

New Directions for Wetland Mitigation and Implications for the Nation's Waters

by Holly V. Campbell

Editors' Summary: Many parties and factors are participating in shaping the future of wetland loss mitigation. Considerations of the status and viability of the "no net loss" wetlands policy are urgent in light of increasing population and urban development. In this Article, Holly Campbell examines U.S. wetlands law and policy, particularly the role of mitigation. She begins the Article with some background information on wetlands compensatory mitigation and where it fits within the law. She describes the 2001 National Research Council findings and recommendations regarding wetlands mitigation, and concludes with her observations and predictions for the long-term future of wetlands, mitigation, and what may be necessary to achieve a net gain in wetland functions across the United States.

I. Introduction

In the lower 48 states of the United States, wetland landscapes account for 26% greater area than all other combined aquatic habitats.¹ The U.S. Environmental Protection Agency (EPA) estimated in 1999 that 40% of species listed as threatened or endangered under the Endangered Species Act² lives in wetland ecosystems.³ Moreover, North American freshwater wetlands are highly productive ecosystems, featuring among the highest regional fauna densities and biodiversity compared with other systems.⁴

U.S. wetland law is exacting and difficult. Wetlands, as regulatory subject matter, are not easily defined. There are several different types of wetlands known by a nomenclature that is mainly colloquial or local in origin and stands for different wetland types in different regions.⁵ Moreover,

wetlands are highly variable within and between each type, depending upon the specific location of wetlands in the landscape and attendant geological, hydrological, and climate factors and seasonal ebb-and-flow influences.⁶ Because of these factors, and also because of the competitive drive to derive profit from uses of land that are in conflict with their ecology and watershed functions, wetlands are a subject matter that is often controversial and difficult to grasp for laypeople, lawyers, and even scientists and managers.⁷

Regardless of type, these ecosystems contribute crucial functions, values, and services to their surrounding watersheds and the people that live in them.⁸ These contributions include habitat and dispersal corridors for many species, improvement of water quality through pollutant removal, control of flood waters, recharge of precious groundwater, and cooling and humidification of their location. Wetlands play an important role in the planet's atmospheric systems be-

Holly V. Campbell earned her J.D. from the University of Oregon in 1991, and her L.L.M. from the University of Utah in 2006. The author wishes to thank the following: Robert W. Adler, James I. Farr Professor of Law; Robert B. Keiter, Professor of Law and Director, Wallace C. Stegner Center for Land, Resources, and the Environment, University of Utah; and Chris Luecke, Professor and Head, Watershed Sciences, Utah State University.

1. THE NATIONAL RESEARCH COUNCIL (NRC), ECOLOGICAL INDICATORS FOR THE NATION 71 (2000) [hereinafter NRC ECOLOGICAL INDICATORS].
2. 16 U.S.C. §§1531-1544, ELR STAT. ESA §§2-18.
3. Office of Wetlands & Watersheds, U.S. Environmental Protection Agency (EPA), *Functions and Values of Wetlands*, <http://www.epa.gov/owow/wetlands/functions.html> (last visited Dec. 17, 2006).
4. NRC, COMPENSATING FOR WETLAND LOSSES UNDER THE CLEAN WATER ACT 39-40 (National Academy of Sciences 2001) [hereinafter NRC COMPENSATING FOR LOSSES].
5. JON KUSLER & TERESA OPHEIM, OUR NATIONAL WETLAND HERITAGE 15-19 (2d ed. 1996).

6. *Id.* at 5-6. This is due to differences in climate, region, and season, among other factors. Because wetlands are by nature transitional, gradient zones between aquatic and upland systems, it is difficult to determine an exact perimeter where they begin and end. *See also id.* at 43.

7. For study and inventory purposes, there are two major scientific classification systems for categorizing wetland types. However, due to the widely varying characteristics of real wetlands noted above, textbook definitions are of limited use and must be applied with care, and in keeping with a specific purpose. For example, the requirement of hydrophytic (water-loving) vegetation is not necessarily useful to a scientist who is engaged in delineating wetlands for aerial mapping. *See* WILLIAM J. MITSCH & JAMES G. GOSSELINK, WETLANDS 72-80 (John Wiley & Sons, Inc. 3d ed. 2000) [hereinafter MITSCH & GOSSELINK, WETLANDS].

8. Wetlands also "contribute to the stability of global levels of available nitrogen, atmospheric sulfur, carbon dioxide, and methane." *Id.* at 571-609.

cause they provide important services that counteract urban heat-island effects, greenhouse gas emissions, and global warming. Wetlands worldwide are estimated to store 400 billion tons of carbon⁹ and “contribute to the stability of global levels of available nitrogen, atmospheric sulfur, carbon dioxide, and methane.”¹⁰ Wetlands also provide scientific, scenic, recreational, and aesthetic opportunities.¹¹ Despite wetlands’ importance, throughout the nation’s history wetland functions in the landscape have increasingly been lost due mainly to human land alteration.¹²

Because wetlands affect the health of the nation’s waters, the Clean Water Act (CWA)¹³ governs¹⁴ human activities that impact wetlands,¹⁵ with some exceptions.¹⁶ Section 404 of the Act requires persons who wish to conduct certain activities, such as dredging and filling in advance of construction in wetlands, to apply for a permit from the U.S. Army Corps of Engineers (the Corps).¹⁷ The Corps may require, as a mandatory and enforceable condition of the §404 permit, that the permittee undertake “compensatory mitigation” efforts to offset the effects of the permitted activity on the wet-

land at issue.¹⁸ Compensatory mitigation refers to the restoration, enhancement, or creation of a wetland.¹⁹

However, the use of compensatory mitigation has not always resulted in self-sustaining, healthy wetland systems. Although the rate of wetland loss in the United States had slowed by 80% between 1987 and 1997, tens of thousands of acres of wetlands are still lost each year, according to agencies overseeing wetland programs.²⁰

In 2001, the continuing loss of U.S. wetlands led the National Research Council (NRC) to investigate and publish its landmark report, *Compensating for Wetland Losses Under the Clean Water Act* (the NRC Report), which synthesized over a decade of ecological studies of mitigation sites, and recent work by other scientific and legal scholars.²¹ The following year, EPA, the U.S. Fish and Wildlife Service (FWS), and the Corps acknowledged that we had not achieved the goal of “no net loss.”²² President George W.

9. NRC ECOLOGICAL INDICATORS, *supra* note 1. “Global emissions of carbon from fossil fuel combustion increased by 1.1% in 2001, reaching a new high of 6.55 billion tons . . . [.] Annual carbon emissions have now more than quadrupled since 1950.” Worldwatch Inst., *Cooperation With the United Nations Environment Programme*, in VITAL SIGNS 2002: THE TRENDS THAT ARE SHAPING OUR FUTURE 52 (Worldwatch Inst. 2002) (citations omitted); see also MITSCH & GOSSELINK, WETLANDS, *supra* note 7, at 590.

10. MITSCH & GOSSELINK, WETLANDS, *supra* note 7, at 571-609.

11. *Id.* at 588.

12. The U.S. Fish and Wildlife Service (FWS) estimates that by 1980, one-half of the 220 million acres of wetlands in the United States were destroyed through draining and land clearing for agriculture and other purposes. T.E. DAHL, U.S. DEP’T OF THE INTERIOR, WETLAND LOSSES IN THE UNITED STATES 1780s TO 1980s (1990), available at <http://www.fws.gov/birds/waterbirds/umvgl/LitCiteWeb.doc> (last visited Jan. 8, 2007). See also Office of Wetlands & Watersheds, U.S. EPA, *Wetlands Status and Trends*, <http://www.epa.gov/OWOW/wetlands/vital/status.html> (last visited Nov. 20, 2006) [hereinafter U.S. EPA, *Status and Trends*].

13. 33 U.S.C. §§1251-1387, ELR STAT. FWPCA §§101-607. Note first, there is no one wetland law in the United States, and second, wetlands are legally affected by a universe of perhaps 30 statutes, executive orders, or policy and technical guidances. See MITSCH & GOSSELINK, WETLANDS, *supra* note 7, at 641. For a helpful overview, see MARGARET N. STRAND, WETLANDS DESKBOOK (Env’tl. L. Inst. 2d ed. 1997).

14. The nation is undergoing the loss of wetlands outside of the CWA’s §404 permit program. Although important to the integrity of our watersheds, these losses are not the subject of this Article. Within the universe of permit-covered wetlands, we should be all the more exacting in executing the letter and spirit of the CWA. The contributive causes and issues surrounding losses of non-§404 (nonjurisdictional) wetlands include the complex dynamics and chilling effect of takings, as well as recent developments involving so-called isolated wetlands and their case lineage after *Solid Waste Agency of N. Cook County v. Corps of Eng’rs*, 531 U.S. 159, 31 ELR 20382 (2001), as well as other matters.

15. For regulatory purposes under the CWA, the term “wetland” means “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.” 40 C.F.R. §230.3(t) (July 7, 2001). For common names of wetlands, see MITSCH & GOSSELINK, WETLANDS, *supra* note 7, at 641. For a history of wetland classification systems, see *id.* at 725-58.

16. 33 C.F.R. §323.4 (2001). Exemptions include “those associated with normal farming, silviculture, and ranching activities.”

17. 33 U.S.C. §1344(e); Final Notice: Issuance of Nationwide Permits, 67 Fed. Reg. 2020 (Jan. 15, 2002). Regulations governing the §404 permit program are located at 33 C.F.R. ch. II, pt. 323-31 (2001).

18. The permittee may pay a third party to perform the mitigation requirement or may participate in an economic trade type of arrangement by working through a mitigation bank. See NRC COMPENSATING FOR LOSSES, *supra* note 4, at 15.

