails of the Mobile River Basin, the available data, or simply just the available documentation, in terms of published peer-reviewed or gray literature data, may not be sufficient to make a Section 9 case. Indeed, many of the same scientific and technical sources which point to the negative effects of aquatic nutrient pollution on listed species also reveal that, in many cases of imperiled aquatic fauna, the published readily available data on the magnitude and specific consequences of different threats lacks in resolution, precision, or detail.[177]

Furthermore, when considering the increased judicial scrutiny of harm and take allegations that has followed the Supreme Court's *Babbitt v. Sweet Home Chapter of Communities for a Great Oregon* ruling,[178] even the more ecologically clear-cut cases like those of the shortnose sturgeon and snail kite—both of which meet an ecological standard for harm—may require considerable effort and some legal ingenuity to meet the judicial standard for harm in ways that would persuade a court to decide that a take had occurred.

At the same time, what we do know about threats to aquatic biodiversity points to a number of likely cases for nonpoint origin nutrient

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[175] 50 C.F.R. § 17.3 (2010) (emphasis added). Also potentially relevant to the current analysis is the definition of "harassing," but this analysis focuses on harm, as harm is the more encompassing and more fitting statutory category for the types of species harm caused by remote origin nutrient-pollution.

[176] *See* Robert Diaz & Rutger Rosenberg, *Spreading Dead Zones and Consequences for Marine Ecosystems*, 321 SCIENCE 926, 926 (2008).

[177] Wilcove et al., *supra* note 11, at 608–09; Richter et al., *supra* note 7, at 1082–85. This is different than the issue of biological versus legal standards for harm. That issue can be significantly misaligned with the most restrictive legal interpretations of the harm-take standard, as it calls for levels of proof and evidentiary detail that cannot be satisfied by the levels of certainty and proof normally attainable in ecological research. *See* Tzankova et al., *supra* note 28, at 448–49.

[178] Babbitt v. Sweet Home Chapter of Cmtys. for a Great Oregon, 515 U.S. 687, 708 (1995); *see* Holly Doremus, *Water, Population Growth, and Endangered Species in the West*, 72 U. COLO. L. REV. 361, 389–90 (2001).

harm to listed aquatic and aquatic-dependent wildlife.[179] However, before they could be taken up, these cases would need more precise description and quantification, and await more scientific and legal attention.[180]

ENGOs attempting the strategy suggested in this analysis and filing harm and take cases on behalf of nutrient-afflicted threatened and endangered wildlife will likely have to navigate the fraught legal terrain of showing harm through habitat modification, a terrain that remains quite contested even after the *Sweet Home* clarifications. The *Sweet Home* decision dealt with a direct challenge to the idea that habitat modification can constitute a prohibited take, affirming this idea in a 6–3 decision.[181] But the *Sweet Home* decision also goes further, to discuss the parameters for distinguishing between the kinds of habitat modification that qualify as harm to protected wildlife and those that do not.[182]

Recognizing the complexities of ecological causation, the Court left the specifics of distinguishing between "simple" habitat modification and harmful habitat modification to the lower courts,[183] thus leaving ample room for practical contestation in each new case.

So what is necessary for demonstrating that agricultural or other nonpoint origin nutrient pollution is harming listed wildlife in ways that qualify as prohibited take? What would it take to persuade post–*Sweet Home* courts that nonpoint nutrient pollution is violating Section 9 of the ESA in ways that merit equitable relief?

To survive legal contestation, a claim of agricultural origin nutrient harm should address the "three elements for harm,"[184] and ideally, address them in a way that comes as close as possible to meeting the standards of evidence and proof set by conservative interpreters of the *Sweet Home* decision.[185] A case for agricultural-origin nutrient harm and take of listed wildlife should, at its most thorough and challenge-proof, aim to demonstrate that agricultural nutrient runoff is (1) the proximate

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[179] *See* Wilcove et al., *supra* note 11, at 612.
[180] *See id.*; *see also* U.S. FISH & WILDLIFE SERV., *supra* note 10, at 14–16.
[181] *Sweet Home*, 515 U.S. at 708.
[182] *See id.* at 702–04.
[183] Tzankova et al., *supra* note 28, at 453.
[184] *See, e.g.*, Steven P. Quarles & Thomas R. Lundquist, *When Do Land Use Activities "Take" Listed Wildlife Under ESA Section 9 and the "Harm" Regulation?*, *in* ENDANGERED SPECIES ACT: LAW, POLICY AND PERSPECTIVES 214–15 (Donald C. Baur & Wm. Robert Irvin eds., 2002).
[185] For a detailed discussion on the different and unsettled standards for showing harm through habitat modification, *see* Tzankova et al., *supra* note 28, at 451–52.

cause of (2) the death or tangible actual injury (3) to an identifiable member of a listed wildlife (i.e., of a specific, individual animal).[186]

