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# United States: The Emergence of Environmental Considerations

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## Abstract

This essay traces the emergence of environmental considerations in U.S. water law, beginning with colonial America and proceeding through the Gilded Age of industrialization, the Progressive Era of wise use, the New Deal and the rise of the federal administrative state, and the modern environmental era. Early on, environmental challenges were addressed haphazardly. The federal government influenced water policy through navigational enhancements, reclamation works, and flood control, while state and local law governed water rights and public health issues. The 1970s brought uniform federal effluent limitations and protections for endangered species. The dawn of the twenty-first century increasingly sees collaborative restoration initiatives that draw on the strengths of federal, state, tribal, and local governments and citizens.

**Keywords:** Dams, endangered species, federalism, flood control, pollution, public trust, water quality

## 1 Introduction

Early in U.S. history, colonial and, subsequently, federal and state governments focused almost exclusively on navigation. By the nineteenth century, the rapidly growing nation was facing the realities of water pollution and depletion. Although water quantity and quality are closely related, laws on water use and allocation developed long before laws on pollution and environmental integrity. Today, federal environmental legislation—the Endangered Species Act and the Clean Water Act in particular—eclipses conventional, commodity-oriented water law. This chapter traces the emergence of environmental considerations in U.S. water law, beginning with colonial America and proceeding through four significant eras in U.S. history: the Gilded Age of industrial expansion; the Progressive Era of wise use; the New Deal and the rise of the federal administrative state; and the modern environmental era.

## 2 Colonial America and the Public Trust Doctrine

The chief water-related concern of early colonial governments involved public access to navigable waterways and fisheries (Rogers 1993: 46). When the colonies gained independence, they assumed sovereignty over navigable waters and submerged lands (Clemons 2004). Subsequent states, which entered the Union on an “equal footing” with the original states, have the same authority unless the U.S. clearly expressed the intent to reserve the lands underlying navigable waters for federal purposes (*Pollard v. Hagan* 1845: 222–23). State power is limited by the public trust doctrine and by federal constitutional powers over commerce, public lands, and the receipt of funds (U.S. Constitution: art. I, §8, cls. 1, 3, art. IV, §3, cl.2). The public trust doctrine imposes an obligation on states, as trustees, to protect navigable waters for public use; states may not disregard their obligation to protect waterways and streambeds nor may they convey the trust corpus inconsistently with the public interest (*Illinois Central Railroad v. Illinois* 1892: 453).

From early times, Congress proclaimed that inland navigable waterways were “common highways and forever free” for public use (Wilkinson 1989: 456–57). The federal government, led by the Army Corps of Engineers, developed navigable waters under the premise that “rivers best serve society if they are controlled, diverted, and dammed” (McCool 2005: 1903). As population and industrial activity grew, untreated sewage and other pollutants raised public health concerns nationwide, yet little was done to correct the problem until the early 1900s (Andreen 2004: 553–554).

## 3 The Gilded Age of Industrialization

American law in the nineteenth century encouraged settlement and the exploitation of resources through homesteading, ranching, railroad expansion, and mining (Pisani 2002: xii). Conservation had low priority due to the Gilded Age mentality of limitless resources and laissez-faire policies.

### 3.1 Proprietary and Sovereign Interests in Water Quality

By the mid-1800s, environmental degradation from mining, milling, and sewage had become a serious threat to urban populations. Chicago was a leading example, with sewage pouring into the Chicago River and Lake Michigan (see Hall, in Dellapenna & Gupta 2009: ch. 17), leading to severe cholera outbreaks (Percival 2004: 718–720). Water disputes were largely left to private law remedies under state law, with suits seeking to vindicate property interests in water (see Dellapenna, in Dellapenna & Gupta 2009: ch. 12) as well as to rectify harms from environmental degradation. State governments occasionally asserted the public trust doctrine to protect the public’s interest in

navigable waterways, tidal areas, or fisheries from excessive diversions and pollution, with varying degrees of success (Davis 1988: 380).

Water disputes between states involving interstate pollution, are heard by the U.S. Supreme Court (U.S. Constitution: art. III, §2, cl.2). One early case arose when Chicago reversed the flow of the Chicago River so the city's sewage flowed downstream into the Mississippi River above St. Louis; Missouri's claims were dismissed for failure to prove that bacteria could survive the long journey to St. Louis (*Missouri v. Illinois* 1906: 522–523). New York and New Jersey also litigated over New Jersey's discharge of raw sewage into New York Harbor (*New York v. New Jersey* 1921). New York's claim was dismissed for failure to show that the threatened invasion of rights was of "serious magnitude" (Percival 2004: 737). A few years later, New Jersey sued New York City for polluting New York Harbor with garbage (*New Jersey v. City of New York* 1931). The Court issued an injunction prohibiting dumping, but only after the City was given time to build new incinerators.