19. 67 Fed. Reg. at 2094. Preservation means the protection of a separate, off-site wetland through purchase, conservation easement, or another preservation method, often to augment the success of an adjacent creation or enhancement project. NRC COMPENSATING FOR LOSSES, *supra* note 4, at 13-14. Although “preservation” is also an aspect of mitigation, preservation is favored as a last, and not a first, option. Ironically, this is despite the fact that the word “preservation” appears countless times in the statute and regulations surrounding wetland mitigation. Preservation of an existing natural wetland while laudable, is arguably the least preferred option because such preservation does not contribute as much to “no net loss” as restoration or creation, as if the landowner were to say, “allow me to fill this wetland, and I promise to leave another wetland alone.” Note also the lurking policy sense that since the Corps has an express, underlying legal obligation of preservation (via the National Environmental Policy Act’s (NEPA’s) preference for avoidance of impact) the Corps should therefore not encourage a landowner to resort to preservation as a bargaining chip for gain. For detailed discussion of mitigation in the context of mitigation banking, see MARK S. DENNISON & JAMES A. SCHMID, WETLAND MITIGATION: MITIGATION BANKING AND OTHER STRATEGIES FOR DEVELOPMENT AND COMPLIANCE (Government Institutes 1997).

20. U.S. EPA, *Status and Trends*, *supra* note 12.

21. The National Academy of Sciences’ 2001 report on the status of wetland mitigation was comprehensive. The 2001 report synthesized scientific evaluations of wetland mitigation from the past decade and presented the committee’s own observations based upon its study of mitigation sites and evaluation data. While this Article does not rely exclusively on the 2001 report, it is key for several reasons. The 2001 report is an independent review, conducted by the Committee on Mitigating Wetland Losses. This committee’s membership represents a variety of expertise and background, including law, science, academia, state transportation, and federal agencies charged with wetland mitigation. The committee’s report was peer reviewed to make sure it met “institutional standards for objectivity, evidence, and responsiveness to the study charge.” The nine peer reviewers are as diverse and distinguished as the report’s authors and include representatives from industry and litigation defense counsel. The report is exerting an enormous impact on agencies regulating wetlands. NRC, COMPENSATING FOR WETLAND LOSSES UNDER THE CLEAN WATER ACT (2001).

22. *Id.* EPA estimates that wetland losses on nonfederal lands continue at a rate between 70,000 and 90,000 acres annually. The FWS estimates that “[a]lthough the Nation has not met the goal of no net loss of wetlands, substantial progress has been made in reducing the rate of loss,” from an average of 64,400 acres per year (1986 to 1997) to 58,500 acres per year, the level the FWS reported to the U.S. Congress in its third decadal report, a report that is required by the Emergency Wetlands Resources Act of 1986, 16 U.S.C. §3901. The Natural Resources Conservation Service of the U.S. Department of Agriculture reported in the December 2000 revision of its 1997 *National Resources Inventory: Highlights*, that on nonfederal land (75% of the land in the United States) in the lower 48 states, an annual aver-

Bush subsequently affirmed his Administration's commitment to the prior concept of no net loss through a new National Wetlands Mitigation Action Plan.²³

In March 2006, EPA and the Corps jointly announced an open public comment period in advance of formal rulemaking.²⁴ The proposed rule would effect important changes to several key regulations governing mitigation of losses of stream and wetland aquatic systems. Although the new rule covers streams as well as wetlands, this Article will outline the purposes and highlights of the March 2006 notice with regard to wetlands alone.

Part II of this Article will provide background about wetlands and explain why compensatory wetland loss mitigation is necessary. Part III will describe wetland compensatory mitigation and where it fits within the law, and will present the basics of the March 2006 advanced notice of proposed rulemaking and what EPA and the Corps seek to accomplish through the new rule's formal adoption. Part IV will offer a synopsis of the agencies' activities in response to the 2001 NRC Report's recommendations. The conclusion will offer some observations regarding the long-term future of wetlands, mitigation loss, and what it might take to achieve a net gain of important wetland functions across U.S. watersheds.

II. Wetland Loss and Why It Matters

At the time of European contact with North America, the area that is now the United States had abundant wetlands throughout every region, perhaps most famously in the Mississippi River Delta.²⁵ Yet, by the mid-1980s, approxi-

age of 101,000 acres of wetlands was lost from 1992 to 1997, "with almost 69,000 acres gained, for an overall average annual net loss of 32,600 acres per year," with development causing 49% of the total loss, agriculture causing 26% of the loss, silviculture causing 12% of the loss, and miscellaneous reasons causing 13% of the loss. 1997 NATIONAL RESOURCES INVENTORY: HIGHLIGHTS (rev. ed. 2000), available at http://www.nrcs.usda.gov/technical/NRI/1997/national_results.html [hereinafter 1997 National Resources Inventory Highlights]. The Corps' 1990s requirement of 178 acres of mitigated wetland for every 100 acres of impacted wetland achieves no net loss on paper. However, the lack of data on how many permit-required mitigation projects were initiated, completed, or achieved ecosystem sustainability makes it impossible to judge. NRC COMPENSATING FOR LOSSES, *supra* note 4, at 19-20, 117-22. Note that in January 2002, the Corps stated that "[t]he Corps agrees with the NRC/NAS report that we must improve the success of mitigation." 67 Fed. Reg. at 2068.

23. *National Wetlands Mitigation Action Plan* (Dec. 24, 2002), <http://www.mitigationactionplan.gov> (last visited Nov. 20, 2006).
24. Notice of Proposed Regulations: Compensatory Mitigation for Losses of Aquatic Resources, 71 Fed. Reg. 15519 (Mar. 28, 2006), available at <http://www.epa.gov/wetlandsmitigation>.
25. Historically, there were intact riverine wetland systems throughout North America in the 1600s, which, if still in existence, would provide the full range of wetland services and functions. See ANN VILEISIS, *DISCOVERING THE UNKNOWN LANDSCAPE: A HISTORY OF AMERICA'S WETLANDS* (Island Press 1997). A massive coastal wetland restoration is underway in the state of Louisiana, which is suffering catastrophic losses of its historic coastline and coastal estuary systems due to erosion that is the result of two centuries of land alteration and wetland draining, followed by catastrophic Hurricane Katrina in September 2005. For details about the history of the restoration project and a prescient 2004 prediction of Hurricane Katrina's damage, see Joel K. Bourne Jr., *Gone With the Water*, NAT'L GEOGRAPHIC, Oct. 2004, available at <http://magma.nationalgeographic.com/ngm/0410/feature5> (last visited Dec. 15, 2006). There is a comprehensive report by 18 experts including Prof. Oliver Houck, entitled *After the Storm: Restoring America's Gulf Coast Wetlands*, A

mately 42 million hectares (ha),²⁶ or 103.3 million acres²⁷ of wetlands remained in the lower 48 states, primarily occurring on private lands, according to the FWS.²⁸ For purposes of scale, the FWS estimates that 75% of the nation's total land area is nonfederal.²⁹ Remaining wetlands that occur on private lands therefore represent a quantity and source of wetland functions and values that are nationally significant.³⁰ In this regard, note that although wetland loss has slowed somewhat, the pace of development has accelerated dramatically. While the pace of development indicates that pressure on remaining wetlands will continue, calling for ever-greater numbers of fill permits under the CWA, the need to consider associated uplands, forest, and riparian areas contributing to wetlands functions and services is also implied.³¹

EPA's list of major causes of wetland loss and degradation includes both human and natural threats.³² Although agri-

Special Report of the National Wetlands Newsletter (Env'tl. L. Inst. 2006), available (for purchase) at www.eli.org/store.

26. MITSCH & GOSSELINK, *WETLANDS*, *supra* note 7, at 71. The authors estimate that 47.300 million ha of wetlands were lost. *Id.* at 657.
27. EPA estimates that wetlands on nonfederal lands continue to be lost at a rate of 70,000 to 90,000 acres per year. A calculation using EPA's more conservative figure of 70,000 acres lost per year through 2004 results in an estimate of 101.9 million acres remaining. The FWS, on the other hand, estimates that 58,500 acres of wetlands are currently lost per year, with the latest figure being 105.5 million acres remaining in 1997. To bring that figure current to 2004, using the 58,500-acre FWS annual loss estimate figure, results in a calculation of 105 million acres existing. Thus, it is reasonable to assume in 2004 that the lower 48 states contained between 101.9 and 105 million acres of wetlands. U.S. EPA, *Status and Trends*, *supra* note 12.
28. Summary Findings From the Third Report to Congress on Status and Trend Studies of the Nation's Wetlands, <http://www.fws.gov/nwi/statusandtrends.htm> (last visited Dec. 17, 2006) [hereinafter 1997 Summary Findings].
29. 1997 National Resources Inventory Highlights, *supra* note 22.
30. Because they are largely capable of being "jurisdictional" wetlands, within the legal definition of "waters of the United States," the federal and state governments regulate activities on many if not most wetlands on private lands. Despite the historical damage and loss of these wetlands throughout the past three decades, the Corps has not made major updates to the §404 program. CWA, 33 C.F.R. ch. II, §328.2.
31. The NRCS states that from 1992 to 1997, the pace of development in the United States was 2.2 million acres per year, more than 1.5 times the rate of the previous decade.
32. Human actions threatening wetland values include drainage, dredging and stream channelization, deposition of fill material, diking and damming, tilling for crop production, levees, logging, mining, construction, runoff, air and water pollutants, changing nutrient levels, releasing toxic chemicals, introducing non-native species, and grazing by domestic animals. "Natural" threats (and phenomena sometimes accelerated by human actions) include erosion, subsidence, sea level rise, droughts, and hurricanes and other storms. U.S. EPA, *Status and Trends*, *supra* note 12. Note that many of the foregoing "causes of wetland loss and degradation," including polluted runoff, can be inferred empirically to further contribute to "consequences of wetland loss and degradation." Wetlands trap, store, and purify surface runoff, which in turn removes sediment, chemical contamination, and excess nutrients from the runoff; wetlands remove air and water pollutants; wetlands aid in reducing erosion; the evapotranspiration provided by wetlands cools and humidifies air, which contributes to the hydrological cycle and could help produce rain, alleviate drought, and reduce air temperature. In addition, wetlands remove and store carbon dioxide from the atmosphere—all potentially counteracting effects of global warming. Empirically, the hydrological cycle is a feedback loop between the earth's surface and the atmosphere. Thus, for example, according to William Mitsch and James Gosselink:

