



Spring 1999

## Western Wetlands: The Backwater of Wetlands Regulation

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### Recommended Citation

J. Brian Smith, *Western Wetlands: The Backwater of Wetlands Regulation*, 39 NAT. RES. J. 357 (1999).  
Available at: <https://digitalrepository.unm.edu/nrj/vol39/iss2/7>

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# COMMENT

## Western Wetlands: The Backwater of Wetlands Regulation

### ABSTRACT

*The unique wetlands of the arid, interior western United States are a valuable resource that has been on the decline for centuries. This decline continued because many of the wetlands of the interior west enjoy only limited protection under current federal law. This is due to the unique characteristics of these wetlands relating to climate, hydrology, soils, vegetation, and location, which often result in the failure of these wetlands to qualify for protection under the federal regulatory definitions. Additional protections are needed to protect wetlands of the interior west, particularly western riparian areas that serve the same functions as regulatory wetlands, that may meet the scientific definition of wetlands, but nevertheless are not protected because they do not meet the regulatory definitions of wetlands. Additionally, isolated western wetlands need additional protection because they are in jeopardy of losing current protection through the federal courts' narrowing interpretation of the Commerce Clause and the applicability of federal wetland protection statutes. Additional federal protection for western wetlands is unlikely because of the movement in the courts and in Congress to diminish federal reach into the regulation of private land. Thus, the western states should take the initiative to supplement federal wetland protection with state programs that strike a balance between cost and regulatory intrusion onto private land. Such programs may include participation in federal cost-share programs and programs for the purchase of conservation easements.*

### I. INTRODUCTION

American wetlands have been on the decline at least since the time that the first Europeans set foot on the continent. The historic view of American wetlands aptly explains their demise: "[W]etlands, sources of mosquitoes and impediments to travel...whose draining and filling was a sign of progress, often subsidized by government."<sup>1</sup> Thus, wetlands were drained and filled for agriculture and other development. Consequently, the destruction of wetlands continued at a rapid rate well into the twentieth

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1. *Leovy v. United States*, 177 U.S. 621, 636 (1900).

century. Fortunately, in the latter half of the present century, the environmental and scientific communities began to recognize and document the biological and ecological importance of wetlands ecosystems. As a result, beginning in the 1970s, wetlands began to enjoy increased protection through government programs, policies, and regulation.

Despite this overall increase in wetlands protection, wetlands of the interior western United States are still inadequately protected by the current federal regulatory schemes. Current federal law and regulation are best at protecting coastal wetlands, riverine marshlands, and swamps. Unfortunately, few riverine marshlands and swamps exist in the interior west. Most of these wetland types that once existed in the interior west have already been lost. What remains are riparian wetlands that do not fit the jurisdictional definitions of wetlands and therefore are not protected by current regulation, and isolated and headwater wetlands that are often exempt from regulation. Because of the ecological significance of interior western wetlands, it is imperative that they be protected from further destruction.

This article begins with a summary of the national and western wetland resources and the losses that have occurred. This article then defines wetlands and discusses types of wetlands, particularly the types of wetlands found in the interior western United States. Part V explores the value of wetlands generally, the value of wetlands in the arid and semi-arid west, and then demonstrates why it is especially critical to protect western wetlands. Part VI discusses the federal wetlands protection laws that are currently in place, and Part VII describes the deficiencies of federal laws in protecting western wetlands. Next, this article explores state programs for wetlands protection. Finally, Part IX explores the options for protecting wetlands of the interior west and concludes that, absent a change in the current direction of Congress and the federal courts, the task of protecting wetlands of the interior west must fall to the states and to local entities.

## II. THE HISTORIC LOSSES OF WETLANDS

Pre-colonial America was blessed with an abundance of wetlands. Before European colonization, the area that later became the lower forty-eight states contained approximately 220 million acres of wetlands.<sup>2</sup> Unfortunately, the European settlers viewed the swamps, marshes, and bogs that we now call wetlands as more of a curse than a blessing; just

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2. See NATIONAL RESEARCH COUNCIL, *WETLANDS CHARACTERISTICS AND BOUNDARIES* 16 (1995).

another component of a wild land that needed to be tamed.<sup>3</sup> Wetlands were viewed as "wastelands, ... whose draining and filling was a sign of progress, often subsidized by government."<sup>4</sup> Thus, the early settlers almost immediately began draining wetlands and putting the fertile land underneath to agricultural uses.<sup>5</sup>

The destruction of wetlands has continued from the colonial period into the modern era, resulting in tremendous wetlands losses.<sup>6</sup> By the 1980s, more than one-half of the original wetlands had been destroyed.<sup>7</sup> There are now approximately 100 million acres of wetlands remaining in the lower forty-eight states.<sup>8</sup>

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3. See *id.* at 50. The term "wetland" was coined in the early 1900s but did not come into common scientific usage until the later half of this century. See *id.*

4. See ROBERT V. PERCIVAL ET AL., ENVIRONMENTAL REGULATION LAW, SCIENCE, POLICY 974 (Richard A. Epstein et al. eds., 2d ed. 1996) (citing J. KUSSLER, OUR NATIONAL WETLAND HERITAGE 1 (1983); *Leovy v. United States*, 177 U.S. 621, 636 (1900)). In fact, the first federal wetlands statutes, the Swamp Land Acts of 1849, 1850, and 1860 conveyed wetlands to certain states so that the states could "reclaim" the land for agriculture. 43 U.S.C. §§ 981-994 (1994). See NATIONAL RESEARCH COUNCIL, RESTORATION OF AQUATIC ECOSYSTEMS 264 (1992); NATIONAL RESEARCH COUNCIL, *supra* note 2, at 44.

5. See NATIONAL RESEARCH COUNCIL, *supra* note 2, at 16. Agricultural development in the arid southwest began even before the arrival of Europeans. See CLIFFORD S. CRAWFORD, ET AL., MIDDLE RIO GRANDE ECOSYSTEM: BOSQUE BIOLOGICAL MANAGEMENT PLAN 23 (1993) (on file with U.S. Fish and Wildlife Service, Albuquerque, N.M.). When Don Francisco Vasquez de Coronado arrived in 1540 in the Middle Rio Grande Valley of what is now New Mexico, he found an estimated 25,000 acres under cultivation by the Pueblo Indians. See *id.* The Europeans continued this trend, and by 1700 irrigated acreage increased to about 73,600 acres; by 1800, to about 100,400 acres; and to approximately 125,000 acres in 1880. See *id.* at 22-23. In 1990, approximately 50,000 acres were under cultivation in the Middle Rio Grande Valley. See *id.* at 25. For a comprehensive history of agricultural and other uses in the Middle Rio Grande Basin, see DAN SCURLOCK, U.S. DEP'T OF AGRIC., TECHNICAL REPORT RMRS-GTR-5, FROM THE RIO TO THE SIERRA: AN ENVIRONMENTAL HISTORY OF THE MIDDLE RIO GRANDE BASIN (1998).

6. It is important to note at the outset that estimates of wetland losses, and even the concept of what a wetland is, vary depending on the definition of wetlands used and the classification scheme. There is an important distinction to be made between "scientific" wetlands and "jurisdictional" wetlands. For an excellent discussion of definitional and classificational differences, see NATIONAL RESEARCH COUNCIL, *supra* note 2, at 43-89. As a starting point in defining and classifying wetlands, the majority of literature relies on the U.S. Fish and Wildlife Service's wetland definition, classification scheme, and data. See LEWIS M. COWARDIN ET AL., U.S. DEP'T OF THE INTERIOR, FWS/OBS-79/31, CLASSIFICATION OF WETLANDS AND DEEPWATER HABITATS OF THE UNITED STATES (1979) (reprint with corrections 1992). See also RALPH W. TINER, JR., U.S. DEP'T OF THE INTERIOR, WETLANDS OF THE UNITED STATES: CURRENT STATUS AND RECENT TRENDS (1984); THOMAS E. DAHL, U.S. DEP'T OF THE INTERIOR, WETLANDS LOSSES IN THE UNITED STATES 1780S TO 1980S (1990); THOMAS E. DAHL ET AL., WETLANDS STATUS AND TRENDS IN THE CONTERMINOUS UNITED STATES MID-1970S TO MID-1980S (1991).

7. See PERCIVAL ET AL., *supra* note 4, at 975.

8. See *id.*

With the ever-increasing losses of wetlands, the environmental and scientific communities eventually began to recognize and document the biological and ecological importance of wetlands.<sup>9</sup> As a result, beginning in the 1970s, wetlands began to enjoy increased protection through government programs, policies, and regulations.<sup>10</sup>

Nevertheless, despite more than twenty years of protection, the loss of wetlands continues. Throughout the 1970s and into the 1980s, wetlands continued to disappear at the rate of 300,000 acres a year, due primarily to agriculture and urban development.<sup>11</sup>

The most recent wetlands data show some improvement.<sup>12</sup> These data show that from 1985 to 1995 the loss of wetlands slowed to about 117,000 acres per year, totaling 1.2 million acres lost during this period.<sup>13</sup> Seventy-nine percent (924,000 acres) of the losses during this ten-year period are attributable to agricultural activities.<sup>14</sup> The remaining twenty-one percent of losses are attributable to urban and other development.<sup>15</sup>

Wetlands losses are widespread throughout the United States. Twenty-two states have lost more than fifty percent of their original wetland areas.<sup>16</sup> With the exception of Alaska, New Hampshire, and Hawaii, no state has lost less than twenty percent of its wetlands.<sup>17</sup>

While fewer wetlands occur in the arid and semi-arid western states, the losses are comparatively as severe as the losses in the eastern

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9. See *id.* at 265. Declining waterfowl populations became apparent by the early to mid-1900s. Federal studies pursuant to The Fish and Wildlife Coordination Act of 1934 and the U.S. Fish and Wildlife Wetlands Inventories of 1954 and 1973 confirmed that declining fish and waterfowl populations were attributable to wetlands losses. See *id.*

10. For an excellent history of the development of wetlands regulation, see NATIONAL RESEARCH COUNCIL, *supra* note 2, at 43-64. For a global view of wetlands history, see WILLIAM J. MITSCH & JAMES G. GOSSELINK, *WETLANDS* 3-20 (2d ed. 1993).

11. See News from the U.S. Fish and Wildlife Service, *Wetlands Loss Slows, Fish and Wildlife Study Shows* (Sept. 17, 1998) (available on internet, visited Jan. 27, 1998, <http://www.fws.gov/r9extaff/pr/pr9760.html>). There are many reasons why wetlands losses continue despite federal protection. One reason is that the Fish and Wildlife definition of wetlands includes many wetlands that are not included in the federal "jurisdictional" definitions of wetlands and, therefore, are not protected. Additionally, the federal wetlands protection programs include many exemptions that allow the continued destruction of wetlands. See discussion *infra* Part VI.

12. See *id.* See also T.E. Dahl et al., *Status and Trends of Wetlands in the Conterminous United States - Projected Trends 1985 to 1995* (Sept. 17, 1998) (draft on file with the U.S. Fish and Wildlife Service).

13. See News from the U.S. Fish and Wildlife Service, *supra* note 11.

14. See *id.*

15. See *id.* For tabular summaries of various inventories documenting wetland areas and losses over time, see MITSCH & GOSSELINK, *supra* note 10, at 46-48.

16. See THOMAS E. DAHL, U.S. DEP'T OF THE INTERIOR, *WETLANDS LOSSES IN THE UNITED STATES 1780s TO 1980s*, at 5 (1990).

17. See *id.*

states. Three western states, California, Colorado, and Nevada, have lost more than fifty percent of their wetlands.<sup>18</sup> California has lost ninety-one percent of its wetlands, a greater percentage than any other state.<sup>19</sup> Washington, having lost twenty-seven percent of its wetlands, has lost a smaller percentage than any other western state.<sup>20</sup> It is estimated that riparian areas in the Rocky Mountain region have declined by ninety to ninety-five percent.<sup>21</sup>

Many activities have contributed to the loss of western wetlands. Perhaps the most significant impact results from water projects and associated activities for agriculture and flood control. For instance, the construction of reservoirs impacts wetlands in several ways. The immediate impact of constructing a dam is that the wetlands behind the dam are inundated by water.<sup>22</sup> The wetland vegetation often does not re-establish because the fluctuating water level at the perimeter of reservoirs is not conducive to wetland vegetation.<sup>23</sup> Additionally, reservoirs are usually managed to eliminate downstream flooding, which results in a loss of riparian species that are dependent on flooding for regeneration.<sup>24</sup>

Other activities associated with water projects also adversely affect wetlands, such as stream channelization,<sup>25</sup> drainage of wetlands, ground

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18. See *id.*

19. See *id.*

20. See *id.*

21. See 2 U.S. DEP'T OF THE INTERIOR, THE IMPACT OF FEDERAL PROGRAMS ON WETLANDS, A REPORT TO CONGRESS BY THE SECRETARY OF THE INTERIOR 215 (1994). Table 1 *infra* summarizes wetland losses for the arid and semi-arid western states. A riparian area is an ecosystem that is associated with a high water table because of its proximity to an aquatic ecosystem or to subsurface water. See NATIONAL RESEARCH COUNCIL, *supra* note 2, at 289. Riparian areas may or may not be classified as wetlands, depending on the definition and classification scheme used. The definition used by the U.S. Fish and Wildlife Service tends to include riparian areas as wetlands, while the jurisdictional definitions tend to exclude many riparian areas from the definition of wetlands. For purposes of the general discussion on wetlands, this article includes riparian areas as wetlands. See *infra* Parts III(A) and VII for discussions of the problems associated with wetland definitions and riparian areas.

22. See U.S. DEP'T OF THE INTERIOR, *supra* note 21 at 216.

23. See *id.*

24. See *id.* at 217; WESTERN WATER POLICY REVIEW ADVISORY COMMISSION, WATER IN THE WEST: CHALLENGE FOR THE NEXT CENTURY 2-12 to 2-13 (1998) [hereinafter WATER IN THE WEST].

25. See *id.* at 216; W. L. Winckley & David E. Brown, *Wetlands*, 4 DESERT PLANTS 223, 233 (David E. Brown, ed., 1982) (Special Issue — Biotic Communities of the American Southwest — United States and Mexico). The oxbows and backwater areas that once formed from channel meandering have been essentially eliminated from western rivers by channelization. See *id.* at 233. These oxbows and backwater areas supported wetlands, particularly marshes. See *id.* Thus, these river-dependent marshes are now rare, sometimes occurring in oxbow remnants. See *id.*

In the Middle Rio Grande Valley, it is reported that marshes and wet meadows

water pumping and resultant lowering of the water table, and diversion of water from the stream channel for agricultural irrigation and hydroelectric power generation.<sup>26</sup> Livestock grazing has impacted riparian wetlands significantly in the west. Livestock is attracted to riparian areas because of the shade, lush vegetation, and water.<sup>27</sup> Overgrazing impairs or destroys vegetation, which in turn can lead to erosion, sedimentation, loss of habitat, and the opportunity for undesirable nuisance species to invade.<sup>28</sup> Western wetlands are degraded by the invasion of exotic species such as salt cedar and Russian olive.<sup>29</sup> Wetlands are also lost or degraded through a myriad of other activities such as mining, timber harvesting, and road and bridge building.<sup>30</sup>

The impact of urban development on western wetlands is also significant. It is difficult to find a western community of any size that is not

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associated with the Rio Grande were the wetland habitats suffering the greatest losses from draining and levee building from the 1800s to present. See CLIFFORD S. CRAWFORD ET AL., *supra* note 5, at 72. Prior to drainage, channelization, and damming, the Rio Grande meandered within a one to four mile wide floodplain. See *id.* at 27. Early Spanish accounts frequently mentioned large sloughs and marshes. See *id.* Small lakes, marshes, and wet meadows were a significant component of the Rio Grande ecosystem, see *id.* at 28, until areas were drained for agriculture and development in the 1930s, at which time "the lake and marsh communities 'disappeared almost immediately' . . . the wet meadows gradually became drier, and many were made into agricultural fields, while the willows in the grass-woodland bosque and the river edge cottonwood-willow forest died out." *id.* at 30-31, citing M. Van Cleave, Vegetative Communities in the Middle Rio Grande Conservancy District (unpublished Master's thesis, Dep't of Biology, Univ. of N. M., Albuquerque, N.M. (1935)).

26. See U.S. DEP'T OF THE INTERIOR, *supra* note 21, at 216; NATIONAL RESEARCH COUNCIL, *supra* note 2, at 153. The Central Valley of California is an example of a wetlands ecosystem impacted by a combination of stream channelization, wetlands drainage, and damming. See 2 U.S. DEP'T OF THE INTERIOR, *supra* note 21, at 193-94. More than ninety percent of the original wetlands have been destroyed. See *id.* The dominant land use is now agriculture, primarily cotton but also rice, sugar beets, fruits, nuts, vegetables, grain, and livestock. See *id.* at 191.

27. See U.S. DEP'T OF THE INTERIOR, *supra* note 21, at 216. The Spanish brought livestock to New Mexico in the 1500s. Livestock grazing peaked in 1886. Since 1941, the Bureau of Land Management has reduced grazing on public lands by fifty percent, to approximately seventeen million cattle in 1983. Livestock are grazed on thirty-six percent of the land in the eleven western states listed in Table 1. See *id.* at 215.

28. See *id.* at 216. Western riparian areas are commonly composed of native species of cottonwoods and willows. Because of impacts on the native vegetation, many of the cottonwood bosques are converting to invasive, non-native species such as salt cedar and Russian olive. See *id.* at 219. Perhaps the largest contributor to this phenomenon is dam-building and the subsequent absence of flooding, because flooding is critical to the regeneration of cottonwoods. See *id.*

29. See NATIONAL RESEARCH COUNCIL, *supra* note 2, at 153; 2 U.S. DEP'T OF THE INTERIOR, *supra* note 21, at 219.

30. See NATIONAL RESEARCH COUNCIL, *supra* note 2, at 153; 2 U.S. DEP'T OF THE INTERIOR, *supra* note 21, at 219.

close to a water source. This is particularly true of the major cities.<sup>31</sup> These urban areas have opportunistically expanded into areas drained and dammed for agriculture.<sup>32</sup> As agricultural land is converted to urban land, the possibility of restoring riparian wetlands becomes more remote. The conditions that create wetlands, such as flooding and channel meandering, are even less likely to be restored in urbanized areas than in agricultural areas.

### III. WHAT ARE WETLANDS

#### A. Wetlands Definition

Examples of wetlands are bogs, bottomlands, marshes, mires, moors, sloughs, and swamps.<sup>33</sup> Examples are easy, but defining "wetlands" is more complicated. There are several different wetlands definitions in use, some that are strictly based on science and others that are tailored for regulatory purposes.<sup>34</sup> Nevertheless, most definitions characterize wetlands as areas that are permanently or seasonally wet, that have soil conditions

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31. The early history of Salt Lake City aptly demonstrates this point: [T]he afternoon of July 23, 1847, was the true date of the beginning of modern irrigation. It was on that afternoon that the first band of Mormon pioneers built a small dam across City Creek near the present site of the Mormon Temple and diverted sufficient water to saturate some five acres of exceedingly dry land. Before the day was over they had planted potatoes to preserve the seed.