### 3.2 *Private Liability for Environmental Degradation*

Early tort theories, such as nuisance and trespass, operated as a type of strict liability, whereby injured parties won redress even if the offending conduct was socially beneficial. Courts enjoined otherwise lawful uses of land for factories and other activities when a neighbor's enjoyment of water, air, or other essential amenities were adversely affected (Beuscher & Morrison 1955). Following the industrial revolution, however, plaintiffs harmed by diminished water quality could not prevail if the discharger did not act "unreasonably." Courts balanced the utility and economic benefit of the polluter's conduct against the costs to the plaintiff and, more broadly, impacts on the public interest. Thus, in *Pennsylvania Coal Co. v. Sanderson* (1886: 457–459), the court held that the acid mine drainage was not a nuisance even though it prevented plaintiff's enjoyment of her house next to a mountain stream, because the drainage was incidental to beneficial activities.

Plaintiffs, particularly governmental entities, had more success with public nuisance claims. A public nuisance is an activity that injuriously affects the exercise of a public right, such as fishing in a navigable stream (Hodas 1989: 883). In *Pennsylvania Railroad Co. v. Sagamore Coal Co.* (1924), the court enjoined a company from discharging polluted drainage into a creek when the discharge adversely affected the plaintiffs' right to use the water for public supply.

Trespass, an interference with exclusive possession of property, arises from a direct and immediate physical invasion of plaintiff's property (*Bradley v. American Smelting & Refining Co.* 1985: 787). Early cases held that any trespass, no matter how slight, was actionable, because of the special legal status of realty. Thus, the Montana Territorial Supreme Court declared in 1871 that there simply was "no right to fill the channel of a creek with tailings and de-

bris" (*Nelson v. O'Neill* 1871: 284; Bakken 2001: 97). As with nuisance, however, courts became more reluctant during the industrial revolution to impose liability in order to protect manufacturers from "harassment" contrary to the public good (*Bradley v. American Smelting & Refining Co.* 1985: 791).

The industrial revolution saw the rise of negligence claims, where liability was imposed for reasonably foreseeable injuries caused by a breach of a legal duty, such as a duty not to cause pollution (Davis 1990: 496). In 1884, California farmers successfully prosecuted a negligence claim against an upstream hydraulic gold mining operation that flooded their crops when the defendant permitted more water to flow than the canal could safely carry (*Harrison v. Spring Valley H.G. Co.* 1884: 381). Failure to prove causation was fatal to negligence claims (*Cauley v. United States* 1965: 869–70).

A final tort option was strict liability for injury caused by abnormally dangerous activities (*Cities Service Company v. State* 1975: 803). Such claims, however, were dismissed when the activity was considered common and its value to the community outweighed its dangerous attributes (*Fortier v. Flambeau Plastics Co.* 1991). These tort theories are still viable today in redressing water pollution, and they are complemented by federal and state environmental legislation.

### 3.3 State Regulatory Efforts

Nineteenth century legislation to address water pollution included an 1852 California law criminalizing water pollution, an 1877 Montana law outlawing the dumping of coal slack in waters, and various state laws prohibiting poisoning drinking water or dumping animal carcasses into streams (Andreen 2003: 170–180; Bakken 2001: 97). Large cities like New York, Chicago, and Pittsburgh created health departments in the 1860s and 1870s. In 1869, Massachusetts established the first operational state health board, followed by other states. Most of these boards were "weak and ineffectual bodies" (Andreen 2003: 179), with minimal funding and under enormous pressure to allow untreated discharges. The late nineteenth century saw increases in industrialization and laissez-faire attitudes, leading to significant externalities and concentrations of power (Gordon 2000: 173–174; Dellapenna 2007: §9.02(a)).

## 4 The Progressive Era

The Progressives, civic-minded urban reformers, believed that the government should lead in making life better for all citizens, not just the special interests. With population growth, it became apparent that the nation's natural resources were limited (Pisani 2002: 277). From around 1890 to 1920, federal policies evolved to reflect progressive ideals (Hays 1959) and states took tentative steps to control water pollution by establishing quasi-zoning systems (Andreen 2003: 182). Although many people still harbored a "deep-seated

distrust of centralized authority,” particularly where property rights were concerned, the public supported the development of policies requiring the wise use of natural resources (Haines 1996: 159; Utley & Mackintosh 1989).