Under the conditions imposed by conservative interpreters of the *Sweet Home* decision—those who aim to constrain the ESA's capacity to rectify the all-too-common problem of harm through the modification, destruction, or degradation of the habitat of endangered and threatened wildlife—a showing of harm would ideally involve dead or severely injured wildlife bodies, with a clearly visible knife sticking out of their back.[187] For instance, dead or visibly hurt individuals of a listed wildlife species whose presence and condition can be directly and unproblematically linked to specific instances of nutrient discharges. In the case of nonpoint nutrient pollution, that could be something like ammonia discharges made in the vicinity of listed aquatic wildlife, and rendering the watery habitat of such wildlife directly and immediately toxic to such wildlife.[188]

Most nutrient enrichment effects on listed species are, of course, far more complex and far less direct, but ultimately not less significant. In the case of the Everglade snail kite, for example, the harm caused by excess nutrients is occurring through nutrient-driven changes in the plant communities of the kite's foraging areas, and the reduction of prey visibility and foraging effectiveness that results from such plant community changes. Specifically, harm is caused by the thicker plant stands dominated by nutrient-responsive invasive plants—both exotic and native invasives.[189] Not exactly a bloody knife, but a chain of causation that clearly ends with the impairment of an essential behavioral pattern—feeding. But is the feeding impairment borne of such nutrient-driven habitat degradation significant enough, and does it injure this endangered bird sufficiently to qualify as prohibited take of snail kites? Is it the kind of adversity that even more conservative interpreters would acknowledge as fitting within the FWS definition of harm through habitat modification which "*actually* kills or *injures wildlife by significantly impairing essential behavioral patterns, including* breeding, *feeding* or sheltering."[190]

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[186] Quarles & Lundquist, *supra* note 184, at 214–15.
[187] *See, e.g.*, *id.* at 216.
[188] For details on ammonia toxicity, *see* USGS, *supra* note 1, at 114 (discussing how nutrient forms such as the un-ionized form of ammonia can be toxic to aquatic plants, invertebrates and fish if above certain concentrations. Ammonia is a common component of synthetic fertilizer and a normal product in the decomposition of manure wastes and other nitrogen containing compounds).
[189] *See supra* notes 165–67 and accompanying text.
[190] 50 C.F.R. § 17.3 (emphasis added).

Under the conservative standards, the harm experienced by the kite would likely be seen as way too uncertain and ultimately insufficient. The mechanisms of harm would be seen as too indirect—the chain of causation from nutrient runoff to any vegetation-change-related detriment experienced by the snail kite would be way too long and tenuous to seriously consider this particular instance of nutrient-caused adversity as harm and take in violation of Section 9 provisions of the ESA. Conservative interpreters specifically insist that a significant impairment of essential behavioral patterns—which can often result from habitat modification or destruction that displaces protected wildlife from traditional breeding, feeding, or sheltering grounds—cannot constitute wildlife injury in and of itself.[191] They demand fairly direct links between habitat-altering activities and species injury for a habitat-altering activity to be scrutinized as a prohibited take.[192]

It is important to note that while it should be useful for ENGOs applying the broader legal strategy proposed in this Article to use the most conservative standards as a guidance in building a case for non-point origin nutrient harm and take in violation of Section 9, there is no reason to expect that all, or even many, actual cases would be subjected to such standards.

As some prominent conservation and ESA scholars have pointed out, the *Sweet Home* opinion has prompted many courts to apply stricter scrutiny in cases alleging take through habitat modification.[193] However, stricter scrutiny is far from the near-rejection of the very possibility of harm through habitat modification that conservative standards effectively imply.[194] Some courts may yet show flexibility on the question of whether a showing of harm to distinct individuals is necessary to demonstrate the occurrence of harm and take in violation of Section 9 of the ESA.[195]

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[191] *See* Quarles & Lundquist, *supra* note 184, at 237.
[192] *See id.* at 237–38.
[193] *See* Doremus, *supra* note 178, at 390 ("The *Sweet Home* opinion's emphasis on the fact that habitat modification does not constitute take unless it actually kills or injures a member of the listed species has had more impact. Although expert testimony concerning the effects of an action on a listed species can still be sufficient to prove harm without the product of an individual injured animal, courts may be looking a bit more skeptically at such expert opinions.").
[194] *See* Quarles & Lundquist, *supra* note 184, at 216.
[195] For a suggestion that there is room for such flexibility, even in a post-*Sweet Home* legal landscape, see Sean C. Skaggs, *Judicial Interpretation of Section 9 of the Endangered Species Act Before and After* Sweet Home*: More of the Same*, *in* ENDANGERED SPECIES ACT: LAW, POLICY AND PERSPECTIVES 276 (Donald C. Baur & Wm. Robert Irvin eds., 2002).

As for the issue of proximate causation and foreseeability, it is unlikely to prove nearly as big of a practical or legal hurdle as conservative readers of the *Sweet Home* opinion would have liked it to be. Indeed, the *Sweet Home* majority itself finds in the legislative history of the ESA the indication that Congress intended the meaning of "take" to be broad enough "to cover *indirect* as well as *purposeful* actions."[196] Further, the Eleventh Circuit, for one, has regarded the Supreme Court discussion of these issues as dicta,[197] and the discussion does not appear to have had significant influence on subsequent cases.[198]

On the practical side, the chain of causation between nutrient runoff from an individual farming operation and the nutrient-triggered harm to listed wildlife somewhere downstream, in a possibly remote part of the watershed is likely to be long, with algal blooms and resulting hypoxia, or nutrient-driven changes in plant communities and the resulting damage to feeding or sheltering grounds all likely links in that chain. The whole chain of causation is often triggered by arguably ordinary farming activities, whose pursuit is frequently remote from the location and consequences of the nutrient enrichment that ends up harming listed species.