*California v. United States*, 438 U.S. 645, 648-49 (1978) (citing A. GOLZE, RECLAMATION IN THE UNITED STATES 6 (2d ed. 1961)). The population distribution in New Mexico also exemplifies this point. In 1991, thirty-eight percent of the population of New Mexico lived in the Middle Rio Grande Valley. See CLIFFORD S. CRAWFORD ET AL., *supra* note 5, at 9. The Middle Rio Grande Valley is a 160-mile stretch of the Rio Grande in central New Mexico. See *id.* at 7.

32. In 1975, 17.4 percent of the Middle Rio Grande Valley was "urban" land. See *id.* at 11. By 1986, the amount of urban land had increased to 26.4 percent. An increasing share of the urban land is from conversion of agricultural lands. See *id.*; WATER IN THE WEST, *supra* note 24, at 2-28 to 2-29. The population of the western states grew by 32 percent in the last 25 years, compared to 19 percent in the rest of the nation. By the year 2025, the population of the western states is expected to increase by an additional 28 million residents. Eight of the ten fastest growing states are arid western states. See *id.* at 2-14 to 2-15.

33. See MITSCH & GOSSELINK, *supra* note 10, at 32.

34. See *id.* at 24. Scientists use definitions that promote classification, inventory, and research, while regulators use definitions that are influenced by policy and political considerations. See *id.* Thus, the oft-cited wetlands reports of the United States Fish and Wildlife Service (FWS) that are used to quantify wetlands losses are based on a scientific definition that is different from the regulatory definitions of "jurisdictional" wetlands. See *id.* at 24-25.



that exhibit periodic saturation, and that support vegetation adapted to saturated soil conditions.<sup>35</sup>

The U.S. Fish and Wildlife Service's (FWS) wetlands definition is one of the most comprehensive, and it is widely accepted by scientists.<sup>36</sup>

Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification, wetlands must have one or more of the following attributes: (1) at least periodically, the land supports predominately hydrophytes; (2) the substrate is predominately undrained hydric soil; and (3) the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season each year.<sup>37</sup>

The presence of only one of the three factors, hydrophytic vegetation, hydric soils, or saturated conditions, is needed to qualify an area as a wetland.<sup>38</sup> Vegetation is the primary indicator simply because it is the easiest of the factors to use.<sup>39</sup> The third "hydrologic" factor comes into play only when the substrate is nonsoil, such as gravelly beds or rock.<sup>40</sup>

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35. See MITSCH & GOSSELINK, *supra* note 10, at 22. See also James J. S. Johnson et al., *Bogged Down Trying to Define Federal Wetlands*, 2 TEX. WESLEYAN L. REV. 481 (1996).

36. See MITSCH & GOSSELINK, *supra* note 10, at 25. The Fish and Wildlife Service originally defined wetlands in 1956 in its landmark wetlands report entitled Circular 39. See NATIONAL RESEARCH COUNCIL, *supra* note 2, at 48; MITSCH & GOSSELINK, *supra* note 10, at 25; S.P. SHAW AND C.G. FREEDINE, U.S. DEP'T OF INTERIOR, CIRCULAR 39, WETLANDS OF THE UNITED STATES, THEIR EXTENT, AND THEIR VALUE FOR WATERFOWL AND OTHER WILDLIFE (1956). FWS officially replaced this definition in 1979, and the 1979 definition is still currently in use by FWS and the scientific community. See NATIONAL RESEARCH COUNCIL, *supra* note 2, at 48.

37. See COWARDIN ET AL., *supra* note 6, at 3. While the scientific community widely accepts the FWS definition of wetlands, two additional definitions are used by the federal government to define wetlands for regulatory purposes. See NATIONAL RESEARCH COUNCIL, *supra* note 2, at 57. The United States Army Corps of Engineers adopted a wetlands definition to assist in its regulatory responsibilities under Section 404 of the Clean Water Act. See *id.* at 51; ENVIRONMENTAL LABORATORY, DEP'T OF THE ARMY, TECHNICAL REPORT Y-87-1, CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL 13 (1987) [hereinafter CORPS DELINEATION MANUAL]. The Environmental Protection Agency also uses this definition in fulfilling its responsibilities under Section 404. The National Resource Conservation Service uses its own definition in implementing the "Swampbuster" provisions of the Food Security Act. 16 U.S.C. §§ 3821-3824 (1994). This definition is discussed *infra* Part VI(C).

38. Hydrophytes are plants that grow in water or in soils that are periodically saturated with water. See NATIONAL RESEARCH COUNCIL, *supra* note 2, at 287. Hydric soils are soils that are saturated or flooded often enough to develop oxygen-deficient conditions. See *id.* at 6, 286.

39. See NATIONAL RESEARCH COUNCIL, *supra* note 2, at 55. FWS has developed lists of hydrophytic plants and hydric soils that are used to identify wetlands. See *id.*

40. A non-soil substrate is a rocky substrate, such as a rocky shoreline. See COWARDIN ET AL., *supra* note 6, at 3.

## B. Wetlands Classification

To understand wetlands, it is helpful to first understand generally the different types of wetlands according to how they are classified. A simple and easily understood wetland classification scheme divides wetlands into two major groups—coastal and inland.<sup>41</sup> Coastal wetlands include tidal salt marshes, tidal freshwater marshes, and mangrove wetlands.<sup>42</sup> Inland wetlands include freshwater marshes, northern peatlands, southern deepwater swamps, and riparian wetlands.<sup>43</sup> Based on this classification scheme, the wetland types that are of significance in the arid and semiarid west are freshwater marshes and riparian areas. Freshwater marshes include playas and prairie potholes, wetland types that are unique to the interior western United States.<sup>44</sup>

The U.S. Fish and Wildlife Service uses a much more complex classification system. It classifies wetlands and deepwater habitats<sup>45</sup> into five systems and ten subsystems, and then by class, subclass and dominance type.<sup>46</sup> Two of these systems, the marine and estuarine systems, are strictly tidal wetland classifications.<sup>47</sup> Two additional systems, lacustrine and riverine, are lake and river systems, respectively, and are primarily deepwater habitats.<sup>48</sup> The system most applicable to the arid and semiarid western states is the one remaining system, the palustrine system.

The palustrine system includes all nontidal wetlands dominated by trees, shrubs, persistent emergents,<sup>49</sup> emergent mosses or lichens, and

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41. See MITSCH & GOSSELINK, *supra* note 10, at 33-40.

42. See *id.*

43. See *id.*

44. Playas, or playa lakes, are shallow depressions similar to prairie potholes that are abundant on the Southern High Plains in western Texas and eastern New Mexico. See NATIONAL RESEARCH COUNCIL, *supra* note 2, at 288. A riparian wetland is a wetland associated with a high water table due to its proximity to a stream. See *id.* at 289. Riparian wetlands include the bosques of the southwest, streamside communities along the streams of the Rocky Mountains and the Pacific Northwest, as well as eastern cove forests and streamside communities. See *id.* at 152.

45. "Deepwater habitats are permanently flooded lands lying below the deepwater boundary of wetlands." COWARDIN ET AL., *supra* note 6, at 3.

46. See *id.* at 4.

47. See *id.*

48. Riverine and lacustrine systems are considered deepwater habitats for purposes of wetland status and trend reports. See T.E. Dahl et al., *supra* note 12. However, the wetland elements of these systems, e.g. unconsolidated shorelines, aquatic beds, and nonpersistent emergent wetlands, are considered wetlands for other purposes. See *id.*

49. Persistent emergents are erect, rooted, herbaceous hydrophytes, excluding moss and lichens. See COWARDIN ET AL., *supra* note 6, at 19. A hydrophyte is a plant that grows in water or in substrate (soil) that is at least periodically deficient in oxygen due to excessive water. See

farmed wetlands; and all such wetlands occurring in tidal areas where ocean-derived salinity is less than 0.5 percent.<sup>50</sup> The palustrine system also includes wetlands lacking vegetation but with all of four characteristics: (1) the area is less than twenty acres; (2) the shoreline is not bedrock or active wave formed; (3) the water depth in its deepest part at low water is less than 2 meters; and (4) ocean-derived salinity is less than 0.5 parts per thousand.<sup>51</sup> Simply put, wetlands of the interior west are primarily palustrine systems that include freshwater marshes, playas, and riparian wetlands. The vegetation in these areas includes trees, shrubs, and persistent emergents. Although lacking vegetation, mudflats are also wetlands.

#### IV. THE WETLANDS OF THE INTERIOR WEST

Wetlands of the interior west are a product of the diverse western climate and geography.<sup>52</sup> Average annual precipitation in the interior west ranges from five inches in the southern deserts<sup>53</sup> to fifty inches in the northern mountain ranges.<sup>54</sup> However, with the exception of the higher elevations in the mountain ranges, most of the interior west is semiarid to arid, receiving less than twenty inches of precipitation per year.<sup>55</sup> Elevations range from mountain peaks above 14,000 feet to areas below sea level.<sup>56</sup> Wetlands occur at all of these extremes.<sup>57</sup>

Wetlands occur in all of the western geographic regions, including the Rocky Mountains, the Columbia Plateau Province, the Colorado Plateau, the Great Basin, and the Southern Deserts. While these regions all

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NATIONAL RESEARCH COUNCIL, *supra* note 1, at 287.

50. See COWARDIN ET AL., *supra* note 6, at 10. The dividing line between a lacustrine system and a palustrine system is the line between nonpersistent emergents on the lacustrine side and persistent emergents or forested wetlands on the palustrine side. The same line separates riverine and palustrine systems. See *id.* at 11-13.

51. See *id.*

52. See William S. Platts & Sherman Jensen, *Wetland Riparian Ecosystems of the Great Basin/Desert and Montane Region: An Overview*, in GREAT BASIN/DESERT AND MONTANE REGIONAL WETLAND FUNCTIONS, PROCEEDINGS OF A WORKSHOP HELD AT LOGAN, UTAH 1, 3 (Feb. 27-28, 1986). This area includes the land west of the Great Plains and east of the Sierra/Cascade and Pacific Border Provinces.

53. See *id.* at 17.

54. See *id.* at 6.

55. See *id.* at 1, 6, 13, 15.

56. See Jeffrey M. Klopatek, *Wetlands of the Interior Arid and Montane West: Food Chain Support*, in GREAT BASIN/DESERT AND MONTANE REGIONAL WETLAND FUNCTIONS, PROCEEDINGS OF A WORKSHOP HELD AT LOGAN, UTAH 115, 116 (Feb. 27-28, 1986).

57. See *id.*

have similar wetland types, they each also have certain unique wetland features. Therefore, it is worthwhile to discuss each region separately.

The Rocky Mountain Region is characterized by highly variable precipitation, which is dependent on latitude, elevation, and localized influences of the mountainous terrain.<sup>58</sup> Precipitation in the southern Rockies varies from ten to twenty-five inches, and varies in the northern Rockies from ten to fifty inches.<sup>59</sup> Snowpack in the upper elevations often exceeds ten feet;<sup>60</sup> thus, snowmelt contributes significantly to a seasonal distribution of runoff.<sup>61</sup> In the southern Rockies, summer thunderstorms also contribute significantly to runoff.<sup>62</sup>

Wetlands in the Rocky Mountain region are generally palustrine wetlands associated with river and lake systems.<sup>63</sup> These wetlands include riparian, scrub-shrub,<sup>64</sup> and emergent vegetative types.<sup>65</sup> In the upper reaches of drainages, cirque lakes concentrate drainage and support adjacent wetlands composed of emergent plant communities.<sup>66</sup> Downstream from cirque lakes, riparian wetland communities form along stream channels that are characterized by seasonal flooding.<sup>67</sup> These riparian wetlands are composed primarily of persistent emergent plants and scrub-shrub communities dominated by willows.<sup>68</sup>

The Columbia Plateau region includes parts of Idaho, Oregon, and Washington.<sup>69</sup> Wetlands in this region are associated with the Columbia River system, the internal drainages of the Harvey Lake section, the potholes in the Walla Walla section, and the coulee lakes along the Columbia River drainage.<sup>70</sup> The climate is semiarid and cool, with an average annual precipitation ranging from less than ten inches in the central basins to twenty inches in the mountains.<sup>71</sup> Elevations range from 500 feet above sea level to over 5,000 feet in the Blue Mountains. The two

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58. See Platts & Jensen, *supra* note 52, at 6.

59. See *id.*

60. See *id.*

61. See *id.* at 7.

62. See *id.* at 8.

63. See *id.*

64. Scrub-shrub wetlands are dominated by woody vegetation less than twenty feet tall. See COWARDIN ET AL., *supra* note 6, at 20. The vegetation may be true shrubs, young trees, and trees that are stunted because of environmental conditions. See *id.* These wetlands are one of the most widespread in the United States. See *id.*

65. See Platts & Jensen, *supra* note 52, at 8-9.

66. See *id.*

67. See *id.*

68. See *id.*

69. See *id.* at 10.

70. See *id.* at 12.

71. See *id.* at 11.

major rivers of this region, the Snake River and the Columbia River, are the largest rivers in the western region.<sup>72</sup> The wetlands associated with the Harvey Lake section comprise one of the most extensive inland marshes of the United States.<sup>73</sup> The pothole region of Washington, comprised primarily of 800 to 1,000 permanent and ephemeral potholes located in Grant County, is characterized by rush-sedge meadows, bullrush-cattail swamps, and submerged aquatic plants.<sup>74</sup>

The Colorado Plateau encompasses parts of the Canyonlands Section of southeastern Utah, southwestern and mid-western Colorado, the Grand Canyon section of Arizona, and the Navajo section of Arizona and New Mexico.<sup>75</sup> Precipitation in much of this region is less than ten inches per year, ranging to over twenty inches in the higher elevations.<sup>76</sup> The wetlands in this region are generally associated with perennial and intermittent streams and rivers, springs, seeps, and small potholes.<sup>77</sup> These wetlands are generally riparian and of two types—forested wetlands dominated by cottonwoods, and scrub-shrub wetlands.<sup>78</sup>

The Great Basin region encompasses most of Nevada and western Utah.<sup>79</sup> This region is characterized by internal drainage that leads to the formation of salt flats, playas, and isolated lakes.<sup>80</sup> The region is arid to semiarid, receiving from five to twenty inches of precipitation per year, most of which is from winter snow.<sup>81</sup> The wetlands in this region are supported by lakes, streams, springs, and thermal springs.<sup>82</sup> Thermal springs isolated by desert result in unique habitat containing high concentrations of endemic plant and animal species.<sup>83</sup> However, most wetlands in this region are in association with streams similar to the riparian wetland communities found in the Rocky Mountain Region.<sup>84</sup>

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72. *See id.*

73. *See id.* at 12.

74. *See id.*

75. *See id.*

76. *See id.* at 13.

77. *See id.* at 14.

78. *See id.*

79. *See id.* at 14-15.

80. *See id.* Examples of isolated lakes are Utah Lake, Sevier Lake, and the Great Salt Lake. *See id.*

81. *See id.* at 15.

82. *See id.* at 16.

83. *See id.* at 16-17. Good examples are Ash Meadows, northwest of Las Vegas, and Fish Springs National Wildlife Refuge. *See id.*

84. *See id.*

The arid, inland regions of California, such as the Central Valley, also contain significant wetlands.<sup>85</sup> The Central Valley of California, bordered on the east by the Sierra Nevadas and on the west by the Coast Range, extends for 400 miles from Red Bluff to the mountains south of Bakersfield and encompasses 16,000 square miles.<sup>86</sup> The Central Valley drainage system, which includes the Sacramento River, the San Joaquin River, and their tributaries, supports the largest remaining stands of riparian forest in California.<sup>87</sup> These forests have been described as gallery forests, reminiscent of tropical jungles.<sup>88</sup> They are the only forests in California dominated by broad-leaved, winter-deciduous trees, including maple, cottonwood, sycamore, ash, and walnut.<sup>89</sup>

Surprisingly, the deserts of the southwest also include wetland habitats despite their extreme aridity. The Southern Desert Region, which includes the Mojave and Sonoran Deserts in southern California, Arizona, and New Mexico, receives an average annual precipitation of from five to twelve inches, although isolated summits may receive up to twenty inches.<sup>90</sup> The major river systems in this region are the Colorado River in Arizona and the Rio Grande in New Mexico.<sup>91</sup>

The wetlands of the desert southwest are extremely diverse, occurring from the Arctic-Boreal climatic zone in the highest mountain ranges to tropical-subtropical wetlands in the Sonoran desert.<sup>92</sup> The vegetation communities of the desert southwest are often successional and dynamic because they are subject to periodic disturbances and frequent

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85. The Central Valley of California receives an average of ten inches of rainfall per year. See Anne Sands, *Public Involvement in Riparian Habitat Protection, A California Case History*, in STRATEGIES FOR PROTECTION AND MANAGEMENT OF FLOODPLAIN WETLANDS AND OTHER RIPARIAN ECOSYSTEMS PROCEEDINGS 216, 216 (R. Roy Johnson & Frank J. McCormick eds., Dec. 11-13, 1978) (proceedings of the Symposium in Calloway Gardens, Ga.).

86. See 2 U.S. DEP'T OF THE INTERIOR, *supra* note 21, at 191.

87. See Sands, *supra* note 85, at 216-17.

88. See *id.*

89. See *id.* at 217. The Central Valley originally contained four to five million acres of tidal and freshwater wetlands, including swamps and marshes. See 2 U.S. DEP'T OF THE INTERIOR, *supra* note 21, at 191-93. Less than ten percent of the original wetlands remain, of which approximately 319,000 acres are freshwater wetlands. See *id.* at 192. Of the remaining wetlands, fifty-nine percent are protected through public ownership or perpetual conservation easements. See *id.*

90. See Sandra Brown, et al., *Structure and Function of Riparian Wetlands*, in STRATEGIES FOR PROTECTION AND MANAGEMENT OF FLOODPLAIN WETLANDS AND OTHER RIPARIAN ECOSYSTEMS PROCEEDINGS 216, 216 (R. Roy Johnson & Frank J. McCormick eds., Dec. 11-13, 1978) (proceedings of the Symposium in Calloway Gardens, Ga.).