#### *4.1 The Rivers and Harbors Act*

In the 1880s, Congress authorized the Corps of Engineers to prevent navigational obstructions, refuse, and mill wastes in New York Harbor. Congress broadened its geographic focus in the Rivers and Harbors Act (1899). The Act prohibits obstructions to navigation by dams or bridges or by the excavation, filling, or alteration of the watercourse of navigable waters of the United States (33 U.S.C. §§401, 403). Section 13 prohibits the discharge of refuse, except for municipal sewage and stormwater, into navigable waters without a Corps permit (33 U.S.C. §407). The Corps initially applied the Act only to materials that could actually impede navigation, rendering the Act ineffective (Andreen 2003: 221; Percival 2004: 741). Congress took little notice, however, until citizen groups resurrected the Act in the 1960s.

#### *4.2 Water Conservation Through Reclamation*

In the Reclamation Act of 1902, Congress authorized the U.S. Bureau of Reclamation to construct and operate water projects in seventeen western states to supply water to farmers residing on modest-sized tracts (Reclamation Act 1902). Federal reclamation projects promised to “subdue worthless land,” turning deserts into gardens and converting the West into “a commonwealth of small farms” (Pisani 2002: 272). In addition, proponents of comprehensive watershed planning assumed that large-scale federal projects would promote more efficient water use (Tarlock 2004: 1302). The program became the largest public works initiative ever undertaken (Pisani 2002: xvi), supplying water to 20% of western farmers and irrigating ten million acres (Benson 2006: 275). Although 80% of reclamation water is dedicated to irrigation, the projects generate hydropower for six million homes and provide water for over 30 million people. Nevertheless, instead of efficient water use, its legacy was one of adverse environmental and social impacts, including unsustainable growth, exacerbated waste, and the flooding of millions of acres of land (Babbitt 2005: 124–28).

#### *4.3 Flood Control*

The U.S. historically dealt with flood control through the Corps of Engineers (Tarlock 2004: 1301–02). The 1920s ushered in a multifaceted federal flood-control policy, largely because of the Great Mississippi Flood of 1927 (Pisani 2002: 235; Barry 1998). The Flood Control Act (1928) “set a precedent of direct, comprehensive, and vastly expanded federal involvement in local af-

airs....” (Barry 1998: 407). President Hoover’s conservation agenda sought not only flood control, but also strong federal leadership in adopting and implementing a broad national program for the full utilization of the nation’s waterways: “Every drop of water that runs to the sea without yielding its full commercial returns to the nation is an economic waste” (Pisani 2002: 243–44).

## 5 New Deal Water Policy

Progressive ideals resonated for decades and influenced the policies that responded to the Great Depression of 1929–1941. After 1933, President Roosevelt’s “New Deal” made public welfare a matter of federal concern, delegating sweeping regulatory powers to new executive agencies designed to police securities markets, bolster agricultural prices, and safeguard the workplace (Zellmer 2000: 941). Roosevelt put people to work on soil conservation districts, sewage treatment plants, dams, and other water-related projects. Many of these projects benefited the environment, but some did not. An extended drought and unprecedented losses of topsoil due to improvident agricultural policies led to the worst prolonged environmental disaster in American history (Egan 2006: 10). Nearly half of all municipal sewer systems continued to discharge raw, untreated waste (Andreen 2003: 226). New Deal policies spawned massive multi-purpose water projects, yet by treating them as local job relief rather than integrated parts of a national whole, federal water policy became highly fragmented. Bureaucratic rivalries further stymied coordinated planning (Pisani 2002: 271).

### 5.1 *New Deal Flood Control Policies*

The Dust Bowl years of the 1930s were followed by severe flooding on the Missouri River (Ferrell 1993: 63–67) and the Flood Control Act of 1936. The Act commits the federal government to “improve ... navigable waters ... for flood-control purposes” if benefits exceed costs (33 U.S.C. §701a-1; Tarlock 2004: 1301–04). As a result, levees and other flood control projects in many basins have caused the loss of floodplains and the precipitous decline of fish and wildlife species (Zellmer 2004: 336; Houck 2006: 48–50). Although the Act’s highly discretionary cost-benefit provision remains in place, since the 1970s, limitations on flood control activities have been imposed by modern environmental laws.