Wetlands occur most extensively in regions where precipitation, a term that includes rainfall and snowfall, is in excess of losses such as evapotranspiration and surface runoff. Wet-

culture played a large role historically,³³ EPA states that the role of draining wetlands for agricultural purposes may be slowly diminishing, with other development taking a larger toll on wetlands.³⁴

From 1986 to 1997, the FWS gauges that human activities are the source of national wetland losses according to the following proportions: 30% to urban development; 26% to agriculture; 23% to silviculture; and 21% to rural development.³⁵

In assessing damage to wetlands by wetland type, the FWS states that forested wetlands suffered the greatest losses between 1986 and 1997, leaving the country with fewer than 50 million acres of forested wetlands for the first time in history.³⁶ The greatest cause of forestland loss in the United States between 1982 and 1997 was development.³⁷ The Natural Resources Conservation Service (NRCS) estimates that forestland accounts for 27% of nonfederal land, and nearly 59% of wetland acreage is on forestland, while 16.5% is on agricultural cropland.³⁸ While variable, forested wetlands contribute significantly to wetland functions and values.³⁹

Coastal wetlands are another major wetland category that is sustaining major loss. This loss has received national government and media attention in recent years. These wetlands include freshwater wetlands, saltwater marshes, and estuaries. EPA estimates that in Louisiana alone, 65 square kilometers per year (km²/year)—which is approximately 25.1 miles—of coastal wetlands are being lost.⁴⁰ To date, the West Coast has lost 68% of its wetlands.⁴¹ Not surprisingly, excess nutrients, sediments, and anthropogenic pollutants

are damaging coastal waters. Contributors to the problem include impaired upland watersheds, which drain to the oceans. Many plankton are born in coastal wetlands and estuaries before dispersing to coastal waters. Scientists estimate that waters within 200 miles of the coast contain 80-90% of commercially valuable fish species.⁴² Therefore, impairment and loss of coastal wetland and estuary systems is an important and costly component of national wetland loss.⁴³

As the FWS data above suggest, urban and rural development are responsible for roughly one-half of wetlands destruction. Development includes roads, retail complexes, parking lots, and subdivisions. As humans convert intact habitats to various uses, or fragment and isolate habitats into smaller acreages, biodiversity declines. While not limited to wetlands, a recent study by four scientists states: “Land transformation is the single most important cause of extinction, and current rates of land transformation eventually will drive many more species to extinction,⁴⁴ although with a time lag that masks the true dimensions of the crisis.”⁴⁵

To date, research suggests that when 10% of a watershed’s acreage has been covered with roads, parking lots, rooftops, and other surfaces that are impervious to water, the rivers and streams within those watersheds become “seriously degraded.”⁴⁶ Moreover, the 2002 Heinz Center report, *The State of the Nation’s Ecosystems*, states that

perhaps the single most dramatic and pervasive impact of urbanization on the functions and values of a water-

land-rich regions such as the eastern provinces of Canada have 50 to 60 cm/yr. of excess precipitation (precipitation less evaporative losses), whereas regions of the southwestern United States have precipitation deficits of 100 cm or more and generally few wetlands.

See MITSCH & GOSSELINK, *WETLANDS*, *supra* note 7, at 123-26.

33. Agriculture has an enormous impact on wetlands through direct filling, runoff of nitrogen and phosphorus from manure and fertilizers, and soil (causing siltation or turbidity in streams and other waters). As of 1998, agriculture was the leading cause of wetland destruction, according to EPA. U.S. EPA, NATIONAL WATER QUALITY INVENTORY: 1998 REPORT TO CONGRESS 61-62, 65, 87-88, 91, 147, 149-50, 164 (2000).
34. U.S. EPA, *Status and Trends*, *supra* note 12.
35. 1997 Summary Findings, *supra* note 28.
36. *Id.*
37. “Over the 15-year period, 1982-97, the total acreage of developed land increased by more than twenty-five million acres, or one-third (34%). . . . Non-Federal forest land is the dominant land type being developed.” Forestland and cultivated crop land account for more than 60% of total acres developed since 1982; 30% of that is “converted prime farmland.” 1997 National Resources Inventory Highlights, *supra* note 22.
38. 1997 National Resources Inventory Highlights, *supra* note 22. Recall that the §404 program contains a permit exemption for “normal silviculture practices.”
39. See MITSCH & GOSSELINK, *WETLANDS*, *supra* note 7, at 735-36, for an example of the difficulty of assessing the human value of forested wetlands.
40. THE COASTAL RESEARCH & MONITORING STRATEGY WORKGROUP CLEAN WATER ACTION PLAN: COASTAL RESEARCH AND MONITORING STRATEGY (2000), available at <http://water.usgs.gov/owq/cleanwater/pubs.html>.
41. *Id.* at 33. “Currently, surveys are conducted only to estimate the amount of acreage of wetlands every ten years. No surveys examine, at a national level, the ecological condition of these critical coastal habitats.”

42. For example, of the \$111 billion fishing industry (including recreational and commercial) in 1997, 71% (or \$79 billion) is generated by wetland-dependent species according to Pacific Coast Federation of Fishermen’s Associations. See <http://www.pcffa.org> (last visited Nov. 27, 2006).

43.

Many marine organisms, including most commercially valuable fish species, depend on near-shore waters at some point during their development. Near-shore waters provide habitat for 80% of the fish species in the United States. . . . The modification of surrounding lands causes water quality problems that can decrease the number of species capable of living and reproducing in the near-shore waters.

U.S. EPA, *Coastal Watersheds Factsheets*, <http://www.epa.gov/owow/oceans/factsheets/fact3.html> (last visited Nov. 27, 2006).

44. “At present, 11% of the remaining birds, 18% of the mammals, 5% of fish, and 8% of plant species on Earth are threatened with extinction.” Peter M. Vitousek et al., *Human Domination of Earth’s Ecosystems*, 277 SCIENCE 494 (1997) (citing R. Barbault & S. Sastrapradja, in UNITED NATIONS ENVIRONMENT PROGRAMME, GLOBAL BIODIVERSITY ASSESSMENT 193-274 (V.H. Heywood ed., Cambridge Univ. Press 1995)); see also *supra* note 5.
45. Vitousek et al., *supra* note 44 (citing D. Tilman et al., *Habitat Destruction and the Extinction Debt*, 371 NATURE 65 (1994)):

Even moderate habitat destruction is predicted to cause time-delayed but deterministic extinction of the dominant competitor in remnant patches. Further species are predicted to become extinct, in order from the best to the poorest competitors, as habitat destruction increases. Moreover, the more fragmented a habitat already is, the greater is the number of extinctions caused by added destruction.

46. Thomas R. Schueler, *The Importance of Imperviousness, in THE PRACTICE OF WATERSHED PROTECTION*, (Thomas R. Schueler & Heather K. Holland eds., The Center for Watershed Protection, 2002). This article originally appeared in the journal *Watershed Protection Techniques*. See Thomas R. Schueler, *The Importance of Imperviousness*, 1 WATERSHED PROTECTION TECHS. 100-11 (1994). For updates on the study of imperviousness with regard to biodiversity, water quality, and other issues, see also <http://www.biodiversitypartners.org/habconser/sprawl/01d.shtml>.

shed is the replacement of the natural landscape with pavement and other water-impervious (impenetrable) material such as roads, parking lots, driveways, sidewalks, and rooftops. Increased levels of impervious surfaces interrupt the hydrologic cycle, alter stream structure, and degrade the chemical profile of the water that flows through streams.⁴⁷

Filling wetlands interrupts natural hydrologic patterns within watersheds. Not all filled wetlands are transformed into impervious surfaces, and in many cases the uplands surrounding the wetlands may be even more at risk for being built on or paved. From the FWS data above, it is plausible that about half of wetlands and/or their adjacent uplands are replaced by concrete, asphalt, and other impervious surfaces. As stated, wetland losses to agriculture (fills achieved with dirt, a water-permeable surface) have decreased, while wetland losses attributable to urban and suburban development have increased. Much of this development converted lands rich in species, the values of filtration and water storage, and other services to acreage that is poor in species and that generates atmospheric heat and polluted runoff. Thus, recent data on wetland losses coupled with emerging studies of the 10%-rule phenomenon have urgent implications ideally considered at the watershed level⁴⁸ both before and during the permit application process and when determining specific permit conditions.