Yet after more than fifteen years of explicit and ample scientific and regulatory discussions on the ecological effects and problems of aquatic nutrient enrichment,[199] the harmful effects of nutrient enrichment—even the more subtle or less direct ones—cannot be credibly argued as unforeseeable. Coinciding with this data, the magnitude, severity, and considerable geographic expanse of the consequences from nutrient discharges by crop and animal agriculture have been well known and extensively documented for quite some time.[200] Overall, then, there should be relatively little dispute as to the foreseeability of nonpoint nutrient harm to listed species. However, there is always the opportunity for individual

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[196] Babbitt v. Sweet Home Chapter of Cmtys. for a Great Oregon, 515 U.S. 687, 704 (1995) (emphasis added). O'Connor's concurrence does not exclude indirect causation either; it only excludes causal arguments which fall under the categories of the unforeseeable and the bizarre. *Id.* at 713 (O'Connor, J., concurring).

[197] Doremus, *supra* note 178, at 389–90.

[198] *See id.*

[199] *See* EPA & USDA, *supra* note 53, at i; EPA 1998, *supra* note 33, at 2–5; USGS, *supra* note 1, at 1–2.

[200] *See* EPA 1998, *supra* note 33, at 44; USGS, *supra* note 1, at 10; *see also* Diaz & Rosenberg, *supra* note 176, at 926; Turner et al., *Gulf of Mexico Hypoxia: Alternate States and a Legacy*, 42 ENVTL. SCI. & TECH. 2323, 2323 (2008); *supra* note 11 and accompanying text; *supra* note 143 and accompanying text.

agricultural operations or other nonpoint sources of nutrient runoff to deny the foreseeability or significance of their individual discharges leading to the ultimate harm befalling listed wildlife.

The cumulative nature of nutrient-caused harm will be an issue that ENGOs aiming to use and leverage ESA Section 9 to improve the practical and regulatory controls of nonpoint nutrient discharges will have to address. As discussed below, there are several approaches for handling the cumulatively harmful consequences of individual discharges that may be less ecologically significant when standing alone.[201] Most critical in informing the present analysis is the *Sweet Home* guidance offered by Justice O'Connor, who underscored the question of fairness when it comes to imposing liability for remote consequences: "[p]roximate causation depends to a great extent on considerations of the fairness of imposing liability for remote consequences."[202]

Tracing nutrient-caused harm to the agricultural nonpoint sources of nutrient runoff would indeed be a task. Agricultural discharges causing or contributing to the nutrient enrichment that harms listed species can be distant from the location of the affected species, and can be one of several categories of sources responsible for the harmful enrichment of an aquatic habitat.[203] However, it is a task that can be reasonably accomplished with the use of water quality models. A recent First Circuit ruling has significantly vindicated the use of models in addressing the problem of aquatic nutrient pollution.[204]

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[201] *See infra* Part IV.C.

[202] Babbitt v. Sweet Home Chapter of Cmtys. for a Great Oregon, 515 U.S. 687, 771 (1995).

[203] Houck 2002, *supra* note 13, at 10415 ("To paraphrase a campaign slogan: 'It's about agriculture, stupid!' The nonpoint source pollution that has swamped the nation's waters has many and diverse sources, but the lion's share are agricultural: crops and animals. More than 50% of water impairment nationally comes from agricultural runoff. In some western states dominated by cattle, the number reaches 90%. More than 80% of the eutrophication of the Gulf of Mexico dead zone is attributable to farm loadings over 500 river miles away."). *But see id.* at 10393 ("Turning to the sources of pollution, state data identified less than 5% of impairment from point sources only and about 25% from a combination of point and nonpoint sources. Nonpoint sources were the exclusive sources of pollution for 50% of the listed waters, with the remaining waters polluted by combinations of nonpoint and 'other' sources. The leading source of impairment was agriculture at 24.6%, with another 11.4% attributed to unspecified 'nonpoint' causes.").

[204] *See* Upper Blackstone Water Pollution Abatement Dist. v. U.S. Envtl. Prot. Agency, 690 F.3d 9, 25–27 (1st Cir. 2012). However, the use of water quality models in assigning responsibility for nutrient water quality impairments and allocating discharge-control responsibilities for their reversal through discharge limitations is currently being challenged by the American Farm Bureau Federation on behalf of agricultural interests in the context of the recently issued EPA Chesapeake TMDL. *AFBF Lawsuit Challenges*

C. Attributing Liability for Take Through Nitrogen Pollution: Who Should Be Held Liable for Agricultural Origin Nutrient Harm and Why

The ESA makes knowing violations of its harm and take prohibitions punishable by both civil and criminal penalties.[205] Most importantly for the present analysis, it allows for citizen suits to enjoin Section 9 violations.[206] The value of Section 9 litigation for protecting threatened and endangered wildlife from nutrient-caused harm—as well as the capacity of such litigation to help the broader nutrient-afflicted ecosystems and watersheds of which listed wildlife is a part—hinges on how liability for nutrient-driven harm and take is attributed. It also depends on the remedies that courts will impose to stop such harm.