### 5.2 *Hydropower*

The Federal Power Act of 1920 requires any non-federal entity seeking to build or operate a hydroelectric project to comply with a license from the Federal Power Commission (now known as the Federal Energy Regulatory Commission) (16 U.S.C. §817). The Commission’s authority initially was limited to



navigable waters and federal public lands, but was extended in 1935 to projects on all waterways subject to federal power under the Commerce Clause (Act of Aug. 26, 1935, §§202, 210). The Supreme Court described the Act as “a complete scheme ... which would promote the comprehensive development of the water resources of the nation...” (*First Iowa Hydro-Electric Coop. v. Federal Power Comm’n* 1946: 180). The Court held that the Act pre-empted state laws that were inconsistent with Commission licenses (*First Iowa Hydro-Electric Coop. v. Federal Power Comm’n* 1946: 164, 177–81). Subsequently, the Court distinguished the Federal Power Act from the Reclamation Act, which requires the Bureau “to proceed in conformity with” relevant state laws (*California v. Federal Energy Regulatory Commission* 1990: 504–06).

Today, the Commission has authority to impose a broad array of license conditions, such as fisheries protection and flood control. Although environmental considerations played little role in early licensing decisions (Lawrence 2005: 285), in 1967 the Supreme Court held that when the Commission determines whether a hydroelectric license is in the public interest, it must explore all relevant issues, including future power demand and supply, alternate power sources, preserving reaches of wild rivers and wilderness areas, preservation of anadromous fish for commercial and recreational purposes, and protection of wildlife (*Udall v. Federal Power Comm’n* 1967: 450). Congress further modified the licensing process, requiring the Commission to give “equal consideration” to “the preservation of ... environmental quality” (Lawrence 2005: 285). The Commission also must prepare a cumulative impact assessment of projects within the river basin and accept any conditions on licenses recommended by state or federal agencies or explain in writing why it rejected them (Spence 1999: 430).

The nation’s dam-building zeal spread well beyond hydropower facilities (Klein 1999: 641–642). All told, the Corps of Engineers built nearly 500 dams, the Bureau of Reclamation around 600 dams, and the Tennessee Valley Authority, created in 1933, some 51 dams on the Tennessee River and its tributaries (Adler 1995: 1060–61; Bureau of Reclamation—About Us (2008); McCool 2005: 1905). Hydraulic infrastructure has provided extensive benefits, including water supplies, power, and commercial and recreational navigation, but the costs are high (McCool 2005: 1905). Every major river has been altered by dams, which diminish water quality, block fish passage, and destroy riparian communities. Less than 2% of America’s streams remain free-flowing enough to qualify for inclusion in the Wild and Scenic River program (McCool 2005: 1908).

## 6 The Modern Environmental Era

Industrial expansion and hydraulic works brought tremendous damage to riparian ecosystems. By the 1960s, some states had begun controlling water pollution, but opposition from industry and municipalities discouraged most state authorities from imposing strict regulatory schemes (Andreen 2003:



189–193). Congress therefore enacted laws aimed at preserving free-flowing rivers and water quality, while litigation under the Rivers and Harbors Act of 1899 blossomed.

### 6.1 *The Wild and Scenic Rivers Act*

Congress enacted the Wild and Scenic Rivers Act in 1968 to counter the adverse effects of decades of dam building and flow alterations (16 U.S.C. §§1271–1287; Tarlock & Tippy 1970). The Act proclaims the need to complement the national policy of dam construction with “a policy that would preserve ... selected rivers or sections thereof in their free-flowing conditions to protect the water quality of such rivers ...” (§1271). Rivers are added to the Wild and Scenic Rivers System by Congress or through state nominations to protect their free-flowing condition and other “outstandingly remarkable values,” such as water quality, recreation, scenery, fish, wildlife, or cultural resources “for the benefit and enjoyment of present and future generations” (§1271). The Act aims to preserve free-flowing conditions and to protect and enhance river values (§§1273(a), 1278(a); Diedrich 2002: 5). Designations result in strict controls within the river’s corridor (Colburn 2005: 458 n.166; Spence 1999: 426). No dam or other project under the Federal Power Act may be licensed on any designated river (§1278(a); *City of Klamath Falls v. Babbitt* 1996). The Act also prohibits federal agencies from assisting “by loan, grant, license or otherwise” in the construction of any hydraulic works that would have a direct and adverse effect on a designated river (§1278(a); *Sierra Club North Star Chapter v. Pena* 1998: 979). Finally, designated rivers must be managed “to protect and enhance” outstandingly remarkable values (§1281(a)). Emphasis is given to “aesthetic, scenic, historic, archaeological and scientific features,” and to exceptional water quality (§1281(a)).

### 6.2 *Federal Water Quality Acts Through 1970*

World War II “spawned a chemical revolution” and consequent pollution (Andreen 2004: 553–54). Congress enacted weak provisions for federal abatement of interstate pollution in the Federal Water Pollution Control Act (1948), along with expanded federal research activities and aid for sewage treatment, but left primary responsibility for water quality with the states (Andreen 2003: 291). The Surgeon General was authorized only to investigate a specific pollution problems at the request of a state, and the states were given power to veto any federal enforcement suit that followed (Andreen 2003: 238–39). Prosecutors were required to prove that a polluter had actually endangered public health in an adjacent state and that preventing pollution was physically and economically feasible.