91. See *id.*

92. See Winckley & Brown, *supra* note 25, at 237-86.

change, such as flooding and grazing.<sup>93</sup> These wetland communities are small relative to other desert communities; however, their importance is disproportionate to their small size.<sup>94</sup>

Perhaps the most important of the southwestern desert wetlands are those that occur in or adjacent to drainageways and their floodplains—the riparian zones.<sup>95</sup> Many of these riparian wetlands have been lost due to hydrologic changes.<sup>96</sup> The historic river channels were typically shallow and braided with deep water in meanders and oxbows.<sup>97</sup> The river bottoms were not well drained, and wetlands occurred as boggy margins, marshy sloughs, and backwaters.<sup>98</sup> These river channels were altered significantly by arroyo cutting, deliberate river channelization, impoundments, diversions, and mining of groundwater.<sup>99</sup> This resulted in the virtual extinction of these riverine marshlands.<sup>100</sup> Because of the loss of these marshlands, the remaining riparian ecosystems are even more important for the maintenance of wetland functions.<sup>101</sup>

Southwestern desert wetlands occur in association with a variety of natural formations. Desert wetlands occur in association with natural lakes and ponds. Although they are rare in the southwest because of the lack of glaciation, general aridity, high evaporation rates, and high siltation rates.<sup>102</sup> The few natural lakes that do exist are high-elevation glacial lakes in Colorado; lagunas, or small sinkholes formed from solution of the underlying rock; and playas, which are closed basin lakes that are often dry.<sup>103</sup> Rock pools are also characteristic of arid southwestern mountain ranges.<sup>104</sup> These pools are critical for the survival of distinctive populations of invertebrates as well as populations of vertebrates, including large

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93. See Winckley & Brown, *supra* note 25, at 231; See also David E. Brown, *Southwestern Wetlands - Their Classification and Characteristics*, in STRATEGIES FOR PROTECTION AND MANAGEMENT OF FLOODPLAIN WETLANDS AND OTHER RIPARIAN ECOSYSTEMS PROCEEDINGS 216, 216 (R. Roy Johnson & Frank J. McCormick eds., Dec. 11-13, 1978) (proceedings of the Symposium in Calloway Gardens, Ga.).

94. See Winckley & Brown, *supra* note 25, at 231.

95. See *id.* The estuarine wetlands in southern California are the most extensive wetlands in the southwestern United States, see *id.* at 235, however, they are outside the scope of this article.

96. See *id.* at 233.

97. See *id.*

98. See *id.*

99. See *id.*

100. See *id.* The Rio Grande exemplifies the drastic changes that western river ecosystems have undergone. See *supra* text accompanying note 25.

101. See *infra* Part V for discussion of wetland functions.

102. See Winckley & Brown, *supra*, note 25, at 233.

103. See *id.* at 233-34.

104. See *id.* at 234. They are small pools scoured from bedrock by flashflood driven boulders. See *id.*

mammals such as Bighorn sheep.<sup>105</sup> Springs have been historically important for wetlands throughout the southwest because they provide a permanent aquatic habitat.<sup>106</sup> Springs have been particularly susceptible to groundwater mining, which has resulted in the destruction of many of these wetland features.<sup>107</sup>

Many of the modern-day wetlands occur in association with man-made features such as artificial reservoirs, farm ponds, stock tanks, ditches, and canal systems.<sup>108</sup>

## V. WHY PROTECT WETLANDS—WETLAND FUNCTIONS AND VALUES

### A. Wetland Functions and Values Generally

The value of wetlands from an ecological standpoint cannot be overstated: "Wetlands are among the most important ecosystems on earth."<sup>109</sup> Wetlands are sometimes described as the "kidneys of the landscape" because of their function in hydrologic and chemical cycles and as sinks for natural and human waste.<sup>110</sup> Wetlands are also described as

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105. See *id.*

106. See *id.* at 234-35.

107. See *id.* at 235.

108. See *id.* at 234.

109. See MITSCH & GOSSELINK, *supra* note 10, at 3. Most discussions on wetland functions and values begin by pointing out the distinction between functions and values. Wetland functions are the physical, chemical and biological processes that characterize wetland ecosystems. See NATIONAL RESEARCH COUNCIL, *supra* note 2, at 215. Values are the measure of importance that society places on wetlands. See *id.* at 216. Thus, while a particular wetland may have a significant biological function, such as denitrification, there may be little societal value outside the scientific community. On the other hand, a wetland with only ordinary functional capabilities may have a great deal of societal value because of its aesthetic or recreational qualities. See *id.* This article does not attempt to differentiate between functions and values but rather recognizes that functions have inherent value. As wetland science improves and becomes more widely known, the distinction between function and value should become less important.

Wetlands functions and values are difficult to assess. However, as interest in protecting and replacing (mitigation) wetlands increases, so does the need to objectively assess wetlands. See *id.* at 215. The National Research Council discusses attempts over the last two decades of scientists and regulators to develop methods of functional assessment. See *id.* at 226. The National Research Council determined that functional assessment is most important in landscape planning but that the procedures for identification and delineation of wetlands must be kept separate from the analysis of wetland functions. See *id.* Perhaps this is in recognition of the limitations of science in assessing wetland function, a desire by some to base wetland protection on individually-assessed value, and the reduction in wetlands protections that would result. See *id.* at 215-16.

110. See MITSCH & GOSSELINK, *supra* note 10, at 4.



"biological supermarkets" because they provide food chain support and contribute significantly to biodiversity.<sup>111</sup> The many important functions of wetlands include flood control, water quality improvement, shoreline protection, groundwater recharge, food chain support, and wildlife habitat.<sup>112</sup>

Wetlands that are associated with streams, such as riparian wetlands and marshes, provide critical flood control functions, including the storage of floodwaters, decreasing floodwater velocity, and reducing peak flows.<sup>113</sup> A watershed that is 30 percent wetlands can reduce the peak flow by sixty to eighty percent.<sup>114</sup> Studies by the Army Corps of Engineers have shown that elimination of wetlands increases the need for costly flood control structures and increases flood damages.<sup>115</sup>

Wetlands enhance in-stream water quality by removing heavy metals, pesticides, and other pollutants.<sup>116</sup> Wetlands also remove excess nutrients, especially nitrogen and phosphorus, that promote algal blooms, increase undesirable aquatic plants, and reduce the oxygen content of water.<sup>117</sup> Pollutants and excess nutrients are removed by plant uptake, accumulation and burial in sediments, or by complex chemical reactions that convert the substances into insoluble or otherwise harmless forms.<sup>118</sup>

Wetlands protect shorelines from erosion by anchoring soils, dissipating wave and current action, and trapping sediment.<sup>119</sup> A wetland's ability to protect shorelines is directly related to the width of the wetland; however, wetlands of as little as two feet in width reduce erosion significantly.<sup>120</sup>

Ground water recharge is an important wetlands function in some hydrologic systems. Wetlands collect water that subsequently recharges ground water through percolation into the soil.<sup>121</sup> Recharge occurs

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111. *See id.*

112. *See id.* at 4, 519-26; J. HENRY SATHER AND R. DANIEL SMITH, U.S. DEP'T OF THE INTERIOR, FWS/OBS-84/18, AN OVERVIEW OF MAJOR WETLAND FUNCTIONS AND VALUES 3, 5-6, 21-22 (1984).

113. *See SATHER & SMITH, supra* note 112, at 3.

114. *See id.* at 5.

115. *See MITSCH & GOSSELINK, supra* note 10, at 519. The Mississippi River exemplifies the important role of wetlands in flood control. The forested wetlands along the Mississippi River could once store the floodwater equivalent of 60 days' river discharge. Today, the wetland storage capacity is twelve days. This is a major cause of flooding along the lower Mississippi River. *See id.* at 519-21.

116. *See SATHER & SMITH, supra* note 112, at 11-14.

117. *See id.* at 14-16.

118. *See id.* at 13.

119. *See id.* at 6-7.

120. *See id.*

121. *See id.* at 6; *See MITSCH & GOSSELINK, supra* note 10, at 523.

primarily around the edges of wetlands because of the reduced permeability of wetland soils.<sup>122</sup> Because of this, ground water recharge is more important in small wetlands such as prairie potholes, which can contribute significantly to regional ground water recharge.<sup>123</sup>

Wetlands provide food chain support by producing nutrients that support a wide variety of flora and fauna.<sup>124</sup> Because wetlands are such dynamic systems, productivity is high when compared to other ecosystems.<sup>125</sup> Scientists believe that the nutrients produced in wetlands not only support organisms within the wetlands, but are also exported from the wetlands into the food chain.<sup>126</sup>

Wetlands are critical to wildlife habitat and biodiversity, supporting obligate plant and animal species as well as many other species that are partially dependent upon wetlands. Wetlands support invertebrates, fish, mammals, and a multitude of birds by providing water, shelter, food, and areas for nesting or spawning.<sup>127</sup> Bird populations, including waterfowl, are particularly dependent on wetlands for survival.<sup>128</sup> Eighty percent of America's breeding bird population is dependent on wetlands.<sup>129</sup> More than fifty percent of the 800 species of protected migratory birds are dependent on wetlands.<sup>130</sup>

Wetlands are essential for the survival of a high percentage of endangered species.<sup>131</sup> Fully half of the 209 animal species listed as endangered in 1986 were dependent upon wetlands.<sup>132</sup> Approximately one third of the native North American freshwater fish species are either endangered, threatened or of special concern, and almost all of these species have been adversely impacted by habitat loss.<sup>133</sup>

The habitat function of wetlands is important to the national economy.<sup>134</sup> Over ninety-five percent of the commercially harvested fish and shellfish in the United States are wetlands-dependent.<sup>135</sup> The fishing industry contributed \$1.7 billion to the gross national product in 1988.<sup>136</sup>

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122. See MITSCH & GOSSELINK, *supra* note 10, at 523.

123. See *id.*

124. See SATHER & SMITH, *supra* note 112, at 21.

125. See *id.* at 22.

126. See *id.*

127. See *id.* at 40-47.

128. See MITSCH & GOSSELINK, *supra* note 10, at 510.

129. See *id.*

130. See *id.*

131. See *id.* at 517.

132. See *id.*

133. See *id.*

134. See *id.* at 510.

135. See MITSCH & GOSSELINK, *supra* note 10, at 514.

136. See *id.*

Wetlands also support the harvest of alligators and fur-bearing animals, such as muskrats, mink, and nutria.<sup>137</sup> In Louisiana alone, approximately \$1.7 million worth of alligators were harvested in 1979.<sup>138</sup> Approximately 12 million animal pelts are harvested each year in North America.<sup>139</sup> The hunting industry in the Mississippi flyway alone contributes \$58 million a year to the economy.<sup>140</sup> Wetlands also provide valuable support for timber production and agricultural use.<sup>141</sup>

Wetlands also have important global habitat functions, playing a key role in the global nitrogen, sulfur, and carbon cycles.<sup>142</sup> Wetlands support the nitrogen cycle by serving as sinks for fertilizer runoff from agriculture, and then returning nitrogen to the atmosphere through denitrification.<sup>143</sup> Wetlands support the sulfur cycle by collecting acid rain, reducing the sulfates to insoluble complexes, and permanently removing them from the cycle;<sup>144</sup> and wetlands support the carbon cycle by serving as sinks for carbon in the form of peat.<sup>145</sup>

Finally, wetlands provide an important socio-economic function that is difficult to quantify. Wetlands are important for their scenic beauty and their recreational, educational, and historical value.<sup>146</sup>

## B. Functions and Values of Western Wetlands

The inhabitants of the arid and semiarid west have recognized the importance of wetlands, particularly riparian wetlands, since long before recorded history. For centuries, the riparian areas have been used for exploratory routes, hunting, fishing, trapping, wood-gathering, and

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137. *See id.* at 508-10.

138. *See id.* at 510.

139. *See id.* at 508.

140. *See id.* at 510.

141. *See* SATHER & SMITH, *supra* note 112, at 61.

142. *See* MITSCH & GOSSELINK, *supra* note 10, at 525-26.

143. *See id.*

144. *See id.*

145. *See id.* at 526. The atmospheric carbon dioxide level is steadily increasing, which is believed to contribute to depletion of the ozone layer and to global warming. *See id.* The primary contributors are burning fossil fuels, which produce carbon dioxide, and clear-cutting tropical forests, which results in oxidation of organic matter with carbon dioxide as a by-product. *See id.* However, converting wetlands to agriculture is also contributing significantly to atmospheric carbon dioxide levels. *See id.*

146. *See* SATHER & SMITH, *supra* note 112, at 58.

general survival.<sup>147</sup> Encompassed by uninhabitable desert, these riparian wetlands were oases to wildlife as well as to humans.<sup>148</sup>

Despite the historic importance of western wetlands, they are poorly understood and in need of study.<sup>149</sup> Productivity studies of western riparian systems are almost non-existent,<sup>150</sup> nutrient retention or export is similarly undocumented,<sup>151</sup> and there have been few studies of wetland functions with respect to water quality in the arid and semiarid western United States.<sup>152</sup> While several studies have documented the importance of western wetlands to bird populations, use by other vertebrate populations is poorly understood, and riparian invertebrate ecology is essentially an unknown field.<sup>153</sup> Western wetlands have received little national attention, probably because of their scarcity in comparison to the eastern United States.<sup>154</sup>

Despite the lack of studies, scientists are aware that western wetlands perform many of the same functions as eastern wetlands. Western riparian areas contribute to flood control by slowing flood waters.<sup>155</sup> Cirque lakes and the riparian ecosystems in glaciated headwaters regulate discharge to streams and effectively reduce sediment flux associated with discharge.<sup>156</sup> Western wetlands provide shoreline protection and reduce erosion, trap sediments, and improve water quality by filtering pollutants.<sup>157</sup> Of course, western wetlands also provide important scenic, aesthetic, educational, and recreational benefits.<sup>158</sup>

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147. R. Roy Johnson, *The Lower Colorado River: A Western System*, in STRATEGIES FOR PROTECTION AND MANAGEMENT OF FLOODPLAIN WETLANDS AND OTHER RIPARIAN ECOSYSTEMS PROCEEDINGS 216, 216 (R. Roy Johnson & Frank J. McCormick, eds. Dec. 11-13, 1978) (proceedings of the Symposium in Calloway Gardens, Ga.).

148. See Klopatek, *supra* note 56, at 115; Johnson, *supra* note 147, at 41; MITSCH & GOSSELINK, *supra* note 10, at 483.

149. See Klopatek, *supra* note 69, at 115; Johnson, *supra* note 147, at 41. See also M.E. SULLIVAN & M.E. RICHARDSON, ENVIRONMENTAL PROTECTION AGENCY REGION IX, SAN FRANCISCO CAL., FUNCTIONS AND VALUES OF THE VERDE RIVER RIPARIAN ECOSYSTEM AND AN ASSESSMENT OF ADVERSE IMPACTS TO THESE RESOURCES 10 (1993) (ground water recharge function of riparian areas in the southwest has not been adequately studied).

150. See MITSCH & GOSSELINK, *supra* note 10, at 492.

151. See Klopatek, *supra* note 56, at 118.

152. See Rex C. Herron, National Marine Fisheries Service, *Wetlands and Water Quality in the Great Basin/Desert and Montane Region of the United States*, in PROCEEDINGS OF A WORKSHOP HELD AT LOGAN, UTAH 60, 61 (Feb. 27-28, 1986).

153. See Johnson, *supra* note 147, at 41.

154. See Klopatek, *supra* note 56, at 115.

155. See 2 U.S. DEP'T OF THE INTERIOR, *supra* note 21, at 214-15.

156. See Platts & Jensen, *supra* note 52, at 8.

157. See 2 U.S. DEP'T OF THE INTERIOR, *supra* note 21, at 214-15.

158. See *id.*

At least one study of the Verde River in Arizona has demonstrated that western riparian wetlands, even those that may not meet the jurisdictional definition of wetlands,<sup>159</sup> serve virtually all of the same functions as do eastern bogs, swamps, and marshes.<sup>160</sup> The U.S. Fish and Wildlife Service conducted the Verde River riparian ecosystem study for use by the Environmental Protection Agency and the Army Corps of Engineers in identifying suitable sites for disposal of dredge and fill material.<sup>161</sup> The functions evaluated in the study included ground water recharge and discharge; flood-flow alteration; sediment stabilization; nutrient removal, transformation, and export; aquatic diversity; wildlife diversity; recreation; and heritage uniqueness.<sup>162</sup> The study found that the Verde River riparian areas provided all of these functions and values.<sup>163</sup>

Perhaps the most studied function of western wetlands is the function of riparian areas in providing habitat for wildlife and promoting biodiversity. Arid western riparian systems are particularly diverse,<sup>164</sup> supporting many unique plant species<sup>165</sup> and providing both food chain support and habitat for a disproportionate number of fish, avian, and other wildlife species when compared to upland areas.<sup>166</sup> Western riparian areas provide habitat for an estimated fifty to seventy-five percent of the vertebrate species found in the western intermontane region, and they are especially important for migratory neotropical birds.<sup>167</sup> In the southwest, more than sixty percent of the vertebrates are obligately associated with riparian ecosystems, and another ten to twenty percent of the vertebrates are facultative users of streamside vegetation.<sup>168</sup> It is estimated that 299 of the 363 species of land vertebrates in the Great Basin of southeastern Oregon depend directly on riparian habitats or use them more than any other habitat.<sup>169</sup>

Western riparian wetlands are critical for the survival of a great number of western bird species. In western Montana, fifty-nine percent of the species of land birds use riparian areas for breeding, and thirty-six

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159. One of the major problems in western "wetland" protection is that western riparian areas often do not meet the definition of "wetlands." This problem is discussed *infra* Part VI(C).