Now, assuming a satisfactory showing of nonpoint, agricultural origin nutrient harm, who is to be held liable for such harm? And what are the available remedies, and their broader implications for water quality?

An immediately logical option is to look to individual nonpoint sources, such as individual agricultural operations, whose land use activities and practices are the sources of the nutrient runoff ultimately responsible for nutrient enrichment and its various harmful consequences, such as harm to listed aquatic and aquatic-dependent wildlife. Indeed, FWS and NMFS have already recognized a need for Section 9 enforcement against nonpoint sources, but have been reluctant to go ahead with such enforcement.[207] They have been partly discouraged by the anticipated difficulty of meeting the evidentiary burdens for harm and take in a context of multiple diffuse contributors to the nonpoint pollution that ultimately harms listed wildlife.[208] As already discussed above, however, the evidentiary tasks required for tracing nutrient-caused harm to runoff from agricultural and other nonpoint dischargers, while not trivial, are also far from insurmountable.[209] Indeed, the very water quality models

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EPA's Chesapeake Pollution Rule, AM. FARM BUREAU FED'N, http://www.fb.org/index.php?fuseaction=newsroom.newsfocus&year=2011&file=nr0110h.html (last visited Apr. 2, 2013). The scope and capacity for using water quality models in the types of ESA Section 9 litigation discussed above will partly depend on the outcomes of these cases.

[205] 16 U.S.C. §§ 1540(a)(1), 1540(b)(1) (2006).

[206] *Id.* § 1540(g).

[207] *See* Eric Biber, *The Application of the Endangered Species Act to the Protection of Freshwater Mussels: A Case Study*, 32 ENVTL. L. 91, 152 (2002).

[208] *See id.*

[209] In cases where the harm to listed wildlife stems from nutrient enrichment that is the cumulative result of nutrient runoff from many individual agricultural operations, responsibility for the end result can be traced to individual contributors through the use

that are already used to determine the contributions of different dischargers and assign load limits as part of the TMDL process should enable the tracing of nutrient-origin harm to its nonpoint sources.[210]

Compelling practical logic also exists for looking to the state regulators responsible for controlling nonpoint discharges, and singling them out as the ones whose regulatory actions—or inactions—are the cause of agricultural origin nutrient harm to listed wildlife. It is indeed the state water, environmental, or pollution control agencies in charge of protecting state water quality who are uniquely positioned to anticipate and manage the cumulative effects of possibly harmful individual discharges. Further, they can do so with consideration of the consequences that such cumulative pollution may have on aquatic life, both federally listed and otherwise. Such agencies have both the capacity and authority—and in some cases a statutory mandate—to protect water quality from degradation such as that triggered by the nonpoint origin nutrient enrichment that ends up harming some listed species.[211] Yet states are choosing not to exercise their available authorities, with the arguably predictable result of agricultural origin nutrient harm to listed wildlife.[212]

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of water quality models. Different models of liability could be useful in deciding how to apportion the harm and take burden to individual contributors to the larger harmful enrichment. *See, e.g.*, Matthew Gerhart, *Climate Change and the Endangered Species Act: The Difficulty Of Proving Causation*, 36 ECOLOGY L.Q. 167, 189–94 (2009). Since the ultimate objective of ENGO harm and take litigation in cases of agricultural origin nutrient harm is to get injunctive relief, the most important practical aspect of such litigation is identifying the contributors to harmful enrichment. The ENGOs could then focus on obtaining injunctive relief that addresses the agricultural origin nutrient harm by specifying practices whose changes will reduce nutrient enrichment, and apportioning needed reductions, rather than any precise apportioning of liability.

[210] Point sources will also be contributing and they will share in the liability. However, the analysis here is explicitly focused on using the ESA to trigger improved management and control of nonpoint discharges, since the regulatory tools and remedies available for such discharges under the federal-state water quality regime are more limited and have proven ineffective and underused. Since nonpoint discharges have proven resistant to control under the water quality regime, this analysis attempts to find a useful new point of legal and regulatory leverage outside the water quality regime. New leverage could help change the attitudes of nonpoint dischargers towards the idea of binding and enforceable state controls over agricultural discharges, and could also make dischargers more amenable to such controls. Further, new leverage could prod responsible state agencies to ratchet nonpoint discharge regulations, or do a better job of implementing and enforcing the regulations that are already in place, such as those in California or Delaware. *See supra* notes 92–106 and accompanying text.

[211] *See* ELI 1997, *supra* note 14, at 21–22, 32.

[212] *See* ELI 2000, *supra* note 14, at 1.