According to a recent report by the Pew Oceans Commission,

[t]he ten-percent rule applies to aquatic life, which is the ultimate measure of ecosystem health. Some of the earliest research on watershed coverage focused on aquatic insects. This work concluded that the diversity of macro invertebrates like stoneflies, mayflies and caddis flies falls sharply when imperviousness exceeds ten percent. These organisms represent the base of the food chain on which fish and other wildlife depend. Later studies derived similar results. . . . Particularly affected groups include trout, salmon, and other species of anadromous fish.⁴⁹

Insect inventories are almost never requested or completed when wetlands about to be impacted through a §404 permit are studied for functional assessment⁵⁰; moreover,

47. THE H. JOHN HEINZ III CENTER FOR SCIENCE, ECONOMICS & THE ENVIRONMENT, *THE STATE OF THE NATION'S ECOSYSTEMS: MEASURING THE LANDS, WATERS, AND LIVING RESOURCES OF THE UNITED STATES* 266-67 (The Heinz Center 2002).
48. Because of their implications for watersheds generally, the early results from studies of the 10%-rule phenomenon add a much larger dimension to our consideration of the consequences of wetland loss and the need to mitigate lost values, well beyond those of water quality function. If the 10%-rule phenomenon is confirmed upon further study, land use planners, in collaboration with state and federal governments, will need to factor in the rule's profound implications in order to protect watersheds and their biodiversity from unchecked growth or "sprawl." Officials and communities could implement mechanisms including zoning and urban growth boundaries in response to areas of greatest concern.
49. D. BEACH, *COASTAL SPRAWL: THE EFFECTS OF URBAN DESIGN ON AQUATIC ECOSYSTEMS IN THE UNITED STATES* 10 (Pew Oceans Comm'n 2002).
50. Insects are perhaps underexamined because of the assumption (contained, among other places, in the NRC Report) that "[b]irds and flying insects are exceptional in that a disrupted terrestrial landscape can be negotiated without complication, permitting movement to another wetland when necessary." NRC *COMPENSATING FOR LOSSES*, *supra* note 4, at 51. Perhaps even basic insect inventories could help in establishing compensatory, sustainable wetlands. Studies of insects' habitat needs could be considered as are the habitat and dispersal needs of nonflying invertebrates, reptiles, amphibians, and

original wetlands are seldom studied in advance of permitted impacts, due to time pressures of the project, Corps' staff and budgetary pressures, and higher priorities.⁵¹

III. The Evolution of Compensatory Mitigation

In the early 1990s, President George H.W. Bush adopted a national policy of "no net loss"⁵² of the nation's wetlands.⁵³ The no-net-loss measure was to be a temporary goal toward achieving net gain of wetlands.⁵⁴

Donald Hey and Nancy Philippi point out that the policy of no net loss has a deep connection to mitigation, which was supposed to provide the basis or mechanism for loss prevention. They state "[w]ithout such mitigation most wetland conservationists assumed [by the end of the 1980s] it would be impossible to achieve either the [Conservation Foundation's National Wetlands] forum's interim or long-term goals, because permits were being issued regularly to allow the destruction of existing wetlands."⁵⁵

small mammals that feed on insects. Such study could yield vital new data on the 10%-rule that could contribute richly to planning for siting and connectivity requirements, subsequently informing the planning and design phase of a successful mitigation, and helping to establish baseline determinations for monitoring and evaluation.

51. *Id.* at 3.
52. The concept of no net loss of wetlands existed earlier; the 1981 Mitigation Policy of the FWS contains references to the concept. In fact, the 1981 policy is still in use to advise other agencies, including the Corps, on questions involving impacts to fish and wildlife habitat. FWS Mitigation Policy, 46 Fed. Reg. 7656-63 (Jan. 23, 1981), *available at* http://www.fws.gov/policy/npi89_02.html (last visited Dec. 17, 2006). There are four resource categories under this policy: Resource Category 1 (unique and irreplaceable habitat) should be managed to achieve "no loss of existing habitat value." Resource Category 2 (of high value and "relatively scarce or becoming scarce on a national basis or in the ecoregion") should be managed to achieve "no net loss of in-kind habitat value." Resource Category 3 is of high to medium value and is relatively abundant, should be managed to achieve "no net loss of habitat value while minimizing loss of in-kind habitat value." And Resource Category 4, of medium to low value, should be managed to "minimize loss of habitat value" all with regard to "evaluation species." According to Larry R. Shanks and Robert J. Misso of the FWS, in a paper presented in October 1986: "In general, most wetlands would be placed in Resource Category 2, with a few high value irreplaceable wetlands being placed in Resource Category 1. Other habitat types usually placed in Resource Categories 1 and 2 include certain aquatic habitats such as natural springs, vegetated shallows, stream riffle areas, etc." Larry R. Shanks & Robert J. Misso, *Mitigation Policy of the U.S. Fish and Wildlife Service—in Perspective*, Association of State Wetland Managers, Inc., Proceedings: National Wetland Symposium, Mitigation of Impacts and Losses: Impact Reduction, Restoration and Creation, Oct. 8-10, 1986 (New Orleans, La.).
53. President George H.W. Bush adopted the phrase from a 1987 National Wetlands Policy Forum convened by Lee Thomas, then-EPA Administrator, and the Conservation Foundation. This forum was made up of 20 individuals from a wide spectrum of interests. Gov. Thomas Kean (R.-N.J.) chaired the group. Their report was published in the fall of 1988, as *PROTECTING AMERICA'S WETLANDS: AN ACTION AGENDA, THE FINAL REPORT OF THE NATIONAL WETLANDS POLICY FORUM* (Conservation Foundation 1988) [hereinafter *PROTECTING AMERICA'S WETLANDS*]; *see also* VILEISIS, *supra* note 25, at 317-18.
54. *PROTECTING AMERICA'S WETLANDS*, *supra* note 53.
55. DONALD L. HEY & NANCY S. PHILIPPI, *A CASE FOR WETLAND RESTORATION* 49 (John Wiley & Sons, Inc. 1999). However, the NRC Report takes pains to point out that the goal of no net loss is a policy statement and an interpretive rule from the 1990 Memorandum of Understanding that is neither part of the Corps nor EPA's regulations. While the Corps has the goal in the Water Resources Development Act of 1990, the "statutory goal does not specifically apply to the Corps's regulatory program. . . . [T]he program is not expected to achieve the goal of no net loss of existing wetland functions

EPA and the Corps have made clear that no net loss refers to no net loss of values and functions within the context of explicit recognition by the agencies of the special significance of the nation's wetlands.⁵⁶ To date, however, success has been judged by the more easily quantified measure of acreage rather than the more effective qualitative function. According to the FWS and the National Academy of Sciences' Committee on Mitigating Wetland Losses, the role of wetland mitigation is to provide substitute functions that the impacted wetland would have provided to the watershed.⁵⁷ A natural reading indicates mitigating the full complement of lost wetland functions; however, the statement does not state whether the objective is to replace some or all functions. In 2003, President George W. Bush affirmed his Administration's continuing commitment to no net loss of America's wetlands.⁵⁸

A. Compensatory Mitigation and Where It Fits Within the Law

The word "mitigation" has numerous meanings, both vernacular⁵⁹ and legal.⁶⁰ In essence, to mitigate something

and values by itself." NRC COMPENSATING FOR LOSSES, *supra* note 4, at 71.

56. However, the 1990 Memorandum of Agreement (MOA) Between the Department of the Army and the Environmental Protection Agency Concerning the Determination of Mitigation Under the Clean Water Act Section 404(b)(1) Guidelines, <http://www.epa.gov/owow/wetlands/regs/mitigate.html> (last visited Dec. 17, 2006) [hereinafter 1990 MOA] also recognizes that in instances where mitigation measures are not practicable or feasible, every permit to fill a wetland may not achieve compensation of functions and values. *Id.* §II(B). Recall that such memoranda are not afforded public notice and comment inherent in the making of binding rules, are advisory only, and do not have the force or effect of law. NRC COMPENSATING FOR LOSSES, *supra* note 4.
57. Primarily, mitigation takes place within the same watershed, but is not limited as such and may occur elsewhere if there are regional environmental reasons to do so. Because the target is a self-sustaining wetland that is highly functional, the Committee on Mitigating Wetland Losses believes that watershed planning needs to occur on a regional-watershed or landscape basis. NRC COMPENSATING FOR LOSSES, *supra* note 4, at 4, 145.
58. U.S. EPA, *News Release—EPA and Army Corps Issue Wetlands Decision* (Dec. 16, 2003), available at <http://www.epa.gov/owow/wetlands/guidance/SWANCC/index.html>.
59. The root of this word is *mitigare*, from Middle English stemming from Latin, from *mitis*, meaning mild or gentle. The first definition of mitigation is: "The action of mitigating something; the fact or condition of being mitigated." Mitigate is defined as:
1. Make milder in manner or attitude, make less hostile; mollify. Now rare.
 2. Give relief from (pain, suffering, etc.); lessen the suffering or trouble caused by (an evil or difficulty of any kind).
 3. Make (anger, hatred, etc.) less fierce or violent.
 4. a. Lessen the rigour or severity of (a law), make less oppressive; reduce the severity of (a punishment); make (a custom) more humane; b. Lessen the gravity of (an offence); palliate, extenuate.
 5. Moderate (the severity, rigour, etc., of something). Also make (heat, cold, light, etc.) more bearable.
 6. Become mitigated; grow milder or less severe.

THE NEW SHORTER OXFORD ENGLISH DICTIONARY 1797 (1993).