160. See SULLIVAN & RICHARDSON, *supra* note 149.

161. See *id.* at 1.

162. See *id.*

163. See *id.* at 2.

164. See MITSCH & GOSSELINK, *supra* note 10, at 488.

165. See *id.* at 485.

166. See Klopatek, *supra* note 56, at 115.

167. See 2 U.S. DEP'T OF THE INTERIOR, *supra* note 21, at 214-15.

168. See NATIONAL RESEARCH COUNCIL, *supra* note 2, at 153.

169. See *id.*

percent breed only in riparian areas.<sup>170</sup> In southern California, eighty-eight species of birds are strictly riparian, and another twenty-three species use riparian areas extensively.<sup>171</sup> Many additional species use these same riparian areas for food and rest during migration.<sup>172</sup> Fifty-nine of the seventy-six passerine birds in southern California use riparian areas for nesting.<sup>173</sup>

A study of the Rio Grande riparian ecosystem in western Texas exemplifies the importance of western wetlands to wildlife and biodiversity.<sup>174</sup> The Rio Grande traverses the Chihuahuan desert in this region and supports more than sixty vertebrate species that could not survive in the harsh environment otherwise.<sup>175</sup> These species include thirty-five fish species, eleven amphibians and reptiles, thirteen birds, and three mammals.<sup>176</sup> Additionally, thirty different mammal species utilize these riparian areas although they are not strictly dependent on them for survival.<sup>177</sup> At least thirty-eight migratory bird species nest in the Rio Grande riparian habitat.<sup>178</sup> Forty percent of the ninety-four southwestern birds are known to breed within riparian systems.<sup>179</sup>

The Central Valley of California also exemplifies the importance of wetlands, particularly riparian wetlands, in the western United States. The Central Valley supports the largest remaining stands of riparian forest in California.<sup>180</sup> These are the only forests in California dominated by broad-leaved, winter-deciduous trees, including maple, cottonwood, sycamore, ash, oak, and walnut.<sup>181</sup> More species of birds breed in riparian forests than any other habitat in California, and over 100 species of birds use these forests for food and cover.<sup>182</sup> In the Sacramento Valley alone, thirty-nine species of mammals, nineteen species of reptiles and amphibians, twenty-seven species of fish, and seventeen species of butterflies are dependent on

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170. See *id.*

171. See MITSCH & GOSSELINK, *supra* note 10, at 488.

172. See *id.*

173. See *id.* at 488-89. Passerine birds are birds that perch.

174. See David J. Schmidly & Robert B. Ditton, *Relating Human Activities and Biological Resources in Riparian Habitats of Western Texas*, in STRATEGIES FOR PROTECTION AND MANAGEMENT OF FLOODPLAIN WETLANDS AND OTHER RIPARIAN ECOSYSTEMS PROCEEDINGS 216, 216 (R. Roy Johnson & Frank J. McCormick eds., Dec. 11-13, 1978) (proceedings of the Symposium in Calloway Gardens, Ga.).

175. See *id.*

176. See *id.*

177. See *id.*

178. See *id.*

179. See *id.*

180. See Sands, *supra* note 85, at 216-17.

181. See *id.*

182. See *id.*

these riparian ecosystems for survival.<sup>183</sup> Central Valley wetlands provide habitat for five endangered species and three threatened species.<sup>184</sup> The Central Valley wetlands provide winter habitat for nineteen percent of the wintering waterfowl in the continental United States, supporting some of the highest densities of wintering waterfowl in the country.<sup>185</sup>

Many of the arid western wetlands are valuable not only for their functional support of habitat but also because they are so unique. One such wetland is Ash Meadows in Nevada, a habitat sustained by natural springs, some of them thermal.<sup>186</sup> Due to its isolation in a desert ecosystem, the meadows contain the highest concentration of endemic plant and animal species in the continental United States.<sup>187</sup> It is likely that similar undiscovered sites exist in the arid west.<sup>188</sup>

Playas are also a unique western wetlands habitat found on the high plains of northern Texas and eastern New Mexico, providing important waterfowl habitat.<sup>189</sup> Playas are shallow, marsh-like depressions that are characterized by annual or multiyear cycles of drying and filling.<sup>190</sup> Ecological information concerning playas is limited,<sup>191</sup> but the playa marshes often harbor a rich diversity of wildlife because they are "natural islands in a sea of farmland."<sup>192</sup> An estimated 25,000 playas occur in the high plains area, but they have never been inventoried.<sup>193</sup>

## VI. FEDERAL WETLANDS REGULATION

While there are several federal laws that protect wetlands,<sup>194</sup> the most important, particularly to the non-coastal states, are Section 404 of the Federal Water Pollution Control Act,<sup>195</sup> more commonly known as the

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183. *See id.*

184. *See* 2 U.S.C. DEF'T OF THE INTERIOR, *supra* note 21, at 191.

185. *See id.*

186. *See* Platts & Jensen, *supra* note 52, at 16.

187. *See id.*

188. *See id.* at 17.

189. *See* MITSCH & GOSSELINK, *supra* note 10, at 337.

190. *See* NATIONAL RESEARCH COUNCIL, *supra* note 2, at 288.

191. *See id.*

192. *See id.* at 349.

193. *See id.* at 337.

194. *See id.* at 566 for a comprehensive listing of federal laws and directives that are used for the management and protection of wetlands. For example, the Coastal Zone Management Act of 1972, 16 U.S.C. §§ 1451-65 (1994), provides matching funds grants to states to develop plans for coastal management and places a high priority to protecting wetlands. *See id.* at 572. At least twenty-three states have coastal wetland protection programs pursuant to this program. *See id.* at 572-73.

195. 33 U.S.C. § 1344 (1994) [hereinafter Section 404].

Clean Water Act, and the wetland conservation provision of the Food Security Act of 1985,<sup>196</sup> also known as "Swampbuster." The two statutes are administered by different agencies, and are administered independently of one another even though they sometimes have overlapping provisions. A discussion of each statute follows.

### A. Wetlands Regulation under the Clean Water Act

Section 404 of the Clean Water Act provides primary protection for wetlands in the United States.<sup>197</sup> Section 404 provides the statutory basis for a comprehensive, regulatory program, administered by the Army Corps of Engineers and the Environmental Protection Agency, that requires permits for persons intending to disturb wetlands and provides sanctions for persons who violate the permit requirements.<sup>198</sup>

The extent to which wetlands are protected under Section 404 is quite remarkable, given that Section 404 on its face applies to "navigable waters" and does not define or even mention "wetlands." Section 404 requires permits for "the discharge of dredged or fill material into navigable waters at specified disposal sites."<sup>199</sup> "Navigable waters" have historically been defined as "public navigable rivers in law which are navigable in fact."<sup>200</sup> Thus, a casual reading of Section 404, or a reading that

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196. 16 U.S.C.A. §§ 3821-3824 (Supp. 1998).

197. 33 U.S.C. § 1344. See MITSCH & GOSSELINK, *supra* note 10, at 568; Oliver A. Houck & Michael Rolland, *Federalism in Wetlands Regulation: A Consideration of Delegation of Clean Water Act Section 404 and Related Programs to the States*, 54 MD. L. REV. 1242, 1243 (1995).

198. The overall effectiveness of Section 404 as it is currently implemented is a continuing debate that is beyond the scope of this article. Nevertheless, it is worth noting that the continuing loss of wetlands, see text *supra* Part II, indicates that the controls are less effective than they should be. Only a small number of development activities are required to obtain individual section 404 permits because of exemptions and general permit provisions. See PERCIVAL ET AL., *supra* note 4, at 976. In 1994, of more than 48,000 Section 404 permit applications, nearly 40,000 (82 percent) were covered by general permits and, of the remaining 8,000 plus applications, only 358 (0.7 percent) were denied. See *id.* New Mexico Section 404 permitting statistics are comparable. In 1996, 114 (89.8 percent) of the Section 404 applications were covered by general permits, 9 (7.1 percent) were covered by individual permits, 4 applications were withdrawn, and no permits were denied. See Environmental Working Group, *New Mexico Summary of Wetlands Permitting* (visited Apr. 4, 1998) <<http://www.ewg.org/pub/home/wetlands/wetlands.html>>. Furthermore, while EPA has veto power over Corps permit decisions, EPA rarely uses this authority. Between 1972 and 1994, EPA vetoed only eleven permits. See PERCIVAL ET AL., *supra* note 4, at 976-77.

199. 33 U.S.C. § 1344(a) (1994).

200. The test for "navigable waters" has changed little, if any, in the last one hundred years.

The Supreme Court first enunciated the test for navigable waters when discussing rivers, and said: "Those rivers must be regarded as public navigable rivers in law which are navigable in fact. And they are navigable



applies the historic definition of "navigable waters," fails to reveal a statutory basis for national wetlands protection.

The federal courts are primarily responsible for extending the scope of Section 404 to include wetlands. In accordance with the plain language of Section 404, the Army Corps of Engineers originally interpreted its regulatory mandate to include only waters that were "navigable in fact,"<sup>201</sup> a regulatory scheme that exempted many waterways and did not include wetlands at all. However, the federal courts recognized the importance of wetlands in achieving the goals of the Clean Water Act and determined that Congress intended to assert federal jurisdiction under Section 404 to the maximum extent possible under the Commerce Clause.<sup>202</sup>

Consequently, the Corps, following the courts' guidance, revised their regulatory programs and established the Section 404 wetlands protection program that is in place today. Beginning with the Clean Water Act's definition of "navigable waters" as "waters of the United States,"<sup>203</sup> the Corps redefined "waters of the United States" to include navigable waters, tributaries of such waters, interstate waters and their tributaries, nonnavigable intrastate waters whose use or misuse could affect interstate commerce, and wetlands that are adjacent to covered waters.<sup>204</sup> The Supreme Court of the United States whole-heartedly supported these key

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in fact when they are used, or are susceptible of being used, in their ordinary condition, as highways for commerce, over which trade and travel are or may be conducted in the customary modes of trade and travel on water. And they constitute navigable waters of the United States within the meaning of the acts of Congress, in contradistinction from the navigable waters of the States, when they form in their ordinary condition by themselves, or by uniting with other waters, a continued highway over which commerce is or may be carried on with other States or foreign countries in which such commerce is conducted by water."

*Sanders v. Placid Oil Co.*, 861 F.2d 1374 (5th Cir. 1988) (citing *The Daniel Ball*, 77 U.S. (10 Wall.) 557, 563 (1871)). See also 16 U.S.C. § 796(8) (definition of "navigable waters" as waters "used or suitable for use for the transportation of persons or property in interstate or foreign commerce").

201. See *United States v. Riverside Bayview Homes*, 474 U.S. 121, 123 (1985).

202. See *Natural Resources Defense Council v. Calloway*, 392 F. Supp. 685, 686 (D.D.C. 1975) (holding that Congress asserted federal jurisdiction under Section 404 to the maximum extent possible under the Commerce Clause of the Constitution); *United States v. Holland*, 373 F. Supp. 665 (M.D. Fla. 1974); Houck & Rolland, *supra* note 197, at 1262-63.

203. 33 U.S.C. § 1362(7) (1994).

204. See 33 C.F.R. Part 328 (1997), especially § 328.3(a) (definition of "waters of the United States"), § 328(3)(b) (definition of wetlands); *Riverside Bayview Homes*, 474 U.S. at 123-24 (1985).

regulatory definitional changes that now provide the basis for the wetlands protection program under Section 404.<sup>205</sup>

Protections provided by Section 404 include a permitting scheme<sup>206</sup> and penalties for failure to obtain a permit<sup>207</sup> or for violations of a permit.<sup>208</sup> The Section 404 permitting scheme authorizes the Army Corps of Engineers to establish a permit system to regulate the dredging and filling of materials in "waters of the United States."<sup>209</sup> Under this regulatory system, persons desiring to discharge dredge or fill material into wetlands or other "waters of the United States,"<sup>210</sup> must first obtain a permit from the Corps.<sup>211</sup> If the activity will affect wetlands, then the Section 404(b)(1) Guidelines require an evaluation of alternatives.<sup>212</sup> If a "practicable" alternative exists, then the wetland must be left undisturbed.<sup>213</sup> An applicant must clearly demonstrate that no practicable alternative exists before going forward with a permit that will discharge into a wetland.<sup>214</sup>

The 404(b)(1) Guidelines further provide that a permit will not be granted if issuance would violate state or federal water quality standards, cause significant degradation of waters of the United States, jeopardize the existence of a threatened or endangered species, or violate any requirement to protect a marine sanctuary.<sup>215</sup> The Corps must also evaluate the impacts on human health and welfare and the environment, recreation, aesthetics, and economic values.<sup>216</sup> The Corps is to deny a permit unless appropriate and practicable steps are taken to minimize the potential adverse

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205. See *Riverside Bayview Homes*, 474 U.S. at 121 (1985). The Court stated, "We are thus persuaded that the language, policies, and history of the Clean Water Act compel a finding that the Corps has acted reasonably in interpreting the Act to require permits for the discharge of fill material into wetlands adjacent to the 'waters of the United States.'" *Id.* at 139.

206. See 33 U.S.C. §1344(a). This statutory permitting scheme is supplemented by regulations promulgated by the Corps, 33 C.F.R. pts. 323-330 (1997), and by the Environmental Protection Agency (EPA), 40 C.F.R. §§ 230.1-230.80 (1997). The EPA regulations are referred to as the Section 404(b)(1) guidelines. *Id.*

207. See 33 U.S.C. § 1319.

208. See 33 U.S.C. § 1344(s).

209. See 33 U.S.C. § 1344(a).

210. See 33 C.F.R. §§ 328.2, 328.3 (1997).

211. "The Secretary [Secretary of the Army, acting through the Chief of Engineers, 33 U.S.C. 1344(d)] may issue permits . . . for the discharge of dredged and fill material into navigable waters at specified disposal sites." 33 U.S.C. § 1344(a). See MITSCH & GOSSELINK, *supra* note 10, at 568.

212. See 33 U.S.C. § 1344(b)(1). See Houck & Rolland, *supra* note 197, at 1256 & n.75.

213. See 33 U.S.C. § 1344(b)(1). See also Steven W. Watkins, *Congressional Attempts to Amend the Clean Water Act; American Wetlands Under Attack*, 72 N. DAK. L. REV. 125, 130-31 & n.53 (1996) (discussion of the practicable alternative test).

214. See Houck & Rolland, *supra* note 197, at 1256.

215. See 40 CFR § 230.10(c) (1997); Watkins, *supra* note 213, at 132.

216. See 40 CFR § 230.10(c); Watkins, *supra* note 213, at 132.

impacts.<sup>217</sup> The Environmental Protection Agency (EPA) assists the Corps in administering Section 404 and has veto power over the Corps' decisions.<sup>218</sup>

The Section 404 requirements and their underlying regulations are also supplemented by a Memorandum of Agreement (MOA) between the Corps and EPA.<sup>219</sup> This agreement announced a national policy of "no overall net loss of wetlands."<sup>220</sup> This MOA provides, as do the 404(b)(1) Guidelines, that wetlands losses must be avoided if possible; if not possible, only then can mitigation be considered.<sup>221</sup> Mitigation under the MOA requires replacement of the functional values of the wetlands and a margin of safety to allow for the uncertainty of replacement.<sup>222</sup>

Section 404 provides exemptions from permitting for certain activities. No permit is required for the discharge of dredged or fill material from normal farming, silviculture, and ranching activities such as plowing, seeding, cultivating minor drainage, harvesting for the production of food, fiber and forest products, or upland soil and water conservation practices.<sup>223</sup> A permit is not required for repairing dikes, dams, levees, and bridges; constructing or maintaining farm and stock ponds, irrigation ditches, and temporary sedimentation basins which do not include placement of fill into navigable waters; or constructing farm and forest roads and temporary mining roads under certain conditions.<sup>224</sup>

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217. See 40 CFR § 230.10(d); Watkins, *supra* note 213, at 126-32 (detailed description of the permitting process); DR. JON A. KUSLER, ENVIRONMENTAL LAW INSTITUTE, OUR NATIONAL WETLAND HERITAGE: A PROTECTION GUIDEBOOK, 59-63 (1983) (permitting process).

218. See MITSCH & GOSSELINK, *supra* note 10, at 569; 33 U.S.C. § 1344(c). EPA was perceived as too environmentally-oriented by developers and too insensitive to aquatic values by environmental interests, resulting in a jurisdictional split between EPA and the Corps. See Houck & Rolland, *supra* note 197, at 1255. Some scholars believe that the involvement of multiple agencies may enhance the effectiveness of the program. "With no attribution of good faith or bad faith to either agency, it would appear that independent review by a second agency helps keep the system focused on statutory goals." *Id.* "Like a lone state trooper on a busy interstate highway, the mere presence of EPA's authority tends to keep the level of speeding down." *Id.* at 1256.

Other federal agencies are also involved in Section 404 permitting. The U.S. Fish and Wildlife Service and the National Marine Fisheries Service formally consult on these permitting issues. See *id.* at 1257 & n.92. These consultations fall short of veto power but may often lead to mitigation. See *id.* at 1258.

219. Memorandum of Agreement Between the Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation Under the Clean Water Act Section 404(b)(1) Guidelines, 20 ENVTL. L. REP. 35,223 (Feb. 6, 1990) [hereinafter Mitigation MOA].

220. See Mitigation MOA, *supra* note 219; Houck & Rolland, *supra* note 197, at 1257.

221. See Mitigation MOA, *supra* note 219; Houck & Rolland, *supra* note 197, at 1257.

222. See Mitigation MOA, *supra* note 219; Houck & Rolland, *supra* note 197, at 1257.

223. See 33 U.S.C. § 1344(f)(1) (1994).

224. See 33 U.S.C. § 1344(f)(1).

The enforcement mechanisms of the Clean Water Act can be quite severe. EPA may initiate civil action against Section 404 violators for appropriate relief, including temporary and permanent injunctions.<sup>225</sup> Civil penalties can be as much as \$25,000 per day for each violation.<sup>226</sup> Failure to obtain a Section 404 permit where one is required can result in criminal penalties.<sup>227</sup> A "knowing" violation is punishable by a fine of not less than \$5,000 nor more than \$50,000 per day of violation, imprisonment for three years, or both.<sup>228</sup> A second-time, "knowing" offender could receive as much as a \$100,000 per-day penalty and six years in prison.<sup>229</sup>

The regulation of wetlands under Section 404 has always been plagued with definitional questions that determine the scope of the program. Questions continue to arise concerning the applicability of "navigable waters" and "waters of the United States."<sup>230</sup> It is now established that "waters of the United States" include wetlands; however, the courts continue to wrestle with its application with respect to how it applies to isolated wetlands.<sup>231</sup>

The second common question concerns the definition of "discharges of dredge and fill material."<sup>232</sup> It is clear that Section 404 covers the situation where earthen material is dredged from wetlands and replaced so that the discharge drains back into the wetlands. It is also clear that Section 404 covers the situation where fill material from elsewhere is used to fill wetlands. Uncertainty arises in ditching, channeling, and draining operations in which the material removed is placed outside the wetlands.<sup>233</sup> In 1993, the Corps clarified through final rules that "activities producing any incidental redeposition of dredged materials 'however temporary or small' require section 404 permits when they would destroy or degrade

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225. See 33 U.S.C. §§ 1319(c); 1344(s).

226. See 33 U.S.C. §§ 1319(d); 1344(s).

227. See 33 U.S.C. § 1319(c).

228. See *id.*

229. See *id.* See, e.g., *United States v. Wilson*, No. 96-4498, No. 96-4503, No. 96-4537, No. 96-4774, 1997 U.S. App. LEXIS 35,971, at 2 (4th Cir. 1997). A violator charged with four felony counts of knowingly discharging fill material into wetlands without a permit was found in violation of 33 U.S.C. §§ 1319(c)(2)(A) & 1311(a). The district court sentenced the offender to twenty-one months in prison, one year supervised release, and fined him \$1 million. See *id.* at 35,971. (The sentence was overturned on appeal due to lack of jurisdiction.) See text *infra* Part VII.

230. See *supra* text accompanying note 205.

231. See *infra* Part IX(A)(2). The Supreme Court has noted this question but has not yet addressed it. See *United States v. Riverside Bayview Homes*, 474 U.S. 121, 131 n.8 (1985).