By 1961, the condition of America’s rivers was so poor that the Surgeon General called it “a national disgrace” (Andreen 2003: 241). Inspired by Rachel Carson’s *Silent Spring* and an emerging environmental consciousness,

the public demanded greater protection (Andreen 2003: 244–245). Amendments in 1961 extended enforcement authority to navigable waters and tributaries where discharges endangered health or welfare (Federal Water Pollution Control Act Amendments 1961). Federal power over intrastate pollution was still quite limited, however, as no suit could be filed absent consent of the state governor (Andreen 2003: 242–43). Congress strengthened the federal government’s ability to combat oil pollution in the wake of well-publicized spills such as the wreck of the Torrey Canyon and the 1969 Santa Barbara blowout. Amendments adopted in 1970 prohibited discharges of harmful quantities of oil into navigable waters and imposed hefty fines and strict liability on violators (Water Quality Improvement Act 1970). The 1970 Act also required applicants for federal licenses to obtain state certification that discharges from the proposed activity would not violate state standards (Andreen 2003: 257–58).

### 6.3 *The Revitalization of the Rivers & Harbors Act of 1899*

The enforcement provisions of the Federal Water Pollution Control Act were so cumbersome that, in the mid-1960s, citizens began to use the Rivers and Harbors Act of 1899 to bring private actions against polluters, and also pressured the Corps of Engineers to enforce the Act more aggressively to prevent the discharge of refuse in navigable waters. The Supreme Court held that the Act could be used to enjoin industrial pollution, regardless of whether endangerment to health could be proven (*United States v. Republic Steel Corp.* 1960; *United States v. Standard Oil Co.* 1966). Over 60 enforcement actions were begun under the Rivers and Harbors Act in 1969 and 1970. Even so, the number of polluters continued to grow. President Nixon created the U.S. Environmental Protection Agency in 1970 to address such problems (Andreen 2003: 256).

The Corps of Engineers adopted regulations in 1971 for a permit program covering “all direct and indirect discharges” into navigable waterways or tributaries (Andreen 2003: 259–60). In issuing permits, the Corps was required to obtain the Environmental Protection Agency’s advice regarding compliance with water quality standards. Setting permit levels was a daunting task given the limited data and technical resources available and joint administration was awkward. The program soon “ground to a halt” when a federal court prohibited the issuance of permits for failure to comply with the recently enacted National Environmental Policy Act (*Kalur v. Resor* 1971). The Corps had only issued 20 permits, and 23,000 applications remained in the pipeline (Andreen 2003: 260).

### 6.4 *Environmental Impact Analysis*

Congress enacted the National Environmental Policy Act in 1969 to require federal agencies to prepare an environmental impact statement for “every recommendation or report on proposals ... and other major federal actions

significantly affecting the quality of the human environment” (42 U.S.C. §4332(2)(c); *Robertson v. Methow Valley Citizens Council* 1989). Although this is a limited duty that is wholly procedural and does not force any particular substantive outcome, the Act has wrought extensive changes in the way agencies do business. Environmental analyses provide the information needed by decision makers and stakeholders to evaluate the merits of proposed projects; once details are exposed in this public fashion, political pressure can be brought to bear (Karkkainen 2002: 907). As a result, numerous water projects have been altered to minimize effects on the environment (*Marsh v. Oregon Natural Resources Council* 1989; *Dubois v. Department of Agriculture* 1996).

## 6.5 The Clean Water Act

In the early 1970s, water quality continued to worsen and water-dependent species were suffering (Andreen 2003: 198). In the Clean Water Act of 1972, Congress substantially amended the pre-existing Federal Water Pollution Control Act (33 U.S.C. §1251 note). The Act sets ambitious goals of eliminating water pollution and protecting the chemical, physical, and biological integrity of U.S. waters (33 U.S.C. §1251(a) ). The Act imposes permit requirements on discharges of pollutants into surface waters and adjacent wetlands, strengthens enforcement provisions, supports state and tribal water quality standards, and incorporates elements of “cooperative federalism” to enhance implementation.