60. The legal definition of mitigation has two main, distinct connotations. One definition regards the "alleviation, reduction, abatement or diminution of a penalty." The other definition is the descendant of the doctrine of avoidable consequences, which "imposes on [the] injured party duty to exercise reasonable diligence and ordinary care in attempting to minimize his damages after injury has been inflicted" under the standard of the reasonable person, in like circumstances. Note that the first definition contemplates the bestowal of a form of partial forbearance or reprieve to a perpetrator or wrongdoer from

means to make it less harsh. The concept is consistent with equitable theories of restitution. The most meaningful root concept to bear in mind is that one person's action removed something valuable that belonged to another or to the commons.⁶¹ Equity dictates that an affirmative act must be performed to make up for the loss: an action that may include provision of substitute *res* as close to the thing taken as possible. Specifically, the objective is to make up for natural resource damage caused by human use, development, or other interference with the natural systems that benefit and sustain all.⁶²

Some observers consider the CWA to be the "single most important tool" for wetland protection.⁶³ Yet mitigation is not mentioned in the earliest text of the Act in 1972.⁶⁴ Mitigation became part of the §404 permit program by means of a 1990 memorandum of agreement (MOA) between EPA and the Corps.⁶⁵ Nonetheless, mitigation occupies a prominent place in 20th-century environmental law; the concept is contained in the Fish and Wildlife Coordination Act of 1934⁶⁶ and its 1958 amendments, and, most familiarly, in the regulations for administration of the National Environmental Policy Act (NEPA) of 1969.⁶⁷

NEPA is relevant because its procedures govern federal actions that affect the environment, including the Corps' permits to dredge or fill in wetlands. NEPA's procedural requirements mandate that before a federal agency commits an action that substantially affects the environment, it must consider alternatives, including no action, impact minimization, and impact mitigation. The Corps must simultaneously satisfy both the statutory and regulatory requirements of NEPA and the CWA and its regulations during the

requirements of a law. The second definition quite differently regards the responsibility of a victim to minimize his or her own injuries. However, wetland loss mitigation is the reduction of consequences *by a third party* on behalf of the public, and as such is neither a responsibility nor a benefit imposed on the perpetrator or the victim. However, the permit holder could plausibly consider the conditions requiring him to perform mitigation as an onerous penalty for wetland destruction. Definitions are from BLACK'S LAW DICTIONARY 903, 904 (5th ed. 1988).

61. The concept most likely has theoretical roots in trust (here, think of the public trust interest in water), tort (negligent injury to a person, place, or thing), contract (consider the permit and its conditions as a contract with the public), and criminal law (restitution to a victim).
62. The mitigation is owed to the general public whose interest in water was affected by the impact.
63. HEY & PHILIPPI, *supra* note 55. Donald Hey and Nancy Philippi also state that in the decade after §404 was passed, wetland losses went from 458,000 acres to 290,000 acres, or a reduction in loss of 37%.
64. Importantly, however, the NRC notes that "[i]n their first iteration the guidelines stressed the need to avoid wetland impacts" (citing 40 Fed. Reg. 41292 (Sept. 5, 1975)) (§404(b)(1) guidelines). NRC COMPENSATING FOR LOSSES, *supra* note 4, at 65.
65. The current guidelines, dating from 1980, underscore avoidance and detail activities to minimize the impact. "Included in the minimization discussion is a reference to compensatory mitigation: 'Habitat development and restoration techniques can be used to minimize adverse impacts and to compensate for destroyed habitat.'" *Id.*; see 1990 MOA, *supra* note 56.
66. Mitigation's place in the 1934 Act was largely procedural, according to NRC COMPENSATING FOR LOSSES, *supra* note 4, at 61. Of course, this is also true of mitigation within NEPA.
67. NEPA applies to all agencies of the federal government through §1500 of its regulations; 42 U.S.C.A. §§4321-4370e and regulations at 40 C.F.R. §§1500-1508 (West, 2001). See HEY & PHILIPPI, *supra* note 55; see also 32 C.F.R. §1508.20 ch. V, 651, app. F, F-1 Mitigation, ¶ (a) which references the 1978 CEQ regulations for implementing NEPA, including the avoidance hierarchy.

permitting process.⁶⁸ Particularly in regard to the statute's procedural requirements to avoid or minimize impacts, NEPA joins the §404(b)(1) guidelines as fundamental sources of law during the Corps' CWA §404 program permitting process. Still other regulations⁶⁹ apply to the permitting process besides the guidelines. In fact, a note leading into 40 C.F.R. §230.10 states just that.⁷⁰

1. Applicable Definitions of Mitigation

The National Association of Wetland Scientists, EPA, the FWS,⁷¹ and the NRC's Committee on Mitigating Wetland Losses⁷² have devised their own individual working definitions and policy statements concerning wetland mitigation, for application within the sphere of the CWA §404 permit program.

The most important definition for our purposes is that used by the Corps, appearing in the 1990 MOA between EPA and the Corps.⁷³ However, the 1990 MOA itself credits the definition to the regulations of the Council on Environmental Quality.⁷⁴

Compensatory Mitigation: For purposes of Section 10/404,⁷⁵ compensatory mitigation is the restoration, creation, enhancement, or in exceptional circumstances, preservation of wetlands and/or other aquatic resources for the purpose of compensating for unavoid-

68. In fact, the Corps' regulations state that "for actions subject to NEPA, where the Corps of Engineers is the permitting agency, the analysis of alternatives required for NEPA environmental documents, will in most cases provide the information for the evaluation of alternatives under these Guidelines." 40 C.F.R. §230.10(4) (July 1, 2001).

69. For example, the Corps is subject also to its own general regulations in 33 C.F.R. 320, its permitting regulations in 33 C.F.R. 323, 325, and 327, its NEPA regulations in 32 C.F.R. 651, and others.

70. The text states: "Note: Because other laws may apply to particular discharges and because the Corps of Engineers or State 404 agency may have additional procedural and substantive requirements, a discharge complying with the requirement of these Guidelines will not automatically receive a permit." 40 C.F.R. §230.10.

71. Mitigation with regard to dredge and fill activities is at least as old as the 1934 Fish and Wildlife Coordination Act, although therein the requirement was mainly procedural. NRC COMPENSATING FOR LOSSES, *supra* note 4, at 61.

72. The NRC defines mitigation as the "restoration, creation, enhancement, and in exceptional cases, preservation of other wetlands as compensation for impacts to natural wetlands." The committee further breaks down the definition to include permittee mitigation, third-party mitigation (usually commercial), in-lieu fee mitigation, cash donation or revolving fund program mitigation, noting that the greatest quantity of mitigation type is that carried out by the permit recipient. *Id.* at 2.

73. 1990 MOA, *supra* note 56.

74. The actual text from the 1990 MOA reads as follows:

II. POLICY: A. The Council on Environmental Quality (CEQ) has defined mitigation in its regulations at 40 C.F.R. 1508.20 to include: avoiding impacts, minimizing impacts, rectifying impacts, reducing impacts over time, and compensating for impacts. The Guidelines establish environmental criteria which must be met for activities to be permitted under §404. 2 The type of mitigation enumerated by CEQ is compatible with the requirements of the Guidelines; however, as a practical matter, they can be combined to form three general types: avoidance, minimization and compensatory mitigation. The remainder of this MOA will speak in terms of these general types of mitigation.

75. The "10" refers to §10 of the Rivers and Harbors Act of 1899, which contains the requirement of a permit for dredging and filling in navigable waters. 33 U.S.C. §403 (2001).

able adverse impacts which remain after all appropriate and practicable avoidance and minimization has [sic] been achieved.⁷⁶

In addition to the Corps,⁷⁷ a minimum of two federal agencies are involved in achieving the objectives of the CWA, and its §404 permit program, in particular EPA and the FWS, both of which serve an important review and advisory role by ensuring that permitted activities have taken account of impacts to wildlife resources.⁷⁸ In states that have a federally approved state permit program, state and even county agencies may be involved in the process of reviewing a proposal to fill a wetland.

For the Corps, the role of mitigation is to compensate "for unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved."⁷⁹ For the FWS, the role of mitigation is to "provide substitute functions that the impacted wetland would have provided to the watershed."⁸⁰

The "waters of the United States"⁸¹ comprise the regulatory subject matter of the CWA. Mitigation, well-executed,

76. 67 Fed. Reg. at 2020. The Corps' NEPA regulations state: "The intention of mitigation is to reduce the effects of the action on the environment." 32 C.F.R. ch. V, 651, app. F, F-1 Mitigation (b).

77. Historically, the Corps mainly oversaw dredging and filling in navigable waters under the Rivers and Harbors Act of 1899, long before the first iteration of the CWA in 1972. Therefore, while EPA is authorized to grant most types of permits to discharge pollutants under the CWA, the main responsibility for dredge and fill permits has remained with the Corps. The Corps administers the §404 program, but under EPA oversight. In exercising its oversight, EPA may overrule the Corps' granting of a permit under special circumstances. THEDA BRADDOCK FOWLER, WETLANDS REGULATION: CASE LAW, INTERPRETATION, AND COMMENTARY 33 (Government Institutes/ABS Consulting 2003).

78. NEPA requires the three federal agencies to evaluate, weigh, and determine factors comprising major federal actions impacting the environment, including §404 permits. 40 C.F.R. §1508.18(b)(4). The Corps' own regulations, in 33 C.F.R. §320.3(e) and §320.4(c), reiterate the Corps' mandatory obligation to also consult with the FWS before proposing to modify any body of water, including wetlands. Although the Fish and Wildlife Act obligates the FWS to advise agencies on habitat impacts, and to make compensatory mitigation recommendations, the agencies are not required to adopt the FWS' advice (*Sierra Club v. Alexander*, 484 F. Supp. 455 (D.C.N.Y. 1980)); in its written NEPA documentation justifying a major federal action such as granting a permit to fill, the Corps must consider mitigation when considering alternatives to the action proposed, but NEPA does not demand that the agencies require any mitigation, nor perform mitigation activities themselves; *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332 (1989).