232. See *PERCIVAL ET AL.*, *supra* note 4, at 976.

233. See *id.*; *American Mining Congress v. United States Army Corps of Eng'rs*, 951 F. Supp. 267 (1997), *aff'd* 145 F.3d 1399 (1998).

wetlands."<sup>234</sup> However, the court has enjoined the Corps from enforcing this rule.<sup>235</sup> Therefore, at present, "discharges from dredging and filling" do not include ditching, channeling, or draining where dredged material is not placed and does not discharge back into the wetlands.

One critical definition that has generated surprisingly little controversy in recent years is the definition of "wetlands." Although critical in defining the scope of Section 404, the definition has not been modified since its adoption in 1977.<sup>236</sup> The Corps defines wetlands as:

Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.<sup>237</sup>

Thus, the Corps' definition places primary importance on hydrologic conditions, namely saturation and inundation. Hydrophytic plants and hydric soils are indicators of the hydrologic conditions. With limited exceptions, at least one indicator from all three factors (or parameters) must be present for a positive wetland determination.<sup>238</sup>

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234. See *American Mining Congress*, 951 F. Supp. at 269-70. The Corps and EPA implemented this rule, called the Tulloch Rule, to prevent developers from carefully draining wetlands by ditching and placing the dredged material outside the wetlands. Once the wetlands were dry, the developers were free to operate without being subject to Section 404. See *infra* Part IX(A)(2).

235. See *id.*

236. See NATIONAL RESEARCH COUNCIL, *supra* note 2, at 51.

237. 33 C.F.R. § 328.3(b) (1997); 42 Fed. Reg. 37, 125-26, 37128-29, July 19, 1977; CORPS DELINEATION MANUAL, *supra* note 37, at 14. This definition is also used by the Environmental Protection Agency in fulfilling its responsibilities under Section 404. 40 C.F.R. § 230.3(t) (1997).

238. See CORPS DELINEATION MANUAL, *supra* note 37, at 13-14. It is important to note the differences between the U.S. Fish and Wildlife (FWS) definition of wetlands, which is widely accepted by the scientific community, and the Corps definition used for regulatory purposes under Section 404. The differences, and potential problems, created by these varying definitions become apparent when they are compared. The FWS definition requires the presence of only one of three factors to find that a wetland exists; either a saturated hydrologic condition, the presence of hydrophytic vegetation, or the presence of hydric soils. See NATIONAL RESEARCH COUNCIL, *supra* note 2, at 54. The Corps definition focuses on a saturated/inundated hydrologic condition, and requires that indicators of all three conditions exist. See CORPS DELINEATION MANUAL, *supra* note 37, at 14. Thus, the FWS definition is much more inclusive than the Corps definition. For instance, under the FWS definition, a wetland exists if hydrophytic vegetation is present even in the absence of hydric soils or saturated/inundated hydrologic conditions; however, a wetland would not exist under the Corps definition if only the vegetation factor is met. The definitional distinctions are important nationally. The National Wetland Inventory (NWI) utilizes the FWS definition in its reporting of national trends in wetlands, while Corps and NRCS use their own definitions

It is important to note that several other federal laws enhance protections under Section 404. The Fish and Wildlife Coordination Act provides for consultation with FWS and the National Marine Fisheries Service (NMFS) concerning wetland issues.<sup>239</sup> The National Environmental Policy Act, with its public notice requirements, environmental assessments, environmental impact statements, and other "stop and think" provisions operates in concert with Section 404 to protect wetlands.<sup>240</sup> The Endangered Species Act also protects wetlands when wetlands are critical habitat for endangered species.<sup>241</sup>

## B. The Swampbuster Program

The "other" major federal program for the protection of wetlands is the wetland conservation provision of the Food Security Act of 1985.<sup>242</sup> This Act, more commonly known as "Swampbuster," is administered by the Natural Resource Conservation Service (NRCS).<sup>243</sup> Swampbuster, which protects wetlands that are located on agricultural lands, was enacted to fill a gap in wetlands protection that was left by Section 404.<sup>244</sup> Section 404

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for wetland protection. Thus, proponents of the Corps definition would argue that NWI reports concerning wetlands and wetland losses are inflated. Proponents of the FWS definition would argue that, despite the tremendous losses of wetlands to date and a national policy of "no net loss of wetlands," many of the nation's wetlands are unprotected. A similar discrepancy exists between the FWS definition and the definition used by National Resource Conservation Service (NRCS) under the Swampbuster program, which requires the presence of both hydric soils and, in most situations, hydric vegetation. See 16 U.S.C.A. 3822(e) (Supp. 1998).

239. Fish and Wildlife Coordination Act, 16 U.S.C. §§ 661-668ee (1994).

240. See Houck & Rolland, *supra* note 197, at 1258; National Environmental Policy Act of 1969, 42 U.S.C. §§ 4321-4370d (1994); 33 C.F.R. § 325.2(a)(4) (1997) requires either an environmental assessment or environmental impact statement in order to obtain a Section 404 permit.

241. See Houck & Rolland, *supra* note 197, at 1259; 16 U.S.C. §§ 1531-1544 (1994).

242. The Food Security Act of 1985, Pub. L. No. 99-198, 99 Stat. 1354. The wetland conservation provision is codified at 16 U.S.C. §§ 3821-3824 (1994).

243. The NRCS was formerly known as the Soil Conservation Service, or SCS. The Swampbuster Act changed the name. See Daryn McBeth, *Wetlands Conservation and Federal Regulation: Analysis of the Security Act's "Swampbuster" Provisions as Amended by the Federal Agriculture Improvement and Reform Act of 1996*, 21 HARV. ENVTL. L. REV. 201, 232 (1997).

244. See MITSCH & GOSSELINK, *supra* note 10, at 570. Most estimates indicate that Section 404 only regulates about twenty percent of the activities causing wetland losses. See McBeth, *supra* note 243, at 218.

exempts normal agricultural practices from permit requirements,<sup>245</sup> thus, Swampbuster was enacted to fill this gap.<sup>246</sup>

Swampbuster is an incentive program that applies to persons who choose to participate in the program.<sup>247</sup> Rather than levying penalties for disturbing wetlands, Swampbuster denies federal subsidies to farm owners who knowingly convert wetlands to farmlands after the effective date of the Act.<sup>248</sup> These subsidies include price supports, loans, and crop insurance, which are denied for any agricultural commodity crop that is planted in the converted wetland.<sup>249</sup>

NRCS uses yet another regulatory definition of wetlands in implementing the Swampbuster provisions of the Food Security Act:

The term "wetland," except when such term is part of the term "converted wetland," means land that—(A) has a predominance of hydric soils; (B) is inundated or saturated by surface or ground water at a frequency and duration sufficient to support a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions; and (C) under normal circumstances does support a prevalence of such vegetation. For purposes of this Act and any other Act, this term shall not include lands in Alaska identified as having high potential for agricultural development which have a predominance of permafrost soils.<sup>250</sup>

The NRCS definition, not surprisingly, focuses on soils, and indicates that hydric soils must be present for a determination that a wetland exists. The definition also indicates that vegetation must be present, at least under normal conditions. In fact, to determine that a

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245. See 33 U.S.C. 1344(f)(1)(A) (1994). "[T]he discharge of dredged or fill material . . . from normal farming, silviculture, and ranching activities such as plowing, seeding, cultivating, minor drainage, harvesting for the production of food, fiber, and forest products, or upland soil and water conservation practices...is not prohibited by or otherwise subject to regulation..."

246. See MITSCH & GOSSELINK, *supra* note 10, at 570-71; McBeth, *supra* note 243, at 218.

247. The penalty for a Swampbuster violation is a loss of eligibility for certain government loans and payments. See 16 U.S.C. A. § 3821(a), (b) (1998) This is unlike a regulatory program that provides monetary sanctions or even incarceration to penalize violators. Thus, Swampbuster is better characterized as an incentive program rather than a regulatory program, albeit a strong incentive.

248. The effective date of the Act is December 23, 1985. See The Food Security Act of 1985, Pub. L. No. 99-198, 99 Stat. 1354 (enacted on Dec. 23, 1985). See also 16 U.S.C.A. § 3822(b)(1)(A) (1998) (section does not apply to wetlands converted prior to Dec. 23, 1985).

249. See 16 U.S.C. § 3811 (1994). Agricultural commodity crops are sugarcane and crops that require annual tilling of the soil. See 16 U.S.C. § 3801(a)(1) (1994); 7 C.F.R. § 12.2(a)(1) (1998).

250. 16 U.S.C. § 3801(a)(18) (1994).

wetlands exists, NRCS must find that there is a predominance of hydric soils, that inundation or saturation is such that the land supports a prevalence of hydrophytic vegetation, and that there is actually a prevalence of hydrophytic vegetation.<sup>251</sup>

The procedures under the Swampbuster program are somewhat involved. The NRCS must delineate the wetlands on the agricultural areas that are subject to the program. It does this following the guidelines in the National Food Security Act Manual.<sup>252</sup> NRCS may delineate wetlands by conducting either an on-site evaluation, or an off-site evaluation using such tools as soil survey maps, aerial photography, and geological survey maps.<sup>253</sup> After determining the wetland boundaries through delineation, NRCS conducts a wetland determination, in which it determines which parcels of land have restrictions and exemptions.<sup>254</sup>

Restrictions apply generally to lands that provide important wetland functions and values. Restrictions usually prohibit "manipulation" of the wetland, which is altering the hydrology or removing woody vegetation.<sup>255</sup>

Swampbuster includes several exemptions that apply even if a wetland exists. A participant may impact a wetland if the wetland was converted to farmland prior to December 23, 1985,<sup>256</sup> if the farming activity will only have minimal effects on the wetland characteristics,<sup>257</sup> or if the functions and values that will be lost are mitigated by restoration of another wetland.<sup>258</sup> Additionally, Swampbuster also exempts artificial agricultural ponds, wetlands made farmable by drought or other natural conditions, and wetlands for which the farmer can demonstrate undue economic hardship due to conversion expenditures made prior to December 23, 1985.<sup>259</sup>

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251. See 16 U.S.C.A. § 3822(e) (Supp. 1998).

252. See NATIONAL RESEARCH COUNCIL, *supra* note 2, at 69. To assist in application of the jurisdictional definitions, the regulatory agencies have developed delineation manuals to promote consistent identification of wetlands. The Corps and EPA use the 1987 Corps Manual. See CORPS DELINEATION MANUAL, *supra* note 37. NRCS uses its own manual, the National Food Security Act Manual. Both manuals apply their own three-factor definitions, but they do so differently. See NATIONAL RESEARCH COUNCIL, *supra* note 2, at 74. The manuals are organized so differently that comparisons between them are difficult. See *id.* at 88. See generally, *id.* at 74-89.

253. See McBeth, *supra* note 243, at 238.

254. See *id.*

255. See *id.* at 241.

256. See 16 U.S.C. § 3801(a)(6)(A) (1994).

257. See U.S.C.A. § 3822(f)(1) (Supp. 1998).

258. See U.S.C.A. § 3822(f)(2) (Supp. 1998).

259. See 16 U.S.C.A. § 3822(b)(2) (Supp. 1998).



The regulatory agencies have attempted to coordinate Section 404 and Swampbuster. By Memorandum of Agreement, NRCS performs all wetlands delineations on agricultural lands using the Corps' manual for Section 404 delineations and the National Food Security Act Manual for Swampbuster delineations.<sup>260</sup> The Corps and EPA also amended their regulations to exempt prior converted cropland from Section 404.<sup>261</sup>

## VII. THE PLIGHT OF WESTERN WETLANDS UNDER CURRENT FEDERAL LAWS

The federal wetlands laws do not protect all wetlands equally.<sup>262</sup> The laws are geared toward protecting the "classic" wetlands, such as swamps, tidal marshes, and inland marshes. However, many important wetlands are on the edge of protection, not fitting neatly into the regulatory wetland definitions because of their location, unusual characteristics, or regulatory status.<sup>263</sup> Unfortunately, because of dams and stream channelization, there are few classic marsh habitats remaining in the western United States.<sup>264</sup> Most of the remaining western wetlands are the controversial wetlands that are on the edge of protection; sometimes they are protected and sometimes they are not. These wetlands include riparian wetlands, isolated wetlands, headwater wetlands, shallow or intermittently flooded wetlands, and agricultural wetlands.

The most significant shortcoming in federal wetlands law is its failure to protect most western riparian areas. Riparian areas are probably the most common, most widespread, and most important wetlands ecosystem in the interior western United States.<sup>265</sup> However, western riparian "wetlands" often fail to meet the regulatory definitions of "wetlands" and therefore are often unprotected by existing laws.<sup>266</sup>

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260. See NATIONAL RESEARCH COUNCIL, *supra* note 2, at 69-70; 58 Fed. Reg. 45,008 (1993); 33 C.F.R. § 328(a)(8) (1997); 40 C.F.R. §§ 110.1, 112.2, 116.3, 117.1, 122.2, 230.3 (1997).

261. See NATIONAL RESEARCH COUNCIL, *supra* note 2, at 69-70; 58 Fed. Reg. 45,008 (1993); 33 C.F.R. § 328(a)(8) (1997); 40 C.F.R. §§ 110.1, 112.2, 116.3, 117.1, 122.2, 230.3. (1997).

262. This article does not attempt to discuss the shortcomings of Section 404 and Swampbuster protections except to the extent that they afford less protection to western wetlands than to wetlands in general.

263. See NATIONAL RESEARCH COUNCIL, *supra* note 2, at 149. Some estimates indicate that section 404 only regulates 20 percent of activities that cause wetland losses. See McBeth, *supra* note 243, at 219 & n.124.

264. See Winckley & Brown, *supra* note 25, at 225.

265. See generally *id.*; text *infra* Part V(B).

266. The regulatory definitions are the Corps definition used to implement Section 404 and the NRCS definition used to implement Swampbuster.

A comparison of the federal wetlands definitions reveals why they may apply differently to the same wetlands.<sup>267</sup> The regulatory definitions are similar in that they define wetlands based on three factors: hydrology (i.e., frequent inundation or saturation), a prevalence of hydrophytic plants, and the presence of hydric soils. The Corps' wetland delineation manual for Section 404 implementation requires the presence of all three factors for a wetlands determination,<sup>268</sup> and the NRCS Manual for Swampbuster implementation requires a predominance of hydric soils and a prevalence of hydrophytic plants, which are indicative of frequent inundation or saturation.<sup>269</sup> In contrast, the U.S. Fish and Wildlife definition requires the presence of only one of the three factors. Thus, the FWS definition is much more inclusive than the jurisdictional definitions of the Corps and the NRCS.

Riparian areas in the arid west often meet the FWS definition of wetlands but fail to meet the more restrictive jurisdictional definitions used by the Corps, EPA, and NRCS in implementing wetlands protection programs. A riparian area is an ecosystem that is associated with a high water table because of its proximity to an aquatic ecosystem or to subsurface water.<sup>270</sup> Western riparian areas are characterized by hydrophytic vegetation,<sup>271</sup> and in this respect they meet the vegetative factor for wetlands. However, western riparian areas usually have sandy rather than hydric soils, and saturation is often infrequent.<sup>272</sup> Thus, based on vegetation type alone, many riparian areas may meet the FWS definition of wetlands and yet fail to meet the jurisdictional definitions that require the presence of hydric soils and frequent inundation. Therefore, although these riparian areas may be wetlands according to the FWS definition and they may perform many of the same functions as wetlands,<sup>273</sup> they often are not protected as wetlands.

The hydrology factor of the wetlands definition, frequent inundation or saturation, disfavors western wetlands in the arid west. In the past, flooding in western rivers was common, and riparian vegetation thrived along the western rivers and streams. However, flooding is now eliminated throughout much of the west through flood control structures

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267. For the *verbatim* language of the definitions, see the text *supra* Part III(A) (FWS definition), text *supra* Part VI(A) (Corps definition), and text *supra* Part VI(B) (NRCS definition).

268. See CORPS DELINEATION MANUAL, *supra* note 37, at 14.

269. See NATIONAL RESEARCH COUNCIL, *supra* note 2, at 57.

270. See NATIONAL RESEARCH COUNCIL, *supra* note 2, at 289. Western riparian areas are most commonly recognized as bosques or streamside vegetation. See *id.*

271. See *id.* at 155-56, 273-74.

272. See *id.* at 155-56; 273-74.

273. See NATIONAL RESEARCH COUNCIL, *supra* note 2, at 274.

such as dams, levees, and canals.<sup>274</sup> Many of the western hydrophytic species, such as cottonwoods and willows, require flooding to become established but are able to survive in the absence of frequent flooding as long as the water table remains high.<sup>275</sup> Thus, many western streams still retain hydrophytic vegetative characteristics in the absence of frequent inundation, and these riparian areas perform the same functions as wetlands, yet they are not protected because of the absence of the hydrology factor.<sup>276</sup>

The hydric soils factor also disfavors western riparian areas. Western soils, even along watercourses, are usually sandy and well drained rather than hydric.<sup>277</sup> Therefore, riparian areas with a prevalence of sandy soils would not meet the jurisdictional definitions of wetlands even if they were frequently flooded and contained a prevalence of hydrophytic vegetation.<sup>278</sup>

Finally, many western riparian areas may not even meet the "prevalence of hydrophytic vegetation" factor. A riparian area may include many phreatophyte species that can survive where the water table is high, but either the understory vegetation is not hydrophytic, or the phreatophytes are interspersed with enough upland species that the overall vegetation is not predominately hydrophytic.<sup>279</sup> Thus, the situation may exist where a riparian area performs all of the functions of a wetlands but fails to meet any of the three factors used in the wetlands definitions.

The "bosques" of the west demonstrate the classic case in which riparian areas fail to meet the jurisdictional wetlands definitions. The dominant bosque vegetation is a combination of cottonwoods and willows.<sup>280</sup> Cottonwoods and willows become established by flooding; however, once established, they survive for years without recurrence of flooding because their root systems extend into abundant water in the phreatic zone. The understory is often composed of herbaceous plants, often non-phreatic, because the soils are often sandy and well drained

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274. See Winckley & Brown, *supra* note 25, at 225.

275. See NATIONAL RESEARCH COUNCIL, *supra* note 2, at 273. A phreatophyte is a plant with a deep root system that allows it to obtain water from the permanent water table. See *id.* at 288. Plants may be phreatophytes as well as hydrophytes.

276. The common situation is when the riparian area nearest the watercourse meets the definition of wetlands, particularly if it is within the "ordinary high water mark." However, outside of this narrow zone, the riparian area would be unprotected. See *id.* at 273.