In addition to the compelling practical logic for holding state regulatory agencies accountable for nutrient-caused harm and take of listed wildlife, there is important legal precedent that supports such an approach. While there are some constitutional limits on the use of citizen suits to hold states accountable for their regulatory actions,[213] the fundamental notion that government regulatory actions can cause the take of protected wildlife has been explicitly affirmed by the holdings of three circuit courts—the First, the Eighth, and the Eleventh, in *Strahan v. Coxe*, *Defenders of Wildlife v. Administrator, Environmental Protection Agency*, and *Loggerhead Turtle v. County Council of Volusia County, Florida (Loggerhead I)*, respectively.[214]

Both *Defenders* and *Strahan* deal with affirmative regulatory acts by government and a "but-for" pattern of causation. In other words, if it wasn't for the regulatory decision or permit issued by a federal or state agency, the act that caused the take of the listed wildlife could not have legally taken place—but-for the agency permit, the act causing the take could not have legally taken place.[215]

In *Loggerhead I*, on the other hand, the Eleventh Circuit explicitly contemplated and accepted the possibility that prohibited harm and take to a listed species can occur by virtue of a state regulator's failure to act diligently enough in the exercise of available regulatory authority.[216] The Eleventh Circuit has specifically established the critical notion that regulatory inactions or deficiencies in the exercise of available statutory authorities and mandates can be legitimately targeted as the cause of prohibited harm and take.[217]

The decision of whether to target individual NPS nutrient dischargers or their state agency regulators will depend on the circumstances of a particular case, including the alignment of several variables of the regulatory context for discharge: whether state water quality, pollution control, or environmental agencies have the necessary statutory authorities to regulate agricultural practices and agricultural NPS discharges in ways that could limit nutrient runoff and contain/prevent

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[213] *See* Strahan v. Coxe, 127 F.3d 155, 166–70 (1st Cir. 1997).
[214] *See id.* at 163; Defenders of Wildlife v. Adm'r, Envtl. Prot. Agency, 882 F.2d 1294, 1301 (8th Cir. 1989); Loggerhead Turtle v. Cnty. Council of Volusia Cnty., Fla. (*Loggerhead I*), 148 F.3d 1231, 1242 (11th Cir. 1998).
[215] *See Strahan*, 127 F.3d at 163; *Defenders of Wildlife*, 882 F.2d at 1301.
[216] *Loggerhead I*, 148 F.3d at 1242 (explaining that the Agency's failure to include the taking of sea turtles through beach lighting in the incidental take permit was dispositive that the Agency did not intend to allow the taking).
[217] *Id.*

nutrient enrichment and nutrient-caused harm to listed species; whether state agencies with the necessary statutory authority to control NPS nutrient discharges are actually exercising this authority (and the extent to which they are exercising available statutory authorities); and whether regulated NPS dischargers are operating in compliance with applicable state regulations and limitations on their nutrient discharges. The alignment of these variables determines the extent to which state water quality, water pollution control, or environmental agencies can be held liable for the harm to listed wildlife from NPS origin nutrient pollution.

If there were absolutely no regulatory controls over agricultural nutrient runoff or the practices contributing to such runoff, coupled with no state regulatory authority over agricultural practices or nutrient discharges from agriculture, then the choice would be an easy one. The targets would be the individual operations whose discharges are the sources of the nutrient enrichment.

However, the practical situation with regulatory control of agricultural nutrient enrichment seldom fits either of these scenarios. There are usually some sources of state regulatory authority over agricultural and other nonpoint nutrient discharges.[218] While they are not direct sector-specific regulations, but rather authorities found in the general provisions of state water quality statutes triggered when agricultural or other nonpoint discharges cause the violation of state water quality standards, they do exist.[219] And for nutrient-impaired waters, there are the federal CWA mandates for state TMDLs that are designed to bring such waters back in line with water quality standards and objectives, and which should be implemented through discharge restrictions on nonpoint as well as point sources.[220]

Another situation where liability rests with individual NPS dischargers, or groups of agricultural operations whose discharges are collectively responsible for nutrient enrichment causing the harm and take of listed wildlife, is when responsible state agencies have done everything that is within their power to regulate NPS nutrient dischargers and enforce applicable discharge controls; however, agricultural sources have persisted in operating in violation of state controls, and the nutrient enrichment attributable to such non-compliance is the cause of harm to listed wildlife. In such cases, NPS dischargers are not only liable for

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[218] *See supra* Part II.
[219] *See* ELI 1997, *supra* note 14, at 9, 11–12; ELI 2000, *supra* note 14, at 3–4. *See generally* ELI 1998, *supra* note 14.
[220] *See supra* notes 79–91 and accompanying text.

violations of relevant state water quality laws and regulations—but more consequentially—for violation of ESA Section 9, while the essentially diligent if unsuccessful state regulators should be exempt from any harm and take liability.[221]

For example, the Eleventh Circuit has clearly charted the terrain of harmfully deficient regulation, and affirmed the possibility of Section 9 liability for regulatory take of listed wildlife that results from a failure to exercise available authorities whose full and proper exercise should avoid harm and take.[222] However, this same precedent does exempt from Section 9 liability "[r]egulatory bodies that adopt, and attempt in good faith to enforce, regulations to prevent take,"[223] even if these regulatory bodies are ultimately unable to achieve perfect compliance. This creates a system where bona fide regulatory efforts still count, and are capable of shielding regulatory agencies from Section 9 liability for the outcomes of their regulatory actions. Yet few state agencies with authority to control agricultural nonpoint discharges come close to meeting this standard of diligence.[224]