79. 67 Fed. Reg. at 2094. The Corps' NEPA regulations state: "The intention of mitigation is to reduce the effects of the action on the environment." 32 C.F.R. ch. V, 651, app. F, F-1 Mitigation (b). The Corps' definition also conveniently incorporates the legally necessary NEPA hierarchy and the §404(b)(1) guidelines, relying on key terms such as "unavoidable," "adverse impacts," "practicable," and "minimization."

80. The subtle difference in meaning between these definitions is more than semantic—it underscores the distinctiveness of the two agencies' missions, scope of responsibility and disciplinary training. It also underscores the potential divergence or compatibility of evaluating mitigation results in terms of regulatory success (as opposed to ecological success).

81. The CWA's definitions as a whole are located in 33 U.S.C. §1362. The Act retained the Rivers and Harbors Act of 1899's focus upon navigability of "waters of the United States." This nexus between navigability and the waters of the United States enabled attachment of the Commerce Power under Art. II, §8(3), which became the basis of legitimacy of the federal government's authority to regulate nearly all waters, in order to fulfill the CWA's mandate of maintaining and restoring the chemical and biological integrity of "the Nation's waters." This constitutional "hook" has become a highly con-

fits neatly under the Act's twin goals of restoration and maintenance of the water resource. Wetlands fit into the CWA's broad statutory structure of water regulation because they are a subset of "waters of the United States" that include "all waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide." Wetlands, by definition,⁸² are "waters of the United States." The Act's §404(b)(1) guidelines define wetlands in the following way:

The term wetlands means 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.⁸³

The CWA, according to §101, was enacted to "restore and maintain the chemical, physical, and biological integrity of the nation's waters."⁸⁴ The standard of quality to be achieved is "wherever attainable . . . a goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water"⁸⁵

The CWA contains three main mechanisms to protect U.S. waters. These are prohibition against pollution, permit programs for limited discharges and fills, and systematic penalty provisions. The Act features technology-based standards and water quality standards that support the application of all three mechanisms. Therefore, the key CWA provisions for protecting water and wetlands are §§101, 301, 401, and especially 404. Other provisions, namely §§303, 309, and 505, are also helpful. Each provision will be discussed in numerical order.

To achieve the CWA's §101 goals, §301(a) prohibits the discharge of any pollutant in the waters of the United States, except by permit. This prohibition pertains to pollution from a discrete or "point" source.⁸⁶ For the purposes of the CWA, the definition of "pollutant" includes dirt, gravel, and other materials placed into the waters of the United States, including wetlands.⁸⁷ A point source is defined as any "discernible, confined, and discrete conveyance, pipe, ditch, channel . . ." but broadly includes a dump truck, backhoe, or bulldozer, as defined by §502(14) of the Act and case law.⁸⁸ Thus, the law protects wetlands as a subset of U.S. waters by prohibiting

the addition of pollutants (including dirt or gravel) without a government-issued permit. If a permit is issued, it may have conditions attached. Potential conditions include an outline of positive actions the permittee must undertake to mitigate the permitted impact.

The Act's §303 water quality standards are the benchmark for determining whether the nation's waters are meeting, failing, or exceeding basic threshold levels. This threshold, contained in §303(c)(2)(a), states that all waters must be of sufficient, basic condition that allow people to fish and swim in them. This deceptively simple standard at the heart of the CWA is mainly responsible for the Act's success; the goal is universal, nontechnical, and practical. The water quality goal is capable of application throughout the United States and across a spectrum of waters. The various states can apply to regulate their in-state waters via EPA-approved water quality certification programs, and most states have established such programs.

2. Regulatory Hook: Tying Water Quality Standards to Wetland Mitigation

Water quality standards are highly relevant to measuring the success of watershed health, and to planning for impacts to wetlands in the parent watershed. Because wetland soil organisms, chemical reactions, and plant processes work separately and synergistically to filter sediment and pollutants, these ecosystems improve water quality. If the Corps determines that a proposed wetland fill has significant water quality implications, both in state and affecting neighboring states, the relevant district engineer can request that the permit applicant obtain a water quality certification.⁸⁹ No permit will be granted until the certification has been received or waived.⁹⁰

Section 401 contains water quality certification authorities that are relevant to wetland permitting decisions. States with federally approved §401 water quality certification programs can implement a parallel permitting process whereby a permit applicant must simultaneously satisfy both the state's water quality standards and permit procedures and federal permit requirements.

Water quality certification decisionmaking promotes good wetland management by setting/including wetland water quality standards through three aspects. These aspects are assignments of designated uses, specific criteria to support those uses, and the application of a proactive anti-degradation policy.

As early as 1988, the National Wetlands Policy Forum recommended a more aggressive use of states' §401 certification programs with regard to protecting state wetlands "from chemical and other types of alterations." In 1989, EPA released a guidance document as a resource for states to use in employing their §401 certification programs for the protection of wetlands. The guidance provides the following rationale:

Water quality standards specifically tailored to wetlands provide a consistent basis for the development of policies and technical procedures for managing activities that impact wetlands. Such water quality standards provide the goals for Federal and State programs that regu-

tentious issue, which is important here because its resolution will have enormous impacts upon the quantity (and possibly the quality, by extension of some very real watershed issues) of "jurisdictional" wetlands. The future viability of the no net loss policy will be discussed further in the Conclusion.

82. See 33 C.F.R. ch. II, §328.2 (permit regulations of the Corps).

83. 40 C.F.R. §230.3(t) (July 1, 2001).

84. 33 U.S.C. §1251(a).

85. 33 U.S.C. §1251(a)(2). The Act states that the water quality goal was originally to be achieved by 1983.

86. Relevant permit provisions are located in §402.

87. The relevant statutory definitions here are "pollutant," in 33 U.S.C. §1362(6) and "discharge of a pollutant," in 33 U.S.C. §1362(12).

88. For example, see *United States v. Lambert*, 915 F. Supp. 797, 26 ELR 21116 (S.D. W. Va. 1996); and *Borden Ranch Partnership v. Corps of Eng'rs*, 261 F.3d 810, 32 ELR 20011 (9th Cir.), cert. granted, 122 S. Ct. 2355, 536 U.S. 903, *aff'd*, 123 S. Ct. 599, 537 U.S. 99 (2001).

89. Under 33 C.F.R. ch. II, §325.2(b).

90. *Id.* §325.2(b)(ii).

late discharges to wetlands, particularly those under CWA Sections 402 and 404 as well as other regulatory programs (e.g., Sections 307, 318, and 405) and non-regulatory programs (e.g., Sections 314, 319, and 320). In addition, standards play a critical role in the State [sic] 401 certification process by providing the basis for approving, conditioning or denying Federal permits and licenses, as appropriate. Finally, standards provide a benchmark against which to assess the many activities that impact wetlands.⁹¹

Section 404 of the CWA and its regulations are critical to wetland protection and wetland loss mitigation.⁹² Section 404 governs the dredging and filling in of wetlands (with exceptions),⁹³ in support of the Act's mission and goals of attaining and maintaining clean water.

The section 404(b)(1) guidelines require that a permitted activity not cause or contribute to significant degradation of the waters of the United States, either individually or cumulatively. When determining whether a proposed activity will result in significant degradation, the Corps will consider to what extent compensatory mitigation will offset the activity's adverse effects.⁹⁴

However, not all wetlands are covered by CWA jurisdiction.⁹⁵

Many states have wetland fill permit programs based on the federal program, and authorized by §404(g) of the CWA. State programs must be at least as protective of state waters as the §404 program is of the nation's waters. However, states may even elect to make their state permit programs more protective, as indicated in §404(h)(1)(A)(i).

The §404 program regulates wetland dredging or filling mainly via two types of permits, nationwide (general)⁹⁶ and individual (standard) permits.⁹⁷ Individual permits com-

prise 15% of all permits, while nationwide permits comprise 85% of permits. The Corps may require the permittee to undertake and complete sufficient mitigation activities under either the individual permit⁹⁸ or the nationwide permit⁹⁹ in order to offset the effects of the permitted activity on the wetland at issue. The Corps' mitigation steps become mandatory, legally enforceable conditions of the permit under §309 of the CWA. Section 309 contains civil¹⁰⁰ and criminal¹⁰¹ penalties for noncompliance with the law. To ensure enforcement, §505 allows citizens to sue any person alleged to be in violation of the Act, or the EPA Administrator if he/she fails to enforce the CWA and its associate regulations.¹⁰² Failure to enforce the law can include failure to enforce §404 permit conditions such as wetland mitigation through restoration, enhancement or creation.

Nationwide permits did not require mitigation until 1996.¹⁰³ The nationwide permit features a simpler, more streamlined process reserved for applicants who estimate

91. National Guidance: Water Quality Standards and Wetlands, <http://www.epa.gov/owow/wetlands/regs/quality.html> (visited Dec. 17, 2006).

92.

Central to developing a taxonomy is the definition of mitigation "action." A compensatory mitigation project consists of distinct actions, including a general design concept, identification of a general watershed location for the project, development of site design plans, development of ecological performance standards (target wetland functions), site acquisition, construction in accordance with design standards, monitoring to determine whether the design is trending toward the target wetland functions, achievement of performance standards, and regulatory certification that a site meets required mitigation requirements. Another distinct stage is an action to assure that the site is protected and managed in perpetuity. With each step, the actions taken increase the assurance that the compensatory wetlands will contribute to the ecological values of the watershed.

NRC COMPENSATING FOR LOSSES, *supra* note 4, at 83.

93. The permit program's many exemptions appear in §404(f), and they include "normal farming, silviculture, and ranching activities." The loss of wetlands due to agriculture is well known and somewhat ameliorated by the success of programs such as the Wetland Reserve Program of the NRCS of the U.S. Department of Agriculture.