277. See *id.* at 155-56, 273-74.

278. See *id.*

279. See *id.* at 155.

280. See *id.*; Table 3 *infra*. Cottonwoods and willows are characteristically classified as hydrophytes. FWS lists four cottonwood species and twenty willow species as phreatophytes in New Mexico alone. See PORTER B. REED, JR., U.S. DEP'T OF THE INTERIOR, NERC-88/18.31, NATIONAL LIST OF PLANT SPECIES THAT OCCUR IN WETLANDS: 1988 NEW MEXICO 16, 18 (1988).

rather than saturated. These riparian areas might not meet any of the factors to qualify as a "jurisdictional wetland" under Section 404 or Swampbuster. Thus, even though these riparian areas perform many if not all of the functions of a "jurisdictional wetland,"<sup>281</sup> they do not meet the regulatory definitions and are thus unprotected by federal law.

In fairness, it is important to note that some parts of riparian areas may meet the jurisdictional definitions of wetlands even if the entire riparian zone does not. Areas that may meet the jurisdictional wetlands definitions are floodplain depressions that are inundated every year, abandoned channel remnants that are saturated from groundwater, and that part of riparian areas closest to the watercourse, especially the area within the "ordinary high water mark."<sup>282</sup> However, it is often the case that much of any given riparian area is unprotected.

The second category of western wetlands that is receiving inadequate protection is isolated western wetlands.<sup>283</sup> Isolated wetlands include playas, potholes, and wetlands in association with springs or seeps. These wetlands are inadequately protected because the Corps' Nationwide Permit 26 allows filling, flooding, excavating, or draining of isolated wetlands of one acre with no review and ten acres with advanced written notification.<sup>284</sup> Environmentalists state that Nationwide Permit 26 is the most destructive regulation confronting isolated wetlands.<sup>285</sup> An estimated 5,000 to 20,000 acres of wetlands have been destroyed each year under Nationwide Permit 26.<sup>286</sup> Thus, despite the fact that these small wetlands are critical parts of the western ecosystem, they are afforded less protection than other wetlands.

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281. See NATIONAL RESEARCH COUNCIL, *supra* note 2, at 274; SULLIVAN & RICHARDSON, *supra* note 149, at 2.

282. See *id.* at 154-55, 273.

283. Isolated wetlands are non-tidal waters that are not part of a surface tributary system. See 33 C.F.R. § 330.2 (1997).

284. See NATIONAL RESEARCH COUNCIL, *supra* note 2, at 155; *The Regulatory Permit Program*, (visited Jan. 27, 1998) <<http://wetland.usace.mil/RPP-bro.html>>. The Corps is proposing to amend Nationwide Permit 26 to require permits for any filling over three acres. Environmentalists as well as some federal agencies (The Environmental Protection Agency, the Fish and Wildlife Service, and the National Marine Fisheries Service) expressed concerns that the new proposal would allow more damage to wetlands than the old permits did by providing the three acre exemption for all wetland development, not just isolated and headwater wetlands. See Joby Warrick, *New Wetlands Guidelines, New Openings; Opponents Say Proposed Rules Favor Developers*, THE WASHINGTON POST, Jan. 31, 1998, at A01.

285. See Susan Bruninga, *Draft Corps Permits Cover Most Wetlands; Environmental Groups Express Outrage*, THE BUREAU OF NATIONAL AFFAIRS, INC. ENVIRONMENT REPORTER CURRENT DEVELOPMENTS, Jan. 30, 1998.

286. See Warrick, *supra* note 284.

Similarly, headwater wetlands, wetlands in the upper reaches of streams, also receive diminished protection.<sup>287</sup> In the western United States, headwaters are often associated with cirque lakes and high-elevation riparian wetlands. These wetlands are important for regulating downstream flow, reducing sediment flux, stabilizing streambanks, and providing wildlife habitat.<sup>288</sup> Nationwide Permit 26 provides the same exemption from permitting for headwater wetlands as it provides for isolated wetlands.<sup>289</sup>

Shallow, intermittent wetlands also are often unprotected because they may only intermittently meet the definitional factors related to hydrology, vegetation, and soils.<sup>290</sup> Intermittent flooding is often a function of the arid western climate where rainfall varies significantly and dry periods can last for several years.<sup>291</sup> These shallow and intermittently flooded wetlands include rock pools, playas, and riparian areas. These types of wetlands can support unique habitats and are also important for controlling floodwaters, reducing peak discharges, and maintaining water quality.<sup>292</sup> They are particularly susceptible to destruction during dry years when they may not be identified as wetlands.

Finally, agricultural wetlands in the west, which may include playas and riparian wetlands, also receive reduced protection. Section 404 exempts agricultural and silvicultural activities from its requirements, leaving such wetlands totally susceptible to conversion to agriculture.<sup>293</sup> Swampbuster compensates for this by providing incentives to farmers not to convert wetlands. However, Swampbuster's wetlands definition is based primarily on hydric soils, which are often not present in western wetlands, particularly riparian areas.<sup>294</sup>

## VIII. STATE PROTECTION OF WETLANDS

Many states are promulgating their own wetlands protection statutes. As might be expected, the states most involved in wetlands regulation are the coastal states. At least twenty-three coastal states have

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287. Headwaters means the point in a stream above which the average annual flow is five cubic feet per second. See *The Regulatory Program* *supra* note 284.

288. See 2 U.S. DEP'T OF THE INTERIOR, *supra* note 21, at 214-15.

289. See *The Regulatory Program*, *supra* note 284.

290. See NATIONAL RESEARCH COUNCIL, *supra* note 2, at 156-57.

291. See *id.*

292. See *id.* An example of a unique habitat is the vernal pools of California that support fairy shrimp. These pools are often dry, especially during the summer. The fairy shrimp eggs remain viable during prolonged drought and hatch rapidly during wet weather. See *id.*

293. See 33 U.S.C. § 1344(f) (1994).

294. See 16 U.S.C.A. § 3822(e) (Supp. 1998).

coastal wetland protection programs.<sup>295</sup> Sixteen states have wetland protection statutes for inland waters.<sup>296</sup> Unfortunately, the only western state with significant inland wetlands protection statutes is Oregon.<sup>297</sup> Arizona, California, and Wyoming also have wetlands protection statutes; however, the provisions are not comprehensive.

Oregon's requirements for "removal and fill" operations provide a comprehensive scheme for protection of inland wetlands. Oregon requires a permit for removing or filling materials in any "waters of this state."<sup>298</sup> "Waters of this state" includes essentially all waters, whether tidal or non-tidal, and whether navigable or non-navigable.<sup>299</sup> The definition also includes wetlands.<sup>300</sup>

Oregon will not issue a permit if the activities would be inconsistent with protection, conservation, and the best use of the water resources.<sup>301</sup> The best use of resources includes domestic, agricultural, industrial, commerce, and transportation uses as well as habitat for fish and recreational uses.<sup>302</sup> In determining whether to issue the permit, Oregon considers public need, economic cost to the public, availability of alternatives, existing public uses, and whether the activity is for streambank protection.<sup>303</sup> The director may impose conditions on the permit as necessary, and "shall" impose measures for mitigation.<sup>304</sup> Mitigation is limited to replacement of the functional attributes of the lost wetland.<sup>305</sup> A host of state agencies provide input into permit conditions and may request closure of specified waters of the state to issuance of permits.<sup>306</sup>

The Oregon program provides several exceptions to permitting requirements for fill or removal operations. The state may grant general

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295. See MITSCH & GOSSELINK, *supra* note 10, at 572-73.

296. See *id.* at 575.

297. See *id.* at 575; OR. REV. STAT. §§ 196.800-196.990 (Supp. 1996).

298. See OR. REV. STAT. § 196.810 (Supp. 1996). Fill or removal is removing more than fifty cubic yards of material. *id.* at § 196.800(5), (12) (1989). A permit is required for any fill or removal, no matter the amount, in essential anadromous salmonid habitat. *id.* at § 196.810(1)(b).

299. See *id.* at § 196.800(14).

300. The Oregon Act defines wetlands similar to the Corps' definition: "Wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that do under normal circumstances support, a prevalence of vegetation typically adapted for life in saturated soil conditions." *id.* at § 196.800(16).

301. See § 196.825(1) (Supp. 1996).

302. See § 196.805(1) (1989).

303. See § 196.825(3).

304. Director of the Division of State Lands. See § 196.800(2).

305. See § 196.825(5).

306. See §§ 196.825(5), 196.840 (1989).

authorization for activities that are similar in nature and that have minimal impacts.<sup>307</sup> The state exempts fill or removal activities within a forestland that are subject to a forest management practice conducted in accordance with other state statutes.<sup>308</sup> The state also exempts certain activities on converted wetlands,<sup>309</sup> including normal farming and ranching activities, minor drainage on an established farm, exclusive farm-use zoned lands, and maintenance of farm roads.<sup>310</sup> The state also exempts maintenance and reconstruction of such things as dams, dikes, levees, ditches, and transportation structures.<sup>311</sup>

Oregon provides enforcement tools and severe penalties for violation of its fill and removal program. Operating without a permit or contrary to permit conditions is deemed a public nuisance.<sup>312</sup> The Director may revoke permits<sup>313</sup> or issue orders requiring activities to cease,<sup>314</sup> or seek remedies at law or in equity to abate public nuisances.<sup>315</sup> The Director may enjoin violators by issuing temporary restraining orders and preliminary injunctions, and may seek compensatory damages for any destruction or infringement of public rights of navigation, fishery, or recreation.<sup>316</sup> Moreover, the Director may seek double damages for negligent violations and treble damages for intentional violations.<sup>317</sup> Violators are also subject to a civil penalty of up to \$10,000 per day of violation.<sup>318</sup>

California has taken a different route to protecting its inland wetlands. Through the California Riparian Habitat Conservation Act, California established the California Riparian Habitat Conservation Program.<sup>319</sup> Rather than regulating activities that impact "rivers, wetlands, and waterways,"<sup>320</sup> California chose to protect and restore riparian habitats

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307. See § 196.850(1) (1989).

308. See § 196.905(2) (1989).

309. The definition of "converted wetlands" is very broad, including wetlands converted prior to June 30, 1989, that are capable of producing an agricultural commodity where production was not possible prior to conversion, or any wetlands that have been manipulated and are capable of producing an agricultural commodity where such production would not have been possible but for such action. See § 960.905(9).

310. See § 960.905(3). The exemptions do not apply if converting wetlands to a non-farm use. See *id.*

311. See § 960.905(6), (8).

312. See § 960.855 (1989).

313. See § 196.865 (1989).

314. See § 196.860(1) (1989).

315. See § 196.870(1) (1989).

316. See § 196.860(1)(f), 196.870.

317. See § 196.875 (1989).

318. See §§ 196.890 (1989), 196.895 (1989).

319. See CAL. FISH & GAME CODE § 1385-1431 (West 1984 & Supp. 1998).

320. See § 1386 (West Supp. 1998).

by acquiring interests and rights in real property and water.<sup>321</sup> Under this program, the Wildlife Conservation Board is authorized to acquire such interests through gift, purchase, lease, easement, or other means.<sup>322</sup> The Board is also authorized to make grants and loans to public agencies, state agencies, federal agencies, and nonprofit organizations for wetland and associated habitat acquisition, restoration, or enhancement.<sup>323</sup>

Arizona also has funding and acquisition programs for protection of riparian areas. The Riparian Trust Fund is funded from monies collected from sale or use of state streambed lands, from other state resources, and from gifts and grants.<sup>324</sup> Arizona uses the Fund monies to acquire land or interests in land located in riparian areas for conservation of wildlife and recreation.<sup>325</sup> Additionally, Arizona funds similar projects for river, stream and riparian habitat restoration through the Arizona Water Protection Fund.<sup>326</sup>

Wyoming's wetlands statute is primarily a policy statement rather than a mechanism for wetlands protection. The "Wyoming Wetlands Act"<sup>327</sup> declares that all water within the borders of the state belongs to the state.<sup>328</sup> It then states the findings of the state legislature that "agriculture, energy development, mining, highway construction, and timbering are important industries in this state and that industrial concerns must be accommodated in the protection of wetlands."<sup>329</sup> The Act also recognizes that wetlands are important and deserve protection.<sup>330</sup> It thus declares the wetlands policy of Wyoming to be "that water management and development and wetland preservation activities should be balanced to protect and accommodate private property, industry, water and wetland interests and objectives."<sup>331</sup> The Act then provides that any person who intends to drain a wetland shall first notify the state.<sup>332</sup> Failure to notify the state results in ineligibility to participate in the state's mitigation credit banking system.<sup>333</sup>

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321. See § 1387 (West Supp. 1998).

322. See § 1390(a) (West Supp. 1998).

323. See § 1390(c) (West Supp. 1998); § 1416 (West Supp. 1998).

324. See ARIZ. REV. STAT. ANN. § 37-1156 (West Supp. 1997).

325. See § 37-1156(B).

326. See § 45-2101 (West Supp. 1997).

327. See WYO. STAT. ANN. §§ 35-11-308 through 35-11-311 (Michie 1997).

328. See § 35-11-309(a).

329. § 35-11-309(b).

330. See § 35-11-309(c).

331. See § 35-11-309(e).

332. See § 35-11-310.

333. See §§ 35-11-310(c), 35-11-311.



## IX. WHO SHOULD PROTECT WESTERN WETLANDS

### A. Federal Protection for Western Wetlands

Twentieth century America looks to the federal government for regional environmental protection. Federal intervention has been necessary in many instances in order to overcome political obstacles to environmental regulation at the state level and to establish a level playing field for interstate business.<sup>334</sup> Federal regulation of environmental concerns also has its drawbacks, often resulting in over or under regulation because of regional differences. Nevertheless, federal environmental regulation has proved effective in many instances, and Americans continue to look to the federal government where environmental protection is concerned.

However, federal protection of western wetlands beyond the current level of protection is unlikely. Mainstream America is concerned that the federal government is too involved in state and local affairs, particularly in environmental regulation, and this mood is reflected in Congress and the federal courts. Thus, while federal regulation is responsible for the protections that wetlands enjoy today, Congress and the federal courts are not likely to expand this protection. The following discussion highlights the mood of Congress and the federal courts that makes expanded protection for western wetlands unlikely.

#### 1. *Wetlands and Congress*

Rather than enhancing protection, the United States Congress is more likely to reduce wetlands protection. This trend toward lessened protection began in the 104th Congress when the gains made in wetlands protection over the last twenty years came close to being swept away. The elections in November 1994 resulted in Republican majorities in both the Senate and the House of Representatives for the first time in forty years.<sup>335</sup> The new Congress, particularly in the House, initiated a legislative "revolution" that included an effort to roll back wetlands protection as well as other environmental protections.<sup>336</sup>

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334. An obstacle to state regulation of environmental concerns has historically been that environmental regulation increases the cost of production, thereby pricing the state out of the national and international market. Federal regulation of all states theoretically places all states on an equal playing field, thereby avoiding market inequities.

335. See James E. Satterfield, *A Funny Thing Happened on the Way to the Revolution: The Environmental Record of the 104th Congress*, 27 ENVTL. L. REP. 10019, 10019 (JAN. 1997).

336. See *id.* at 10021. The 104th Congress revised the Safe Drinking Water Act, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund), the Resource Conservation and Recovery Act, See *id.*, and the Swampbuster

The greatest threat to wetlands under the 104th Congress was attempts to reform the Clean Water Act, including changes that could have significantly affected wetlands protection. Two proposed amendments are particularly noteworthy.<sup>337</sup> One proposal would have redefined wetlands as areas having water on or above the surface for at least twenty-one days during the growing season.<sup>338</sup> The second proposal would have established a classification system implementing a balancing test under which low value wetlands would have received no protection.<sup>339</sup> Fortunately for wetlands, the initiatives failed.<sup>340</sup>

The proposed changes to the Clean Water Act would have been devastating for wetlands. Sixty to seventy-five percent of currently protected wetlands would have lost protection under the proposed wetlands definition.<sup>341</sup> This definitional change, combined with the proposed wetlands classification scheme, would have resulted in the loss of protection for eighty to ninety percent of the wetlands currently protected under Section 404.<sup>342</sup> The remaining five percent of wetlands would have been protected only if they were "scarce within the watershed."<sup>343</sup>

The impact on western wetlands would have been comparable to the nationwide impacts, or perhaps even more severe. A wetland definition requiring water on or above the surface for twenty-one days during the growing season would have eliminated virtually all riparian wetland protection in the west since river channels for the most part are strictly controlled to prevent flooding. Any regulatory change basing protection on wetlands functions and values would disfavor the west because there are few studies specifically relating to western wetland functions and values. Thus, although the potential wetlands losses in the west were not estimated, the losses would have undoubtedly been severe.

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program under the Food Security Act of 1985, *See* McBeth, *supra* note 243, at 254-61.

337. *See* Satterfield, *supra* note 335, at 10030-31. The primary bills to amend the Clean Water Act were H.R. 961 and S. 851. Both bills received strong support in the House, with H.R. 961 passing the House in only three months. *See id.* at 1030.

338. *See id.* at 1031.

339. *See id.*

340. The initiatives failed because of strong opposition from the Clinton Administration, luke-warm support from the Chairman of the Environment and Public Works Committee, and general opposition to radical change from the American people. *See id.* at 10030-33.

341. *See Joint Testimony of the Environmental Protection Agency, Department of the Army, Department of Agriculture, Department of the Interior, Department of Commerce Before the Subcommittee on Clean Air, Wetlands, Private Property and Nuclear Safety of the Committee on Environment and Public Works 2* (visited Apr. 4, 1998) <<http://www.wetlands.com/fed/sb851ts1.htm>> [hereinafter *Joint Testimony*].

342. *See id.* at 3.

343. *See id.* at 4.

The Swampbuster program survived the 104th Congress, but it did not survive unscathed.<sup>344</sup> Congress amended the Swampbuster program through passage of the Federal Agricultural Improvement and Reform Act of 1996.<sup>345</sup> Overall, the amendments to Swampbuster appear to weaken the program.<sup>346</sup> The general theme of the amendments is to broaden some exemptions, make penalties more flexible and less harsh, and make it easier to maintain or regain eligibility through the use of mitigation banks.<sup>347</sup> Whether these amendments actually weaken the program remains to be seen. Nevertheless, these amendments reflect the mood of Congress toward a reduction rather than an increase in nationwide wetlands protection standards.

Fortunately, the 105th Congress let the wetlands reform issue rest. Only two bills were introduced that addressed major wetlands reform,<sup>348</sup> neither of which was enacted into law. One of the bills, H.R. 2762, would have attempted to codify existing wetlands case law to clarify, and in some cases strengthen, wetlands requirements. Another, the Bond-Breaux bill, was supported by pro-development groups who characterized the bill as striking the proper balance between protection and development.<sup>349</sup> Environmental groups were strongly opposed to the Bond-Breaux bill.<sup>350</sup>

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344. Several Republicans wanted major changes, including Congressman Wayne Allard, Chairman of the House Agriculture Committee's Resource Conservation, Research and Forestry Subcommittee. Congressman Allard wanted an outright repeal of Swampbuster. See McBeth, *supra* note 243, at 250-51.