### 6.5.1 Discharge Permits

The primary mechanism for accomplishing the Clean Water Act’s goals is §301, prohibiting the “discharge of any pollutant by any person” unless that person obtains a permit either under §402 (the National Pollution Discharge Elimination System) or §404 (dredging and filling) (33 U.S.C. §§1311(a), 1342, 1344). The trigger for both permit requirements is the “discharge of a pollutant,” defined as “any addition of any pollutant to navigable waters from any point source” (33 U.S.C. §1362(12) ). “Point source” means “any discernible, confined and discrete conveyance,” including pipes, ditches, canals, concentrated animal feeding operations and other conduits, except “agricultural stormwater discharges and return flows from irrigated agriculture” (33 U.S.C. §§1362(14), 1342(l)(2) ). Pollutants include garbage, sewage, chemical wastes, biological materials, and even heat (33 U.S.C. §1362(6) ).

“Navigable waters” is defined as “waters of the United States” (33 U.S.C. §1362(7) ). In *United States v. Riverside Bayview Homes* (1985: 133), the Supreme Court upheld federal jurisdiction over wetlands adjacent to a navigable lake, stating that the term “navigable” was of “limited” importance in determining Clean Water Act jurisdiction. Subsequently, the Court refused to extend the Act to a man-made wetland with no connection to a

navigable waterway, stating that to do so would “result in significant impingement of the States’ traditional and primary power over land and water use” (*Solid Waste Authority of Northern Cook County v. Army Corps of Engineers* 2001: 172-74). At present, the agencies require a “significant nexus” with a navigable water body to assert jurisdiction (*Rapanos v. United States* 2006: 779-780).

Permits for point source discharges under the Act must incorporate effluent limitations reflecting the best available technology (33 U.S.C. §1311(b)(2)(A)). Around 100,000 facilities have obtained permits (Environmental Protection Agency 2005). Most permits are issued by state agencies with delegated authority from the Environmental Protection Agency. Permit requirements may be enforced through injunctions, administrative, civil and criminal penalties, and citizen suits (33 U.S.C. §§1319, 1365). As a result, chemical pollutants from point sources have been reduced significantly. Unfortunately, non-point source pollution remains virtually uncontrolled. Programs directed at non-point sources, which include a broad range of activities such as farming and construction run-off, are left to the states. The Environmental Protection Agency lacks direct regulatory authority, but may withhold funding for states that do not take timely steps to address non-point pollution (Adler 2003: 47-56).

States are required to establish water quality standards comprised of designated uses for waterways within the state and standards sufficient to meet those uses (33 U.S.C. §1313). If the states fail to do so, the Environmental Protection Agency must promulgate water quality standards. Waterways that do not meet the standards are listed as impaired and total maximum daily loads must be set. Total maximum daily loads are applied to point sources through the permit program, but mechanisms for applying them to non-point sources are unclear (Adler 2003: 57). As a result, the implementation of water quality standards has been “less than stellar” (Houck 2002: 5, 63), and both urban and rural watersheds remain impaired with pathogens, insecticides, nutrients, and sediments. Riparian areas, moreover, are “some of the most severely altered landscapes in the country” (Adler 2003: 47, 50).

#### 6.5.2 Protecting Wetlands Through Dredge and Fill Permits

By recognizing that wetlands provide a variety of ecosystem services worthy of protection, §404 of the Clean Water Act reflects a sea change in national wetlands policies. Section 404 authorizes the Corps to issue permits “for the discharge of dredged or fill material ... at specified disposal sites” (33 U.S.C. §1344(a) ). The Environmental Protection Agency retains oversight and veto power over the permits. Individual permits are evaluated on a case-by-case basis, while general or nationwide permits may be issued for categories of activities that are similar in nature and have only minimal impacts. To receive an individual permit, the project proponent must demonstrate that there are no practical alternatives to the destruction of wetlands. A practical alternative presumably exists if the project is not water-dependent (40 C.F.R. 230.10(a) ).

Second, steps must be taken to mitigate adverse effects on wetlands (40 C.F.R. 230.10(d) ). Finally, if damage cannot be avoided, the permittee must create or protect other wetlands. Section 404 is complemented by the Swampbuster program of the Food Security Act (1985), which removes incentives to drain wetlands by withholding subsidies from farmers who produce crops on converted wetlands (Kalen 1993: 906 n.175). These acts caused the rate of wetland loss to slow considerably, yet between 1986 and 1997, over 640,000 acres (260,000 ha) were lost (Adler 2003: 52).