94. NRC COMPENSATING FOR LOSSES, *supra* note 4, at 65.

95. In fact, one author asserts that §404 might be pertinent to only 20% of wetland destruction nationally. Robert E. Beck, *The Movement in the United States to Restoration and Creation of Wetlands*, 34 NAT. RESOURCES J. 781, 794 (1994). Wetlands not protected by the CWA are listed in Permits for Discharges of Dredged or Fill Material Into Waters of the United States, 33 C.F.R. ch. II, pt. 323.

96. The Corps estimates that it issues 40,000 nationwide permits per year. 67 Fed. Reg. at 2064.

97. The Corps' authority to issue or deny permits exists implicitly, "by virtue of the interplay between §§404(b)(1) and 403(c)," NRC COMPENSATING FOR LOSSES, *supra* note 4, at 64, and the authority exists explicitly by virtue of 33 C.F.R. ch. II, §325.8. The provision regarding enforcement is covered in §326. The Corps may modify, suspend, or revoke a permit under 33 C.F.R. ch. II, §325.7. The authority of the EPA Administrator to veto permits is located in 33 C.F.R. ch. II, §320.2(f). The following is a basic description of the §404 permit process:

1. applicant completes and submits Engineer Form 4345 to nearest District Office, which processes the application.
2. The District Office issues a notice to the public that citizens may submit comments on the application for thirty days.
3. The Corps, EPA, FWS, state and local government, organizations having a special interest, and individuals review the application and submit comments.
4. A public hearing may be held if the agencies determine the circumstances dictate there is sufficient public interest at stake in the application.
5. The Corps evaluates the application by making the factual determinations required by §230.11 of the §404 Guidelines, 40 C.F.R. ch. 1, pt. 230.
5. The Corps either approves or denies the application. If it is approved, the resulting permit may have conditions attached, which the Corps has authority to enforce. A mitigation plan is possible, but not mandatory. A mitigation plan is not even required to be in writing but can be the result of discussion between the Corps and the permittee.
6. The permittee signs and returns the application with a required fee, and the Corps issues the permit.

See MITSCH & GOSSELINK, *WETLANDS*, *supra* note 7, at 644; *see also* NRC COMPENSATING FOR LOSSES, *supra* note 4, at 77 (nationwide permits), 239-84 (Appendix G, Corps' "Standard Operating Procedures for the Regulatory Program").

98. NRC COMPENSATING FOR LOSSES, *supra* note 4, at 12.

99. 33 C.F.R. §325.

100. Civil penalties include assessing \$32,500 per day, per violation.

101. Criminal penalties include fines and/or imprisonment according to whether the act was negligent, knowing, or knowingly caused endangerment. The Act provides for fines of \$2,500 to \$25,000, and up to one year imprisonment for acts that are negligent, \$5,000 to \$50,000 and up to three years for acts that are knowing, and \$250,000 to \$1,000,000 and up to 15 years for acts that are knowing and cause endangerment.

102. The enforcement provisions of §404 appear in two places: §404(h)(1)(G) sets forth that states may use civil and criminal penalties to "abate violations of the permit." Section 404(s) provides the Secretary with the authority to issue a compliance order, and then bring a civil action against a permittee who is not in compliance with the permit.

103. Nationwide permits did not require any mitigation until 1996. 33 C.F.R. §§320-330 (Nov. 13, 1986).

their projects will cause only “minimal impacts”¹⁰⁴ to wetlands,¹⁰⁵ meaning that fewer acres are impacted.¹⁰⁶ While the nationwide permit is reserved for applicants contemplating impacts to one-half acre or less, the nationwide permit program accounts for the majority of permits that require compensatory mitigation.¹⁰⁷ After the permit applicant submits his or her estimated acres of impact, the Corps reviews that estimate.

3. The Mitigation Sequence: Avoid, Minimize, Compensate

A federal permit to dredge or fill in a wetland or other U.S. water is a significant federal action that triggers the Corps’ requirement to follow procedures¹⁰⁸ outlined in NEPA’s implementing regulations.¹⁰⁹ The sequence is reproduced within the §404(b)(1) guidelines.¹¹⁰ The sequence requires

104. The agencies must conduct an environmental review for all federal actions that significantly affect the environment. A permit is considered a significant federal action. The idea behind the general permit program seems to make sense. However, there is an inherent conflict when it comes to “special aquatic sites.” 40 C.F.R. ch. 1, §6.107(e)(ii)(c) declares that “environmentally important natural resource areas such as . . . wetlands”) should have “full environmental review.” Moreover, many other Corps and EPA regulatory provisions echo the demands of accountability of NEPA’s national natural resource “due process.” If wetlands as special aquatic sites warrant full review, does the very methodology of de minimis review of general permits inconsistently gloss over the sensitivity and subordinate the importance of all wetlands? This is analogous to death by a thousand blows.

105. The applicant may apply for a nationwide permit for activities minimally impacting half an acre or less per project and must notify the Corps of all, even minimal, impacts per project over one-tenth of an acre. 67 Fed. Reg. at 2020. Apart from considerations of literal wetland area of impact, the Corps has discretion in interpreting “minimal” and there is no programmatic definition. NRC COMPENSATING FOR LOSSES, *supra* note 4, at 76.

106. Note that this appears to assume an equivalency of functional capacity with quantity of acreage. Although this might be intuitively sound, and even usually reliable, it might not be 100% true, 100% of the time, and thus should be treated as only an assumption. Over time, the definition of “minimal” impact on wetland acreage has gone from 10 acres (1991) to 3 acres (1996) to one-half acre (2001; with notification to the Corps required for fills over one-tenth acre). NRC COMPENSATING FOR LOSSES, *supra* note 4, at 74-75.

107. During fiscal year 2003 (Nov. 1, 2002 to Oct. 31, 2003) the Corps estimates that it issued 4,035 standard permits (larger acreage per impact), and 34,317 nationwide permits (smaller acreage per impact). The Corps has provided the total quantity of impacted acreage for the entire (combined) permit program, but determining the acreage separately ascribed to the standard and nationwide permits for 2003 is not possible from the published data. Bearing this in mind, in 2003 there were 28,000 acres of wetlands filled; 20,000 acres of these were filled via permitted impacts; these impacts were offset by approximately 42,000 acres of compensatory mitigation wetlands. For this and more archival data, see the Corps’ *News and Information: Regulatory Statistics* 2003, <http://www.usace.army.mil/inet/functions/cw/cecwo/reg/> (scroll down to “Regulatory Statistics,” acreage is located in chart 6 of the 8 charts listed; last visited Dec. 17, 2006).

108.

The Corps must discuss mitigation options in its NEPA documentation when examining alternatives to the proposed action . . . federal agencies must consider the need for mitigation to compensate for federal actions (including the granting of a permit), but NEPA does not mandate that the agencies perform or require mitigation (*Robertson v. Methow Valley Citizens Council*, 490 U.S. 332 (1989)).

NRC COMPENSATING FOR LOSSES, *supra* note 4, at 62.

109. The Corps’ NEPA regulations are located at 32 C.F.R. §651.

110. The mitigation sequence is mirrored in the §404 guidelines at 40 C.F.R. §230.10.

the Corps to undertake a public interest review when issuing a §404 permit. Because the United States possesses a government that represents the will of the governed, the public has the right to provide input into how resources are used. Since water is fundamental to life and society, impacts to wetlands represent impacts to a public resource in which the public has an especially significant interest.

The requirements for a public interest review under NEPA and the §404(b)(1) guidelines, involve a hierarchical sequence of steps. Avoidance of the impact is unequivocally stated as the first preference in executing the law.¹¹¹ If the impact cannot be avoided, the next step is minimizing the impacts and compensating for the loss that the impacts will cause. With regard to avoidance and minimization, §1508.20 of NEPA’s regulations requires considerations of alternatives to the proposed activity,¹¹² including resiting all or part of the project to portions of the property that do not feature wetlands or to another property, and redesigning the project to achieve fewer wetland impacts.

The public interest review steps comprise a major portion of the NEPA-mandated environmental assessment process,¹¹³ reiterated in the §404(b)(1) guidelines,¹¹⁴ which results in an EA, prepared to determine whether or not an impact is significant. If the Corps determines that the impact is significant, this finding triggers the preparation of a full-blown environmental impact statement.

By requiring consideration of avoidance of the impact altogether, followed by minimization, then, only when necessary, compensation for the loss through mitigation,¹¹⁵ the framework and conceptual basis for decisionmaking are inherently logical and comprise the analytical engine of the §404 program. This engine is designed to drive agency staff and landowners toward actions on the land that effectively support the achievement of the nation’s stated CWA goals.¹¹⁶ The use of avoidance as the first step is proactive:

111. For an analytically meticulous and conscientious critique of the beauty and flaws of NEPA, including the Act’s interstices with §404, see Bradley C. Karkkainen, *Toward a Smarter NEPA: Monitoring and Managing Government’s Environmental Performance*, 102 COLUM. L. REV. 903 (2003). See also Timothy J. Hagerty, *Beyond Section 404: Corps Permitting and the National Environmental Policy Act*, 32 ELR 10853 (July 2003).

112. NEPA, 42 U.S.C.A. §4332(c)(iii) and 40 C.F.R. ch. V, §1502.14(f), which apply to “the policies, regulations, and public laws of the United States” which shall be “interpreted and administered in accordance with the policies set forth in [Ch. 55 National Environmental Policy, which contains NEPA §4332],” and applies to “all agencies of the Federal Government” “to the fullest extent possible” through the first paragraph of §4332 (or NEPA §102). See also Corps NEPA regulations at 32 C.F.R. ch. V, subpt. B, 651.7(a), 651.8 (b)(2), 651.13, subpt. E, 651.22(h), requiring an environmental assessment (EA) for actions affecting wetlands, and perhaps especially Appendix F to 32 C.F.R. ch. V, subpt. 651 (2001) directly tying 1978 Council on Environmental Quality regulations for implementing NEPA to Corps’ mitigation.