While state agency refusal to control nonpoint discharges—or, as in the California and Delaware cases, refusal to enforce applicable regulatory controls[225]—seems different from the affirmative issuance of a fishing permit that the First Circuit found responsible for prohibited take in *Strahan*,[226] a decision not to regulate, or a refusal to heed a mandate to regulate, is no less of a regulatory action than the decision to do so. A discretionary abstention from regulatory action is no more immune to a regulatory take challenge than a discretionary exercise of regulatory authority.[227]

In addition to abstaining from exercise of available regulatory authorities, another common pattern of state regulatory shortfall that can be classified as harmfully deficient is a state's choice of regulatory controls. Specifically, the widespread state agency reliance on voluntary

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[221] *See* Loggerhead Turtle v. Cnty. Council of Volusia Cnty., Fla. (*Loggerhead II*), 92 F. Supp. 2d 1296, 1307 (M.D. Fla. 2000); *see also* Doremus, *supra* note 178, at 392–93.
[222] *See* Loggerhead Turtle v. Cnty. Council of Volusia Cnty., Fla. (*Loggerhead I*), 148. F.3d 1231, 1242 (11th Cir. 1998).
[223] Doremus, *supra* note 178, at 393 (discussing the implications of the *Loggerhead II* decision).
[224] *See supra* notes 92–114 and accompanying text.
[225] *See supra* notes 92–106 and accompanying text.
[226] Strahan v. Coxe, 127 F.3d 155, 158 (1st Cir. 1997).
[227] *See Loggerhead I*, 148. F.3d at 1242.

BMPs for controlling agricultural nutrient discharges—reliance that persists even in the face of ample evidence and experience suggesting the deficiency of such voluntary regulation in preventing harmful nutrient enrichment and over-enrichment.[228] This reliance is arguably a regulatory action, as much a conscious exercise of state regulatory authority as the issuing of a permit for an act that then results in harm and take of listed wildlife.[229] Reliance on ineffective BMPs and the choice not to exercise available regulatory authorities that enable state agencies to impose more binding and enforceable requirements on agricultural nonpoint sources clearly fall in the category of "harmfully inadequate" regulation.[230]

Another instance of potential regulatory take can be found where nutrient-caused harm can be traced to the failure of responsible state agencies to implement or enforce applicable regulations against agricultural nonpoint dischargers. More accurately, the regulatory take would exist when a conscious choice is made not to implement and enforce such requirements. The rampant state failure to implement TMDLs,[231] and specifically, the failure—or more accurately, refusal—to impose discharge restrictions on agricultural nonpoint dischargers as part of such implementation[232] falls under this category of regulatory take.

State environmental, water quality, or pollution control agencies often have the authority to control agricultural or other nonpoint nutrient discharges, but driven by political considerations, they may choose not to exercise such authority.[233] When this occurs, these agencies can be held liable for nutrient-caused harm and take resulting from their regulatory choices.[234]

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[228] *See* ELPC, *supra* note 1, at 3; EWG, *supra* note 15, at 1–2; Adler, *supra* note 14, at 78–80.
[229] The failure to regulate is comparable to Massachusetts's issuing of fishing licenses whose use resulted in the take of Northern Right Whales, at issue in *Strahan*. *See Strahan*, 127 F.3d at 158.
[230] *See Loggerhead I*, 148 F.3d at 1260 (internal quotation marks omitted).
[231] *See supra* note 16 and accompanying text.
[232] *See* Flynn, *supra* note 83, at 47.
[233] *See supra* notes 13–14 and accompanying text.
[234] *See* Doremus, *supra* note 178, at 393. Doremus further underscores that regulatory take liability is still very much a concern, and should still be very much on the minds of regulatory bodies that specifically authorize "or even simply fail[ ] to prohibit, actions that foreseeably take listed species." Further, in at least some locations, the FWS appears to be suggesting that it might premise enforcement actions on that type of liability. For example, the FWS persuaded a water development agency in Texas "'to condition user access to a new water supply line on construction standards designed . . . to avoid harm to an aquatic salamander species' on the theory that the water line would spur local growth, which could impair water quality through runoff, harming the species." *Id.*

D. Targeting Individual Agricultural Operations or Their State Regulators: Available Remedies and Broader Implications

The point of pursuing Section 9 litigation in cases of agricultural origin nutrient harm to listed wildlife is obtaining some practical relief, both for the species and broader aquatic ecosystems against the nutrient pollution causing the harm. ENGOs working to hold individual agricultural operations, groups of such operations, or their state regulators liable for nonpoint origin nutrient harm should be aiming for some form of injunctive relief.

The primary questions then become: what are the practical remedies available that courts could be reasonably expected to impose in these cases? What are the prospects that Section 9 litigation—whether targeted at specific agricultural dischargers or their state regulators—can alleviate the condition of nutrient-afflicted wildlife? Would injunctive relief and other practical remedies resulting from such litigation help water quality and ecological health in the broader nutrient-afflicted watersheds of which listed species are a part?