### 6.5.3 Cooperative Federalism

The Clean Water Act directs federal agencies to cooperate with states in developing solutions to prevent pollution “in concert with programs for managing water resources” (33 U.S.C. §1251(g) ). The Environmental Protection Agency delegates authority to states and tribes that meet statutory criteria to administer and enforce permit systems. Upon delegation, the Agency’s permit program is suspended, but it may still review and veto proposed permits and must periodically review state or tribal administration to ensure compliance (33 U.S.C. §1342(b)–(c) ). Some states and Indian tribes have utilized their ability to administer Clean Water Act programs to impose requirements that are more protective than federal law (*City of Albuquerque v. Browner* 1996). Section 401 of the Act, moreover, requires applicants for federal licenses to obtain certification from the appropriate state or tribal agency that the proposed project will not impair water quality (33 U.S.C. 1341(a); Spence 1999: 427). States have utilized this provision to impose minimum stream flow requirements on hydropower projects (*S.D. Warren Co. v. Maine Bd. of Environmental Protection* 2006; *PUD No. 1 of Jefferson County v. Washington Dept. of Ecology* 1994).

### 6.5.4 Citizen Enforcement Measures

The successes of the Clean Water Act are attributed in part to public involvement (Plater 1999: 382–83 n.54). The Act provides for a public comment period before a permit may be issued (33 U.S.C. §1342(a)(1) ). Once a decision is made, interested persons may request a hearing before the permitting agency or bring a citizens’ suit in federal court (33 U.S.C. §§1319, 1365). Successful plaintiffs can recoup attorneys’ fees and costs. Ironically, the Act has been construed as pre-empting the federal common law of interstate water pollution (*City of Milwaukee v. Illinois* 1981: 313–14, 317–39). State law remedies remain intact (*Exxon Shipping Co. v. Baker* 2008: \*10).

## 6.6 The Safe Drinking Water Act

In 1974, Congress responded to the public’s concerns about health risks from contaminated groundwater by enacting the Safe Drinking Water Act (42 U.S.C. §§300f–300j–26). Previous enactments had authorized the establishment of standards for bacteriological and some chemical contaminants

in drinking water supplies, but only for interstate carriers and other limited circumstances (Cox 1997: 70). The Safe Drinking Water Act goes much further, regulating many types of contaminants in public drinking water systems—one that “has at least fifteen service connections or regularly serves at least twenty-five individuals” (42 U.S.C. §300f(4)(A)). The Safe Drinking Water Act has four key requirements: establishment of national drinking water standards; regulation of underground injection wells; protection of aquifers that are the sole source of municipal drinking water; and protection of areas surrounding wellheads for municipal supplies. Actual implementation of the standards is left to the states under a delegation from the Agency; absent a delegation, administration is a federal responsibility (42 U.S.C. §§300g-1-300g-3, 300g-5; Cox 1997: 70–71).

Today, the Safe Drinking Water Act covers some 200,000 public water systems serving over 240 million people (Steinzor 1996: 192). “This single measure has done more to improve the health status of the community, and at a lower cost, than any other achievement, not excepting immunization, advances in medical technology, or modern medical treatments and drugs” (Schneeweiss 1997: 77–78). Yet gaps remain. The Act protects only public, not private, drinking supplies. Groundwater is covered if used for public drinking supply, but not if used for agriculture or industry. Even covered drinking supplies may still contain substances posing “relatively high human health risks” (Steinzor 1996: 185). Lack of funding and under-enforcement are at the root of the problems (Steinzor 1996: 221). Regulators find it difficult to prosecute municipalities and small system operators “in light of the political clout of the former group and hapless ineptitude of the latter” (Steinzor 1996: 221). As with the Clean Water Act, citizens’ suits are important in filling the enforcement gap.

### 6.7 *The Endangered Species Act*

The Endangered Species Act is a focal point for debates over the limits of regulatory power and the respective roles of private actors and governments in environmental protection (Doremus 2001: 50; Zellmer 2004: 320). In some cases, the Act has provoked dramatic changes in water usage. The first major battleground between development and environmental interests arose in *Tennessee Valley Authority v. Hill* (1978). The Supreme Court upheld an injunction of a nearly completed multimillion dollar dam because it would jeopardize an endangered fish, finding “that Congress intended endangered species to be afforded the highest of priorities.”

The Endangered Species Act instructs all federal agencies to use existing authorities to conserve listed species (16 U.S.C. §1536(a)(1)), and directs federal agencies to cooperate with state and local agencies on water resource issues relating to endangered species (16 U.S.C. §1531(c)(2)). Section 9, applicable to all persons, forbids the “take” of any member of a listed species of