345. Pub. L. No. 104-127, 110 Stat. 888 (to be codified at 16 U.S.C. §§ 3821-2822).

346. The changes to Swampbuster through the Federal Agricultural Improvement and Reform Act of 1996 are detailed in an excellent article by Daryn McBeth. See McBeth, *supra* note 243, at 250-61.

347. See *id.*

348. See Tim Breen, *Wetlands Could Become Part of ISTEA Debate; Little Other Sec. 404 Action Expected*, ENV'T & ENERGY UPDATE, Dec. 19, 1997, at 15, 15-16. Several of the bills introduced dealt with wetlands issues in particular states. For example, H.R. 227 deals with mitigation banking in Florida; S. 49 is the Alaska Wetlands Conservation Act. See *id.* Other bills addressed wetlands issues limited in scope. Additionally, only two congressional hearings on wetlands were held during 1997. Tim Breen, *Most Wetlands Talk, Bills Were Prelude to Clean Water Debate*, ENV'T & ENERGY UPDATE, Nov. 20, 1997, at 46, 46-47. The two hearings concerned recent court rulings and regulatory changes relating to Section 404. One hearing was before the House Water Resources and Environment Subcommittee on April 29, 1997. The other was before the Senate Clean Air, Wetlands, Private Property and Nuclear Safety Subcommittee on June 26, 1997. The first topic of interest to both subcommittees was the Tulloch Rule. See *id.* The Tulloch Rule is discussed *infra* at Section IX(A)(2). The second point of interest to the subcommittees was the Corps announced plans to phase out Nationwide Permit 26. See *id.*

349. See Tim Breen, *Most Wetlands Talk, Bills Were Prelude to Clean Water Debate*, ENV'T & ENERGY UPDATE, Nov. 20, 1997, at 46, 46-47.

350. See *id.*

Thus, although the 105th Congress did not enact significant legislation relating to wetlands, the proponents of wetlands reform continued to develop their positions. Both environmental proponents and pro-development proponents appear to agree that mitigation banking and cost-share incentive programs are valuable tools for wetlands protection, but that is where agreement ends.<sup>351</sup> The proponents of wetland protection would tighten regulation, while the proponents of development would roll back wetland protections to protect only a small fraction of the wetlands that are currently protected. Legislative forecasters predict that the next major battle over wetlands will be in 1999 under the 106th Congress.<sup>352</sup> Additionally, the 1998 elections did not change the face of Congress significantly.<sup>353</sup> Thus, it is unrealistic to expect wetlands reform that would enhance protection of western wetlands.

## 2. *Wetlands and the Courts*

Recent federal court decisions bode trouble for wetlands protection in several areas. First, the courts are limiting the reach of federal jurisdiction under the Commerce Clause as it relates to Section 404 of the Clean Water Act. Second, federal courts appear unwilling to interpret the congressional mandate under Section 404 of the Clean Water Act as broadly as they have in the past. Finally, modern takings jurisprudence that requires compensation to landowners whose property is "taken" by regulations may make government agencies less willing to enforce existing regulations, and certainly less likely to develop new regulations that will result in takings and the subsequent cost to the government. The following is a discussion of each of these judicial restraints on wetlands protection.

Much of the wetland protection that exists today under Section 404 is due to the federal courts, which, through key decisions, compelled the Corps of Engineers and the Environmental Protection Agency to extend the application of Section 404 to wetlands.<sup>354</sup> Thus, the courts set the stage for broad wetlands protection. Ironically, however, recent federal court decisions indicate that the courts are less willing to broadly interpret wetlands protections under Section 404. This is especially true in light of new Commerce Clause jurisprudence that places isolated wetlands,

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351. See Tim Breen, *Wetlands Action Likely to Be Limited to ISTEA Resolution*, ENV'T & ENERGY UPDATE, Jan. 26, 1998, at 34, 34.

352. See *id.*

353. Environmentalists are hopeful that a five-seat gain by the Democrats in the House signals a "greener" Congress. See Jennifer Barsky, *How Green Is New Congress? Leadership Shuffle Will Tell*, ENERGY DAILY (Nov. 5, 1998). However, the Republicans still maintain a majority in both the House and the Senate.

354. See *supra* Part VI(a).

wetlands that are not adjacent to streams, out of the federal regulatory reach.

The seminal case in this new Commerce Clause jurisprudence is *United States v. Lopez*, 514 U.S. 549 (1995). In *Lopez*, the Court applied the Commerce Clause to a federal statute prohibiting the possession of firearms near schools.<sup>355</sup> The Court held that the statute was unconstitutional on Commerce Clause grounds because the activity being regulated, firearm possession near a school, did not "substantially affect" interstate commerce.<sup>356</sup>

Since the Court's ruling in *Lopez*, there has been considerable discussion concerning how the "substantially affects" test will affect federal environmental regulation that relies on the Commerce Clause for the assertion of federal authority.<sup>357</sup> How this plays out is critical to the protection of western isolated wetlands such as inland lakes, prairie potholes, and playas. This is because the only basis for federal protection of these areas is through the Commerce Clause.

To understand why the Commerce Clause is important to wetlands protection, it is necessary to understand the basis for federal jurisdiction over wetlands. Federal jurisdiction over wetlands is asserted through one of two means. Either the wetlands must be adjacent to "waters of the United States,"<sup>358</sup> which brings the wetlands under federal jurisdiction pursuant to the Commerce Clause, or the degradation or destruction of the wetland must somehow affect interstate or foreign commerce.<sup>359</sup> Therefore, regulation of wetlands that are adjacent to water courses readily falls within the reach of the Commerce Clause. However, protection of isolated

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355. See *Lopez*, 514 U.S. at 551.

356. See *Lopez* at 551. "Where economic activity substantially affects interstate commerce, legislation regulating the activity will be sustained." *Id.* at 560.

357. There are several law review articles addressing this topic. See, e.g., Elaine Bueschen, Comment, *Do Isolated Wetlands Substantially Affect Interstate Commerce?*, 46 AM. U. L. REV. 931 (1997); Jonathan G. Hieneman, Note and Comment, *The Shrinking Reach of The Commerce Power: Is Wetland Jurisdiction In Danger?* 10 J. NAT. RESOURCES & ENVTL. L. 341 (1994-95); John A. Leman, Comment, *The Birds: Regulation of Isolated Wetlands and the Limits of the Commerce Clause*, 28 U.C. DAVIS L. REV. 1237 (1995); J. Blanding Holman, IV, Note, *After United States v. Lopez: Can the Clean Water Act and The Endangered Species Act Survive Commerce Clause Attack?* 15 VA. ENVTL. L.J. 139 (1995); Deanne E. Parker, Note, *Will United States v. Lopez Substantially Affect Federal Constitutional Authority to Regulate Isolated Wetlands?*, 16 J. ENERGY NAT. RESOURCES & ENVTL. L. 453 (1996); Richard J. Lazarus, *What Are Waters of the United States? A Commerce Clause Debate*, Wetlands Law and Regulation, Cosponsored by the Environmental Law Institute and the ABA Section of Natural Resources, Energy, and Environmental Law, SA83 ALI-ABA 65, May 29, 1996.

358. See 33 U.S.C. §328.2(a)(7) (1994).

359. See *id.* at § 328.3(a)(3).

wetlands relies on the fact that their destruction could affect interstate commerce.

Courts have justified federal protection of isolated wetlands through application of the "migratory bird rule" that the federal court validated in *Leslie Salt Co. v. United States*.<sup>360</sup> Under this rule, isolated wetlands fall under the jurisdiction of Section 404 because migratory birds use isolated wetlands, and migratory birds are important to commerce.<sup>361</sup>

However, isolated wetlands that are protected by the migratory bird rule may not survive under the *Lopez* Commerce Clause jurisprudence. Justice Thomas, in his dissent on denial of certiorari in *Leslie Salt*,<sup>362</sup> stated that more than an occasional visit by migratory birds was necessary to meet the "substantially affects" test in *Lopez*: "[T]hat substantial interstate commerce depends on the continued existence of migratory birds does not give the Corps *carte blanche* authority to regulate every property that migratory birds use or could use as habitat."<sup>363</sup> Thus, it appears that the migratory bird rule and the isolated wetlands that the rule protects may not survive review by the Supreme Court.

A lower court ruling in United States Court of Appeals for the Fourth Circuit confirms that *Lopez* means trouble for wetlands. In *United States v. Wilson*, the court addressed the felony conviction of a developer who "knowingly discharged fill and excavated material into wetlands of the United States without a permit."<sup>364</sup> Wilson was a developer who ditched and drained a wetland.<sup>365</sup> The wetland was located more than ten miles from the Chesapeake Bay and hundreds of yards from the nearest creek.<sup>366</sup> The jury in federal district court found Wilson guilty of violating Section 404 of the Act.<sup>367</sup>

The Court of Appeals for the Fourth Circuit reversed and remanded the case for a new trial for several reasons. First, the court

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360. *Leslie Salt Co. v. United States*, 896 F.2d 354, 360 (9th Cir. 1990); *Leslie Salt Co. v. United States*, 55 F.3d 1388, 1396 (9th Cir. 1995). *Leslie Salt Co.* involved a determination of whether § 404 applied to artificially created salt pits that were seasonally wet and that attracted migratory waterfowl. The trial court found that the use by migratory waterfowl brought the activity under § 404 by virtue of the Commerce Clause. The court upheld the lower court decision but stated, "The migratory bird rule certainly tests the limits of Congress's commerce powers and, some would argue, the bounds of reason." *Id.* at 1396.

361. See *Leslie Salt Co. v. United States*, 896 F.2d 354, 360 (9th Cir. 1990).

362. *Cargill, Inc. v. United States*, 516 U.S. 955 (1995). This case arose when a new owner of *Leslie Salt* sought Supreme Court review of the 9th Circuit decision in *Leslie Salt Co. v. United States*, 55 F.3d 1388 (9th Cir. 1995).

363. *Cargill*, 516 U.S. at 955 (1995).

364. *United States v. Wilson*, 133 F.3d 251, 253 (4th Cir. 1997).

365. See *id.* at 254.

366. See *id.* at 257.

367. See *id.* at 255.

concluded that 33 U.S.C. Section 328.3(a)(3) is invalid because, by including waters whose degradation "could affect" interstate commerce, it violated the Commerce Clause.<sup>368</sup> This was because "could affect" interstate commerce as provided in the regulation allowed regulation of wetlands that would not pass muster under the "substantially affects" interstate commerce test adopted in recent "federalism jurisprudence."<sup>369</sup> Second, the court found that the Corps' jurisdiction can extend only to wetlands adjacent to "waters of the United States," and not to waters that are not closely connected to interstate or navigable waters, and which do not otherwise affect interstate commerce.<sup>370</sup> Finally, the court found that removing native soil from a ditchline and redepositing it immediately adjacent and within the wetland did not constitute a discharge into the wetland.<sup>371</sup>

The Commerce Clause aside, it appears that the federal courts may simply interpret the plain language of Section 404 more narrowly than they have in the past, further limiting federal protection of wetlands. The decision in *American Mining Congress v. United States Army Corps of Engineers* further demonstrates this point.<sup>372</sup> *American Mining Congress* involved a challenge to the Corps' "Tulloch Rule."<sup>373</sup> The Corps adopted the Tulloch Rule in order to settle a 1991 North Carolina lawsuit.<sup>374</sup> In the North Carolina *Tulloch* case, a developer prevented a discharge from

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368. See *id.* at 253-54.

369. See *id.* at 256.

370. See *id.* at 258.

371. See *id.* at 259. The court also reversed the lower court's decision based on the government's failure to apply *mens rea* to each element of the offense. See *id.* at 265. The Fourth Circuit Court of Appeals could easily have found that the Commerce Clause supported federal jurisdiction in *Wilson*. Current Commerce Clause jurisprudence does not necessarily dictate the 4th Circuit finding. In applying the "substantially affects" test, the Court in *Lopez* looked first at whether the activity was a commercial activity. See *United States v. Lopez*, 514 U.S. 549, 559 (1995). The Court reviewed the precedent upholding federal jurisdiction under the Commerce Clause for activities such as intrastate coal mining, intrastate credit transactions, restaurants using interstate supplies, hotels catering to interstate guests, and producing and consuming home-grown wheat. See *id.* In *Lopez*, the Court found that possession of a gun near a school was not a commercial activity and thus not supported by this line of cases. See *id.* at 561. In *Wilson* the court appears to ignore the fact that the developer who filled in the wetlands was engaged in a commercial activity. The court could have looked no further than this to sustain federal jurisdiction under the Commerce Clause. In the line of cases cited by the Court in *Lopez*, the fact that the activity was a commercial activity satisfied the constitutional requirements.

372. See *American Mining Congress v. United States Army Corps of Eng'rs*, 951 F. Supp. 267 (1997), *aff'd* 145 F.3d 1399 (1998).

373. See *American Mining Congress*, 951 F. Supp. at 269.

374. *North Carolina Wildlife Federation v. Tulloch*, Civil No. C90-713-CTV-5-BO (E.D.N.C. 1992).

dredged material and thus avoided Section 404 jurisdiction by carefully excavating material from a wetland, hauling it in sealed trucks, and disposing of the excavated material outside the wetlands.<sup>375</sup> To prevent future circumvention of Section 404 in this manner, the Tulloch Rule revised the term "discharge of dredged material" to include any addition or redeposit of dredged materials, including excavated materials, into waters of the United States, including mechanized landclearing, ditching, channelization, and other excavation that would destroy or degrade waters of the United States.<sup>376</sup> This would bring ditching and draining activities under Section 404 because of "incidental fallback," the small but unavoidable spilling of dredged material back into the wetland during excavation.<sup>377</sup>

The court in *American Mining Congress* granted summary judgment to the plaintiffs, finding that the Corps' regulation was inconsistent with the Clean Water Act.<sup>378</sup> The court found that Congress intended to regulate the placement of dredged material into water, not the removal of dredged material,<sup>379</sup> that "discharge of dredged material" excludes small-volume incidental discharge from excavation and land-clearing activities,<sup>380</sup> and that Section 404, up to this point, has been interpreted as regulating discharge of dredged material, not the dredging itself.<sup>381</sup> To define fallback as a discharge of dredged material would, in effect, "be adding the regulation of dredging to Section 404 which we do not believe was the intent of Congress."<sup>382</sup> Thus, the court narrowly interpreted Section 404 to limit the reach of federal regulation of wetlands.<sup>383</sup>

Another judicial impediment to wetlands protection that is developing in the courts is takings jurisprudence. Takings jurisprudence has the potential to play a significant role in wetlands protection, not because it prohibits wetlands protection, but because it makes it too costly for the public to protect wetlands.

Takings jurisprudence is based on Fifth Amendment rights under the United States Constitution. The Takings Clause of the Fifth Amend-

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375. See *American Mining Congress*, 951 F. Supp. at 269.

376. See *id.* at 269-70.

377. See *id.* at 270 n.3.

378. See *id.* at 269-70.

379. See *id.* at 272.

380. See *id.* at 273.

381. See *id.* at 274.

382. See *id.*

383. The decision was upheld on appeal. See *National Mining Assn. v. United States Army Corps of Eng'rs*, 145 F.3d 1399, 1404 (1998) ("We agree with the plaintiffs, and with the district court, that the straightforward statutory term 'addition' cannot reasonably be said to encompass the situation in which material is removed from the waters of the United States and a small portion of it happens to fall back.").



ment mandates that private property shall not be taken for public use without just compensation.<sup>384</sup> A regulatory taking occurs if: "(1) there was a denial of economically viable use of the property as a result of the regulatory imposition; (2) the property owner had distinct investment-backed expectations; and (3) it was an interest vested in the owner, as a matter of state property law, and not within the power of the state to regulate under common law nuisance doctrine."<sup>385</sup>

The Federal Circuit's application of the takings test in *Loveladies Harbor* illustrates the impact of takings jurisprudence on wetlands protection. Loveladies was a developer on Long Beach Island, New Jersey.<sup>386</sup> Prior to 1972, Loveladies began developing a 250-acre tract of land for residential homes.<sup>387</sup> In order to develop the remaining fifty-one acres, Loveladies needed to fill fifty acres of wetlands.<sup>388</sup> Pursuant to a settlement agreement with the New Jersey Department of Environmental Protection, Loveladies agreed to limit its fill to 12.5 acres; however, the Corps denied Loveladies' Section 404 permit application.<sup>389</sup> Loveladies filed suit, claiming that the permit denial constituted a Fifth Amendment takings requiring just compensation.<sup>390</sup> The lower court concluded that a taking had occurred, finding that the permit denial reduced the fair market value of the property by more than 99 percent, from \$2,658,000 to \$12,500.<sup>391</sup>

On appeal, the Federal Circuit applied the *Lucas* test and found that a taking had occurred. Under the first criterion, the Court reasoned that Loveladies was clearly denied an economically viable use of its property, and the remaining de minimis value of the property constituted a total taking.<sup>392</sup> Secondly, the court found that Loveladies had distinct, investment-backed expectations, thereby satisfying the second criterion.<sup>393</sup> Finally, the court found that it did not need to work out the nuances of the third criterion—the question of whether, under state law, the regulatory imposition goes beyond common law nuisance doctrine and thus constitutes a taking.<sup>394</sup> The court simply found that the state had never even

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384. U.S. CONST. AMEND. V.

385. *Loveladies Harbor, Inc. v. United States*, 28 F.3d 1171, 1179 (Fed. Cir. 1994). The Federal Circuit derives this test from the lead case in modern takings jurisprudence, *Lucas v. South Carolina Coastal Council*, 505 U.S. 1003 (1992).

386. *See id.* at 1174.

387. *See id.*

388. *See id.*

389. *See id.*

390. *See id.*

391. *See id.* at 1175-76.

392. *See id.* at 1181-82.

393. *See id.* at 1179.

394. *See id.* at 1182.

considered whether the development activities would violate the state's nuisance powers.<sup>395</sup>

*Loveladies Harbor* sets a precedent for finding that a taking occurs when developers are prevented from filling wetlands, thereby shifting the cost of wetlands protection to the public. Many would argue that the public should bear the cost. Nevertheless, regulatory agencies are less likely to diligently enforce wetlands protection regulations if it is likely to result in a taking. Thus, the result is lessened protection for wetlands.

Based on these cases, it appears that the courts are prepared to draw the line on, or even roll back, the wetlands protections that have developed under Section 404. This movement could have dramatic impacts on wetlands nationwide, including the scarce and fragile wetlands remaining in the arid west.

Thus, based on the mood of Congress and the courts, the extension of federal protections for western wetlands is unlikely. Moreover, given the tenuous protection now afforded by federal law and regulation, it is prudent to seek alternate means of protection.