Whether it is an individual agricultural operation, group operations, or their state regulators that are found liable for harm and take in violation of Section 9, injunctive remedies can draw on a readily available set of BMPs designed to reduce agricultural nutrient pollution by managing both nutrient inputs and nutrient runoff.[235] The technical side of remedying agricultural origin nutrient harm through successful deployment of Section 9 protections against the agricultural operations whose practices are the trigger of such harm is reasonably straightforward, even if implementation of the necessary input and runoff controls is itself far from trivial and potentially labor and resource intensive.

More interesting to consider, however, are the potential political and policy consequences of ESA-based injunctions that result in the imposition of new conditions on the conduct of agricultural operations and their discharges. How are affected agricultural landowners and users likely to react to the potentially sudden and widespread judicial imposition of requirements and conditions on the conduct and discharges of agricultural operations? How will the national industry associations like the American Farm Bureau Federation, who have long represented their interests—and defined such interests in opposition to any binding, enforceable regulation over agricultural practices and discharges[236]—react?

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[235] *See, e.g.*, ELPC, *supra* note 1, at 35–40; David et al., *supra* note 146, at 1665–66.

[236] *See We are Farm Bureau*, AM. FARM BUREAU FED'N, http://www.fb.org/index.php?action=about.home (last visited Apr. 2, 2013).

Such judicial impositions could come directly against the dischargers or through injunctions against the state agency regulators of agricultural practices and discharges.[237] Regardless of the form, the past several decades of experience with attempted environmental controls for agriculture suggest that the affected agricultural operators and their regional and national industry associations are not going to like it, and are certain to fight it in court.[238]

But like it or not, successful judicial imposition of restrictions on agricultural practices and discharges—for example, injunctions that survive appeals—should appreciably change the regulatory context for agriculture. This new regulatory context would present many industry members across different states with an altered set of regulatory choices. Instead of practical near-immunity from discharge controls versus some level of regulation and enforcement on the pollutant content of runoff and/or the practices producing such runoff,[239] many in the agricultural industry would be facing a different choice. The choice would be between judicially imposed, potentially unevenly and unequally applied controls on practices and discharges,[240] or some different, new form of regulatory control. Industry advocates may well get to negotiate new forms of control, but these should be stricter, more substantive controls, negotiated under a new negotiating baseline created by judicially-imposed ESA based remedies.

As more ENGOs seize citizen suit opportunities provided by the presence of nutrient-afflicted listed species in waters impaired by agricultural origin nutrient pollution, more agricultural operators will find themselves at the mercy of the ESA, with the possibility for judicially

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[237] *See supra* Part IV.C.

[238] *See AFBF Legal Advocacy*, AM. FARM BUREAU FED'N, http://www.fb.org/index.php?action=legal.home (last visited Apr. 2, 2013) (explaining that the American Farm Bureau Federation has been in the courts fighting numerous policy and regulatory developments that raise the potential for such stricter controls on agricultural practice). Because the American Farm Bureau Federation proudly advertises its legal advocacy, it is reasonable to expect that it will notice and respond to an actual case of binding controls, arrived at through a type of litigation with a potential for widespread ENGO use. For recent docket listing, see *Recent Docket Table of Contents*, AM. FARM BUREAU FED'N, http://www.fb.org/index.php?action=legal.recentDocketTOC (last visited Apr. 2, 2013). For a list of their cases on behalf of agriculture throughout their history, see *Case Archive Table of Contents*, AM. FARM BUREAU FED'N, http://www.fb.org/index.php?action=legal.caseArchiveTOC (last visited Apr. 2, 2013).

[239] *See supra* Part II.

[240] The main criterion for who gets regulated in this manner is the success of Section 9 litigation.

imposed or judicially driven requirements and restrictions on their operations. Depending on the scale of Section 9 litigation—and the magnitude of its practical effects on agricultural producers—many such producers may find some form of predictable, uniformly applied yet appropriately tailored regulatory controls preferable to the relatively unpredictable risks of harm and take challenges.

If the ESA's close to forty-year history has shown one thing fairly conclusively, it is that hardly anyone, private and governmental actors alike, is comfortable with the specter of ESA liability.[241] Bargaining over regulation can go much more smoothly and with much better conservation outcomes when it takes place in the shadow of this powerful conservation law.[242]

Finally, in considering the broader practical implications of leveraging ESA Section 9 against the dischargers and regulators responsible for agricultural nutrient pollution, it is important to mention several limitations on citizen challenges against state agency actions. These limitations may shape some of the practical outcomes of the proposed ESA strategy, but should not change the core strategic benefits of leveraging ESA Section 9 in the name of improving water quality and reducing agricultural nonpoint pollution.