fish or wildlife (16 U.S.C. §1538(a)(1)(B) ). “Take” includes harassing, harming, and killing listed species, as well as “significant habitat modification or degradation where it actually kills or injures wildlife,” whether on private or public land (16 U.S.C. §1532(19); *United States v. Glenn-Colusa Irrigation District* 1992: 1129–30; *Babbitt v. Sweet Home Chapter of Communities for a Great Oregon* 1995). Section 7, which applies only to federal agencies, prohibits agencies from taking any action that may jeopardize the survival or recovery of listed species or adversely modify critical habitat (16 U.S.C. §1536). Accordingly, neither the Corps nor the Environmental Protection Agency may issue a Clean Water Act permit if the proposed discharge would jeopardize listed species (40 C.F.R. §230.10(b)(3); *National Association of Homebuilders v. Defendants of Wildlife* 2007: 2533). Moreover, because the Bureau of Reclamation is bound by §7, its requirements have been applied to both new and existing water supply projects (*Riverside Irrigation District v. Andrews* 1985: 512; *Klamath Water Users Ass’n v. Patterson* 1999: 1213; *O’Neill v. United States* 1995: 687). Although persons holding state-sanctioned water rights are not privileged to disregard the Act, they must be compensated if their property rights are infringed (*United States v. Glenn-Colusa Irrigation Dist.* 1992: 1134; *Tulare Lake Basin Water Storage Dist. v. United States* 2001).

Procedurally, §7 requires federal agencies to consult with the U.S. Fish and Wildlife Service or, for marine species, with National Oceanic and Atmospheric Administration Fisheries Service for a Biological Opinion if an agency’s proposed action may adversely affect listed species (16 U.S.C. §1532(b) ). If the Service determines that the proposed action may jeopardize the species, it must suggest “reasonable and prudent alternatives.” If the action agency wants to go ahead despite a jeopardy opinion, it may seek an exemption from the Endangered Species Committee, also known as the “God Squad.” The proponent must show that there are no alternatives, that the benefits of the project outweigh the benefits of conserving the species, and that the project is in the public interest (16 U.S.C. §§1536(e), (h)(1) ). Exceptions are rare.

### 6.8 State Instream Flow Laws

State water law historically considered water left in a stream to be wasted. State legislatures recently have adopted statutes requiring maintenance of instream flows, primarily for fish, wildlife, or recreation and, in some cases, for water quality and aesthetics (Covell 1998: 178). Florida law, for example, requires local water districts to establish minimum flows for all watercourses within their jurisdiction at the point at which further withdrawals could be “significantly harmful to the water resources or ecology of the area” (Fla. Stat. Ann. §373.042(1)(b) ). Instream flow requirements have become increasingly valuable for protecting the ecological and economic values of rivers and streams.



## 7 Looking Forward

In recent years, citizens' groups, state and federal agencies, and Indian tribes have initiated restoration efforts on great rivers, such as the Colorado River, entire watersheds, such as the Florida Everglades, and many smaller water bodies. Most restoration initiatives strive to replicate natural flows to meet the needs of native species and to enhance water quality while promoting sustainability and resilience of the system. Approaches range from dam removal to less drastic measures like flood plain protection, altering flow regimes to replicate natural conditions, and habitat construction (Adler 2007). Restoration requires a significant shift in attitudes towards water management. Although the expansion of restoration priorities is "ad hoc, uneven, and not fully supported by adequate authority or funding" (Tarlock 2004: 1308-09), since the 1990s restoration opportunities have cropped up through federal licensing and regulatory requirements.

The re-licensing process under the Federal Power Act has been an indispensable tool (Getches 2001: 47; McCool 2005: 1907). To date, over 500 dams of various sizes have been removed nationwide (Gleick 2006: 6). Other federal agencies have also begun to embrace ecosystem restoration as a priority. The Corps of Engineers, for example, has adopted Environmental Operating Principles to inform its decisions and Congress has expressly identified environmental protection as a central mission for the Corps (33 U.S.C. §2316(a); Army Corps of Engineers 2003: iii). When restoration goals require alterations in water supply, holders of vested water rights can impede or cooperate with the project. An example of a promising cooperative effort can be seen in California, where a large-scale effort known as CALFED brought state and federal agencies together with agricultural, environmental, commercial, and municipal interests in the Sacramento and San Joaquin River Delta to agree upon a comprehensive plan to ensure reliable supplies, promote more efficient water uses, and improve water quality and ecological conditions (Gaines 2002: 164-65).

## 8 Conclusion

The picture of environmental quality of U.S. waterways is far brighter than in the past. Significant gains have been made in reducing point source pollution. Many watersheds, however, remain impaired by hydrological alterations and non-point source pollution. The cooperative federalism structure of modern environmental laws has facilitated pollution control efforts, but tensions between private, state, tribal, and federal actors continue to pose impediments to long-lasting resilient solutions, particularly in areas of jurisdictional overlap such as wetlands protection and flow impairments. Rigorous enforcement of uniform, nationwide environmental standards, coupled with innovative watershed restoration partnerships, will hold the key to future successes.

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