## B. State Protection as an Alternative for Western Wetlands

There are many good reasons why states should take the lead in wetlands protection. States have experience in managing environmental programs; they are in a position to resolve local conflicts in a flexible manner; and they can identify the local economic and other factors that lead to wetland losses.<sup>396</sup> States can also work with local governments to

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395. See *id.* at 1183. *Loveladies* raises several key questions in applying the Lucas test. First is whether a partial taking is compensable. The Federal Circuit hedged the question, finding that a de minimis residual value was a total taking. The case also raises the question of what to consider the "denominator parcel" in calculating the percentage reduction in value of the land. This is important because limiting the denominator parcel to the area to be permitted can result in a total taking, while considering the entire development as the denominator parcel will result in a smaller taking. In *Loveladies*, the court considered only the 12.5 acres to be permitted as the denominator parcel. See *id.* at 1181. However, the court's determination in this regard may be limited to the facts of the case because, considering the prior settlement agreement in which *Loveladies* relinquished the right to develop all but the 12.5 acres, it was illogical to include this acreage in the calculation. See *id.* For a thorough discussion of the determination of the denominator parcel, also called the "nonsegmentation principle," see *K & K Constr., Inc. v. Department of Natural Resources*, 575 N.W.2d 531, 536-38 (1998) (Determining the size of the denominator parcel is inherently a factual inquiry requiring consideration of such factors as contiguity of parcels, common ownership, and comprehensive development plans.). Additionally, for a suggestion of how to avoid a takings finding, see Paul Sarahan, *Wetlands Protection Post-Lucas: Implications of the Public Trust Doctrine on Takings Analysis*, 13 VA. ENVTL. L.J. 537 (1994).

396. See WORLD WILDLIFE FUND, STATEWIDE WETLANDS STRATEGIES A GUIDE TO PROTECTING AND MANAGING THE RESOURCE 2 (1992).

integrate wetlands protection with land use planning.<sup>397</sup> States are also in a better position to muster political support for wetlands protection at the local level.<sup>398</sup>

However, states confront two major impediments when implementing wetlands protection programs. The first is politics. Political support for environmental initiatives at the state level is often difficult to achieve in the face of pressure for economic development.<sup>399</sup> The second is money. States are reluctant to implement costly regulatory programs and generally rely on federal funding for such programs. In determining the best alternative for state involvement in wetlands protection, the benefits as well as the impediments must be considered.

There are several methods that states can use to protect wetlands. States can purchase critical wetlands, establish independent state regulatory programs, assume primary authority for enforcement of federal programs, participate in federal cost-share programs, or establish conservation easement programs. The first alternative, purchase of critical wetlands, is probably cost-prohibitive for most states. The second alternative, independent state regulatory programs, is often not politically favorable, especially when added to established federal programs that many think are already too burdensome.<sup>400</sup> Thus, for most states, the best alternatives are to assume primary authority for enforcement of federal programs, to participate in federal cost-share programs, or to establish conservation easement programs.

Unfortunately, the opportunity for states to assume primary authority for enforcement of federal wetlands protection programs is currently limited to only a few program activities under Section 404.<sup>401</sup> Section 404(g) and (h) provides for states to assume partial jurisdiction for the review and issuance of individual permits.<sup>402</sup> States may also assume jurisdiction for general permits under Section 404(e), called Statewide Programmatic General Permits (SPGP).<sup>403</sup>

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397. *See id.*

398. *See id.*

399. *See* Houck & Rolland, *supra* note 197, at 1309.

400. The current lack of state regulatory wetlands programs in the interior west is probably due at least in part to disfavor of current federal regulatory restrictions on development. *See* Section VIII *supra* for a discussion of state programs for wetlands protection. In particular, the Wyoming program demonstrates the political disfavor in which regulatory programs are held.

401. *See* 33 U.S.C. § 1344 (1994).

402. *See* 33 U.S.C. § 1344(g), (h). *See* Houck & Rolland, *supra* note 197, at 1266-89 for a detailed discussion.

403. *See* 33 U.S.C. § 1344(e); *See* Houck & Rolland, *supra* note 197, at 1282-83.

The interest in state assumption of these programs has been limited. EPA has granted authority to only two states under Section 404(g)—Michigan and New Jersey.<sup>404</sup> As of 1992, fifteen states were administering SPGPs.<sup>405</sup> The difference in participation in the two programs may be a function of the degree of federal scrutiny.<sup>406</sup> Under both programs, states are subject to federal program approval and oversight; however, the scrutiny by EPA under Section 404 (g) and (h) is much greater than the Corps' scrutiny of SPGPs.<sup>407</sup> This is due to the nature of the permits; permits under SPGPs are de minimis by definition and the Corps is delegating a permit review to states that it does not exercise to begin with.<sup>408</sup>

There are advantages and disadvantages to the delegation of Section 404 programs to the states. The advantages are that states can provide localized service and better decision-making because of more on-site review of applications.<sup>409</sup> The main disadvantage is that the political climate in some states inhibits strong enforcement, which is particularly a problem with a program as controversial as the 404 Program.<sup>410</sup> This is not surprising, considering that the need for a federal 404 Program, and the Clean Water Act for that matter, was that the states were not adequately protecting the waters of the United States.<sup>411</sup> Other problems in program delegation include the slow process of obtaining state and federal approval for the programs, funding, and subjecting states to potential liability for takings.<sup>412</sup> The fact that the 404 Program has had several years to develop and is now well established also argues against changing the status quo.<sup>413</sup>

Perhaps the better alternative for federally-assisted state wetlands programs is through cost-share programs. The Environmental Protection Agency administers several cost-share programs to assist states in developing and implementing wetland protection programs. Since 1990, EPA has administered a State Wetlands Grant Program.<sup>414</sup> Congressional funding for the program increased from \$1 million in 1990 to \$15 million in 1995.<sup>415</sup> The grant funds can be used to enhance existing or to develop

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404. See Houck & Rolland, *supra* note 197, at 1268.

405. See *id.* at 1283.

406. See *id.*

407. See *id.* at 1268, 1282-83, 1285.

408. See *id.* at 1285.

409. See *id.* at 1275.

410. See *id.* at 1274.

411. See *id.* at 1309.

412. See *id.* at 1288.

413. See *id.* at 1309-10.

414. See U.S. Environmental Protection Agency, *State Wetlands Grant Program*, (visited Apr. 8, 1998) <<http://www.epa.gov/OWOW/wetlands/facts/fact17.html>>.

415. See *id.*

new wetlands programs.<sup>416</sup> Since its inception every state has received at least one grant.<sup>417</sup>

EPA also administers a program to assist states in developing State Wetland Conservation Plans (SWCP).<sup>418</sup> A SWCP is a strategy to identify needs and goals for wetlands protection, to inventory wetlands, and to implement protection plans.<sup>419</sup> EPA provides financial and technical assistance under this program.<sup>420</sup> Nineteen states are currently developing SWCPs.<sup>421</sup> The only western states with arid/semiarid regions that are participating in this program are California, Montana, Oregon, and Washington.<sup>422</sup>

States can also implement wetlands protection programs using EPA's Clean Water State Revolving Fund Program.<sup>423</sup> Under this program, EPA provides grants to all fifty states to capitalize state loan funds.<sup>424</sup> In turn, the states can make loans to fund community and individual water-quality activities, including activities that benefit wetlands.<sup>425</sup>

In addition to EPA programs, the Department of the Interior (DOI) also administers cost-share programs that states can utilize to preserve wetlands. For example, DOI administers a grant program under the Land and Water Conservation Fund to assist state and local governments in developing outdoor recreation facilities, giving special consideration to wetlands.<sup>426</sup> DOI also administers grant programs under the Pittman-Robertson Wildlife Restoration Act<sup>427</sup> and the Dingell-Johnson Sport Fish Restoration Act<sup>428</sup> that provide federal funds that could be used for wetlands protection programs.

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416. See *id.*

417. See *id.*

418. See U.S. Environmental Protection Agency, *Why Develop a State Wetlands Conservation Plan?*, (visited Apr. 8, 1998) <<http://www.epa.gov/region04/waterpgs/region04wet/swcp.html>>.

419. See *id.*

420. See *id.*

421. See *id.*

422. See *id.*

423. See U.S. Environmental Protection Agency, *The Clean Water Act State Revolving Fund Program*, (visited Apr. 8, 1998) <<http://www.epa.gov/OWM/factsht2.htm>>.

424. See *id.*

425. See *id.*

426. See 16 U.S.C. §§ 4601-4 to 4601-11 (1994); 16 U.S.C. § 4601-8(c) (state grant program); Edward J. Heisel, *Biodiversity and Federal Land Ownership: Mapping a Strategy for the Future* 25 *ECOLOGY L. Q.* 229, 264-79 (1998) (description of the Land and Water Conservation Fund).

427. 16 U.S.C. § 669 (1994).

428. 26 U.S.C. § 9504 (1994).

Finally, states may choose to implement state conservation easement programs as a method of wetlands protection.<sup>429</sup> Conservation easements are appealing because landowner participation is voluntary and because easements are flexible and can be tailored to the needs of the state and the landowner.<sup>430</sup> At least sixteen states and the District of Columbia have adopted conservation easement statutes based on the Uniform Conservation Easement Act.<sup>431</sup> While these statutes allow the purchase of easements for the protection of a variety of values, a state could model a statute after the Uniform Act but tailor it to more narrowly focus on protection of wetlands.

Thus, there are several opportunities for state initiatives in wetlands protection programs. Given the political and economic realities, perhaps the most viable alternatives are federal cost-share programs and conservation easement programs. This is because these alternatives are the least costly to state taxpayers and they are more politically palatable because they intrude minimally on landowner rights.

### C. Local Public and Private Entities as an Alternative for Protecting Western Wetlands

Local public and private entities can contribute significantly to wetlands protection on an opportunistic, small-scale basis. Local public and private entities include municipalities and other local governments, conservancy and irrigation districts, environmental groups, private corporations, and individual landowners.

Local governments can adopt many of the same alternatives that are available to states for wetlands protection. Local governments can raise revenues to purchase wetlands in the same manner that they purchase parks and other open space. They can protect wetlands through zoning ordinances. The purchase of conservation easements is also an alternative. Of course, each of these alternatives has drawbacks. Purchasing wetlands is expensive. Zoning restrictions impose politically unfavorable restrictions on landowners and may also result in a constitutional "taking,"<sup>432</sup> which could prove costly. Thus, conservation easements may prove to be the better alternative in many cases, striking a balance between cost considerations and landowner rights.

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429. A conservation easement is a private use restriction entered into to protect the environment. See John L. Hollingshead, *Conservation Easements: A Flexible Tool for Land Preservation*, 3 ENVTL. LAW 319, 322 (1997).

430. See *id.* at 322-23.

431. See *id.* at 335. Uniform Conservation Easement Act, 12 U.L.A. 170 (1996).

432. See *infra* Section IX (A)(2) for a discussion on "takings."

Perhaps individual landowners have the greatest opportunity to protect wetlands. For example, individuals and corporations can donate land to government or charitable organizations in exchange for tax benefits.<sup>433</sup> Individuals can also participate in conservation easement programs that protect wetlands.<sup>434</sup> There are several programs available. For instance, the U. S. Department of Agriculture (USDA) administers the Wetlands Reserve Program, which allows landowners to sell conservation easements to USDA or enter into 30-year easements.<sup>435</sup> USDA also administers the Water Bank Program, which allows landowners to enter into wetlands conservation agreements with USDA whereby the landowner receives annual payments in exchange for protecting wetlands that are important to waterfowl.<sup>436</sup> These programs are beneficial to landowners as well as the wetlands that are protected. Not only do landowners receive payments for entering into the easement or agreement, but landowners may qualify for certain tax benefits as well.<sup>437</sup>

There are many opportunities for environmental groups to protect wetlands. Environmental groups may purchase wetlands and conservation easements. Perhaps one of the most significant roles for environmental groups is raising public awareness of the value of wetlands. And, of course, environmental groups as well as private citizens may "police" the regulatory agencies and developers to ensure that the current wetlands statutes and regulations are enforced.<sup>438</sup>

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433. See Ian Bowles et al., *Economic Incentives and Legal Tools for Private Sector Conservation*, 8 DUKE ENVTL. L. & POL'Y F. 209, 220-26 (1998).

434. A conservation easement is a private use restriction entered into to protect the environment. See Hollingshead, *supra* note 429, at 322.

435. 16 U.S.C. § 3837 (1994). See Bowles et al., *supra* note 433, at 212-17; J. Brian Smith, *Federal Programs for Aquatic Ecosystem Restoration* 45 (1998) (on file with the Western Water Policy Review Advisory Commission).

436. See Bowles et al., *supra* note 433, at 17-19.

437. See *id.* at 221-22; Hollingshead, *supra* note 429, at 337-60. There are also federal assistance programs for landowners interested in wetlands restoration. For instance, the Partners for Fish and Wildlife Program, administered by the U.S. Fish and Wildlife Service, provides technical and financial assistance to landowners who want to restore wildlife habitat, including wetlands and riparian areas. See U.S. Fish & Wildlife Service, *Partners for Fish and Wildlife* (visited Nov. 27, 1998) <<http://www.fws.gov/r9dhcpfw/OVERVIEW/overview.html>>.

438. Citizen enforcement of Section 404 and other federal wetlands protection statutes is a complex area that is beyond the scope of this paper. Jurisdictions are split on whether the citizen suit provision of the Clean Water Act, 33 U.S.C. § 1365(a)(2) (1994), applies to the Corps' activities under Section 404. Some jurisdictions hold that the citizen suit provision applies only to EPA and does not apply to the Corps. See *Hill v. Boy*, 144 F.3d 1446, 1449 n.7 (11th Cir. 1998); *Preserve Endangered Areas of Cobb's History, Inc. v. United States Army Corps of Eng'rs*, 87 F.3d 1242, 1249 (11th Cir. 1996); *Coeur D'Alene Lake v. Kiebert*, 790 F. Supp. 998, 1008 (D. Idaho 1992). However, the Fourth Circuit Court of Appeals holds that the

## X. CONCLUSION

The wetlands of the interior west are a valuable, though fragile, natural resource. While the functions and values of western wetlands are recently discovered, much remains to be learned. The more that wetland professionals learn about western wetland functions, the more they realize that it is critical to protect the remaining western wetlands. The interior western United States can not afford further losses of this scarce, valuable, and often irreplaceable natural resource upon which most western flora and fauna depend for their very existence.

Many of the wetlands of the interior west enjoy only limited protection under current federal law. This is because of the unique characteristics of these wetlands relating to climate, hydrology, soils, vegetation, and location and which often results in failure of these wetlands in meeting the restrictive federal regulatory definitions. Thus, additional protections are needed to protect wetlands of the interior west. This is true particularly for western riparian areas that serve the same functions as regulatory wetlands, that may meet the scientific definition, but nevertheless are not protected because they do not meet the regulatory definitions of wetlands based on hydrology, hydric soils, and hydrophytic vegetation. Additionally, isolated western wetlands need additional protection because they are in jeopardy of losing current protection

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citizen suit provision does apply to the Corps. See *National Wildlife Federation v. Hanson*, 859 F.2d 313, 316 (4th Cir. 1988). Moreover, the citizen suit provision may apply only to violations of effluent limitations and not to permitting violations. See *Save Our Community v. United States Environmental Protection Agency*, 971 F.2d 1155, 1161, 1163 (5th Cir. 1992) (citizen suit provision applies to Section 404 only with respect to a discharge of dredge or fill material and not to whether or not a permit is required).

Even more complex is the enforcement of Section 404 by individuals or environmental groups against other non-governmental entities, such as through a theory of "negligence per se." Most jurisdictions hold that violation of a federal statute is not negligence per se where the statute does not contain a private right of action. See e.g. *Elliott v. S.D. Warren Co.*, 134 F.3d 1, 4 (1st Cir. 1998) (three of four federal circuits have held that OSHA regulations do not create a private right of action and thus violation of an OSHA regulation is not negligence per se); *Schwartzman, Inc. v. Atchison, Topeka & Santa Fe Railway Co.*, 857 F. Supp. 838, 848 (1994) (negligence per se is not sustainable if the statute does not provide a private right of action). However, Section 404 has been used successfully to support a "negligence per se" action against the Corps. See *Hurst v. United States*, 739 F. Supp. 1377, 1380-81 (D.S.D. 1990) (Corps' failure to enforce its own regulations was negligence per se under South Dakota law). It is possible that violators of wetland statutes may be reached more easily under common law theories of negligence, trespass, and public and private nuisance. For an analysis of citizen enforcement of wetlands statutes, see Derb S. Carter, Jr., *Citizen Enforcement of Federal Wetlands Law*, A.L.I.-A.B.A. COURSE OF STUDY MATERIALS WETLANDS LAW AND REGULATION (May 29-31, 1996).



through the federal courts' narrowing interpretation of the Commerce Clause.

Additional federal protection for western wetlands is unlikely because of the movement in the courts and Congress to diminish federal reach into the regulation of private land. Thus, the western states should take the initiative to supplement federal wetland protection with state programs. States can be particularly effective in administering their own programs because of their ability to identify local problems and to implement local solutions, to garner local support, and to incorporate wetland protection into other state land use programs. However, states are also limited by costs and the public's disfavor of regulatory programs. Thus, the best alternatives for states may not be regulatory programs but programs that strike a balance between cost and regulatory intrusion onto private land. Such programs may include participation in federal cost-share programs and programs for the purchase of conservation easements. Local governments may also be able to use conservation easement programs effectively to protect valuable local wetlands.

From the cirque wetlands nestled below the peaks of the Rockies to the riparian forests of California's Central Valley, and from the high-plains playas of New Mexico to the potholes of Washington, the arid and semi-arid west is dependent on wetlands. Protection of the scarce, fragile, and often unique wetlands of the interior western United States is imperative.

J. BRIAN SMITH

TABLE 1

Wetland Losses in the Arid and Semi-Arid Western States<sup>439</sup>

State	Estimates of Original Wetlands (1780s) (acres)	Estimates of Existing Wetlands (1980s) (acres)	Percent of Wetlands Lost
Arizona	931,000	600,000	36
California	5,000,000	454,000	91
Colorado	2,000,000	1,000,000	50
Idaho	877,000	385,700	56
Montana	1,147,000	840,300	27
Nevada	487,350	236,350	52
New Mexico	720,000	481,900	33
Oregon	2,262,000	1,393,900	38
Utah	802,000	558,000	30
Washington	1,350,000	938,000	31
Wyoming	2,000,000	1,250,000	38

<sup>439</sup>See Thomas E. Dahl, U.S. DEP'T OF THE INTERIOR, WETLANDS LOSSES IN THE UNITED STATES 1780S TO 1980S, at 6 (1990).