At first blush, the effects of a successful harm and take challenge against state agencies with regulatory authority over agricultural practices and discharges could be an even bigger boon to listed species and water quality than the success of a Section 9 challenge against an individual agricultural discharger or a group of such dischargers. This is because an injunction against a state agency in a case of agricultural origin nutrient harm to listed wildlife could potentially produce broader statewide or watershed-wide improvements in the control of agricultural pollution. There are, however, some Constitutional limits on the types of injunctive relief available to federal courts when the defendant is a state agency.[243] There are also some Eleventh Amendment limitations on the capacity of ENGOs to sue state agencies that merit a brief discussion.[244]

Increasingly expansive judicial interpretations of the Eleventh Amendment protections for state sovereign immunity are closing the

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[241] *See* Jean O. Melious, *Enforcing the Endangered Species Act Against the States*, 25 WM. & MARY ENVTL. L. & POL'Y REV. 605, 605 (2001).
[242] *See* William F. Pedersen, *Using Federal Environmental Regulations to Bargain for Private Land Use Control*, 21 YALE J. ON REG. 1, 3–5 (2004).
[243] *See infra* notes 245–50 and accompanying text.
[244] *See id.*

opportunities for citizen suits against the states or their agencies.[245] The implications of such limitations for the legal strategy proposed here are ultimately insignificant, however, as the rule created in *Ex parte Young*[246] allows for suits against state officers—in our case, suits that name agency officials, rather than the agency—as long as such suits are seeking declaratory and injunctive relief.[247] Injunctive or declaratory relief are precisely the types of relief desired in harm and take cases against the state regulators of agricultural nonpoint discharges.

Potentially more significant for the deployment of the ESA-based legal and policy strategy outlined in this article are the Tenth Amendment[248] limitations on the types of injunctive relief that a federal court can offer for an ESA violation committed by a state agency. Specifically, these limitations mean that even if a state agency is found liable for a Section 9 violation by virtue of its regulatory actions—or its regulatory negligence—a federal court can issue an injunction but not specifically tell the agency how to regulate.[249] Still, a federal court can direct responsible state agencies to "find a means of bringing [their water quality regulatory] scheme into compliance with federal law [Section 9 of the ESA]."[250]

The courts can, in other words, order a stop to an agency's regulatory behavior that is harmfully insufficient. Since the past several decades of research and regulatory experience have drawn reasonably clear distinctions between successful and unsuccessful technical and regulatory approaches to the control of agricultural nonpoint pollution,[251] the inability of the federal judiciary to call for specific regulatory moves by the states should not significantly detract from the potential of Section 9 litigation to launch a new chapter of improved regulatory controls for agricultural nonpoint pollution.[252]

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[245] *See* Melious, *supra* note 241, at 635 (discussing the Supreme Court's Eleventh Amendment jurisprudence).

[246] Ex parte Young, 209 U.S. 123, 159–60 (1908); *see also* Melious, *supra* note 241, at 643.

[247] Strahan v. Coxe, 127 F.3d 155, 166–67 (1st Cir.1997) ("The holding of *Ex Parte Young* has been limited to actions seeking only declaratory and/or injunctive relief against State officials to halt continuing violations of federal law."); *see also* Melious, *supra* note 241, at 659.

[248] "The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people." U.S. CONST. amend. X.

[249] *See Strahan*, 127 F.3d at 169–70.

[250] *Id.* at 170.

[251] *See supra* Parts I–II.

[252] Indeed, as concluded by the First Circuit in *Strahan*,

> The district court, in answering the defendants' Tenth Amendment challenge, recognized that the [state of Massachusetts] has the choice

CONCLUSION

In sum, the strategic path of using the ESA as a legal lever for bringing some much needed improvement in the control of agricultural nonpoint pollution will be neither direct nor easy. There is much factual and legal work to be done by the ENGOs who take on such a strategy.

Yet, as this Article has tried to argue, the potential payoff from such a strategy—in terms of pollution control and water quality, as well as improved protections for listed species—is more than worth the effort. Fifteen years after the control of agricultural nonpoint pollution and the closely related problem of aquatic nutrient enrichment was made a priority item on the national environmental agenda[253]—fifteen years of regulatory starts and stops and copious CWA litigation—our waters are not better off. The time is ripe for trying a conceptually different approach to improving control of agricultural nonpoint pollution, and for addressing the related and severe problem of nutrient enrichment.

Hopefully, we can indeed find a regulatory silver lining to the predicament of imperiled aquatic fauna, who, alongside other species and entire aquatic ecosystems, are struggling under the burden of nonpoint discharges and nutrient pollution.

> of either regulating in this area according to federal ESA standards or having its regulations preempted by the federal ESA provisions and regulations. Because, for preliminary injunction purposes, the [state of Massachusetts's] regulation of this area is inconsistent with federal ESA standards, this situation falls squarely within the permissible balance of federal and state authority recognized by the New York Court and the [state's] regulations are preempted by the federal ESA provisions.
>
> We believe that the district court acted within the scope of its equitable powers. The ESA governs the relief available in a citizen suit and authorizes citizen suits to enjoin acts in violation of the ESA. . . . The ESA does not limit the injunctive power available in a citizen suit, and, thus, we understand the Act to grant a district court the full scope of its traditional equitable injunctive powers. 'Equitable injunction includes the power to provide complete relief in light of the statutory purpose.'

Strahan, 127 F.3d at 170 (internal citations omitted).

[253] *See* EPA & USDA, *supra* note 53, at i, 58.