113. See *supra* note 111.

114. The guidelines’ mitigation sequence is located in 40 C.F.R. §230.10.

115. 1990 MOA, *supra* note 56, §III(A). The NRC Report points out that “[H]abitat development and restoration techniques can be used to minimize adverse impacts and to compensate for destroyed habitat.” Seen in this light, conceptually mitigation is a subset of minimization of impact. NRC COMPENSATING FOR LOSSES, *supra* note 4, at 65.

116. In fact, the §404 guidelines, which are legally binding, underscore this in 40 C.F.R. §230.1 (Purpose and Policy):

(a) The purpose of these Guidelines is to restore and maintain the chemical, physical, and biological integrity of water of the United States through the control of discharges of

avoidance is effective prevention of water quality problems in the first instance.¹¹⁷ In fact, the December 2002 National Wetlands Mitigation Action Plan and the Corps and EPA's recent March 2006 mitigation rulemaking announcement¹¹⁸ both underscore the importance of avoidance to the effectuation of the CWA's goals.¹¹⁹ A presumption of avoidability is stated multiple times throughout the various regulations.¹²⁰

If the wetland impact is not avoidable, then the permit applicant must propose steps to minimize the harm.¹²¹ The guidelines list possible minimizing actions that include relocating the discharge, changing the method or timing of discharge, devising post-discharge containment of the material, and so forth. When contemplating minimization, the applicant may take into account practicability,¹²² economic

dredged or fill material. (b) Congress has expressed a number of policies in the Clean Water Act. These Guidelines are intended to be consistent with and to implement those policies.

117. Imagine the economy of this proposition: although the private landowner would likely complain of his financial loss, because of having to resite his project, that cost is actually dwarfed by the actual cost of wetland degradation and of subsequent mitigation actions, costs both directly to him or her and to all of us, the larger community. The actual cost is staggering in terms of upfront, short-term costs and less obvious long-term costs to the watershed and those organisms, including humans, reliant upon it.
118. Notice: Compensatory Mitigation for Losses of Aquatic Resources, 71 Fed. Reg. 15519 (Mar. 27, 2006), *available at* <http://www.epa.gov/wetlandsmitigation/> (last visited Dec. 15, 2006).
119. The December 2002 Action Plan states:

Importantly, the regulatory program provides first that all appropriate and practicable steps be taken to avoid impacts to wetland and other waters, and then that remaining impacts be minimized, before determining necessary compensatory mitigation to offset remaining impacts. This mitigation sequence parallels that which is embodied in the National Environmental Policy Act governing the review of other federal actions as well. Compliance with these mitigation sequencing requirements is an essential environmental safeguard to ensure that Clean Water Act objectives for the protection of the Nation's remaining wetlands are achieved.

National Wetlands Mitigation Action Plan, *supra* note 23, at 1.

120. For example, the guidelines express the presumption in 40 C.F.R. §230.1: "(c) Fundamental to these Guidelines is the precept that dredged or fill material should not be discharged into the aquatic ecosystem" and (d) "The guiding principle should be that degradation or destruction of special sites may represent an irreversible loss of valuable aquatic resources." Also, §230.10(a)(3) states that if the proposed activity is not "water dependent," then "practicable alternatives that do not involve special aquatic sites [i.e., wetlands] are presumed to be available, unless clearly demonstrated otherwise," and discharges that do not take place in aquatic sites are presumed to have less adverse impacts (in §230.10(3)). Finally, §230.6(c) states that "[t]he presumption against the discharge in §230.1 applies to this decision-making," referring to "consideration [of information regarding] both individual and cumulative impacts to support the decision of whether to specify the site for disposal of dredged or fill material and to support the decision to curtail or abbreviate the evaluation process."
121. If the impact is "unavoidable," then the applicant proceeds to evaluate steps to minimize the impact (40 C.F.R. §230.70), and which mitigation measures might be necessary (quantity, quality, actions, and measurable objectives of restorative work). The provisions that explain how to determine when an impact is avoidable or not are located in the §404(b)(1) guidelines (in particular, see §§230.5(c) and 230.10). It is the proponent of the fill project who is responsible for assessing the environmental impact of his or her actions. Corps' NEPA regulations, 32 C.F.R. ch. V, pt. 651.23.
122. Among other practical considerations is the dependence of the landowner's project on water, which came to be known as the "water dependency test," which is part of the considerations outlined in 33 C.F.R. ch. II, §§320.4(a)(2) and (g)(3) (the Corps' general regula-

considerations, and the project's perceived human benefit (for example, the construction of a resort, a subdivision, or a new highway). The perceived human benefit is construed to society at large, not to the individual stakeholder. This societal benefit is more capable of being weighed with the countervailing public interest of maintaining the environment in question as is, with zero impact.¹²³

If the analysis must proceed beyond minimization, the final step is the consideration of compensatory mitigation: a determination of which actions are required to compensate for the wetland values lost through the adverse, but unavoidable impacts. Before drawing up a plan of mitigation actions,¹²⁴ the permit applicant and the Corps must systematically assess the relevant wetland functions for which compensation will be necessary.

4. The Assessment of Wetland Functions and Values

The CWA §404 guidelines require the Corps to evaluate the need for the proposed project, the quality of wetland functions and values present, and the impacts of the project on the wetland. The required value considerations are contained in more than one provision in the relevant regulations.¹²⁵ "General Policies for Evaluating Permit Applications"¹²⁶ requires the Corps to consider several key ecological and functional criteria¹²⁷ that evince the necessity of careful and conscientious consideration of wetland values. However, the provision does not provide the Corps with

the regulations further state that an alternative is practicable if it is

available and capable of being done after taking into consideration cost, existing technology and logistics in light of overall project purposes. If it is an otherwise practicable alternative, an area not presently owned by the applicant which could reasonably be obtained, utilized, expanded or managed in order to fulfill the basic purpose of the proposed activity may be considered.

Id. §320.10(a)(2).

123. 33 C.F.R. ch. II, §320.4(a)(2).

124. *See infra* note 134.

125. Most important are the 33 C.F.R. §320.4 passages, which apply to all permit programs that the U.S. Department of the Army oversees, including the §404 program. See 33 C.F.R. §320.2(f), authority to issue permits under §404 of the CWA, and 33 C.F.R. §320.4, particularly §320.4(b) *Effect on Wetlands*. Also relevant is 40 C.F.R. ch. 1, pt. 230.

126. 33 C.F.R. §320.4.

127. *Id.*

(i) Wetlands which serve significant natural biological functions, including food chain production, general habitat and nesting, spawning, rearing and resting sites for aquatic or land species; (ii) Wetlands set aside for study of the aquatic environment or as sanctuaries or refuges; (iii) Wetlands the destruction or alteration of which would affect detrimentally natural drainage characteristics, sedimentation patterns, salinity distribution, flushing characteristics, current patterns, or other environmental characteristics; (iv) Wetlands which are significant in shielding other areas from wave action, erosion, or storm damage. Such wetlands are often associated with barrier beaches, islands, reefs and bars; (v) Wetlands which serve as valuable storage areas for storm and flood waters; (vi) Wetlands which are ground water discharge areas that maintain minimum base flows important to aquatic resources and those which are prime natural recharge areas; (vii) Wetlands which serve significant water purification functions; and (viii) Wetlands which are unique in nature or scarce in quantity to the region or local area.

guidance on when or how to measure, weigh, or objectively evaluate those values to aid the agency in deciding on whether to issue a §404 permit.¹²⁸ Moreover, even Corps ecologists may not always agree on methods or end results of wetland valuation, or the scope of factors to be considered.¹²⁹

It is the permit applicant, not an ecologist, who provides statements in the application attesting to the physical qualities of the pre-impact wetland in question.¹³⁰ The Corps relies upon these statements in making permit decisions, and the accuracy of the statements describing the wetland to be impacted is almost never verified due to lack of agency personnel and budget.¹³¹

The lack of field verification constitutes a barrier to the Corps' ability to accurately determine the quality and quantity of mitigation to require of the permittee. The initial lack of verification could impede the ability of the Corps to monitor and enforce permit conditions, after mitigation projects have begun or are eventually completed. The Corps and the other agencies involved have formed an interagency working group to deal with the field verification and other issues that the NRC Report raised.¹³²

128. The regulations contained in 33 C.F.R. ch. II, §325 (Corps' Regulations on Processing of Department of the Army Permits) contain comprehensive information about the permit process, including §325.4 "Conditioning of Permits." Provision 325.4(d) is of special interest in light of the number of mitigations that are never undertaken, or are undertaken but never completed. This section states that the district engineer may require the permit applicant to post a bond if he "has reason to consider that the permittee might be prevented from completing work which is necessary to protect the public interest." In its review, the NRC noted several studies from a spectrum of states and climates indicating mitigation failure for multiple reasons. A major reason for failure is lack of compliance with §404 permit conditions. In one study involving data from at least nine states,

[b]etween 70% and 76% of the mitigation required in the permits is implemented, and about 50% to 53% of the implemented mitigation projects did not meet the permit requirements. In addition, the estimate of functional equivalency of mitigation was about 20% of that intended. These estimates . . . suggest that there is a substantial net loss in wetland area from [the] wetlands permitting program. In terms of the ecological equivalency of these wetlands, there is a low value of the wetlands actually built.

NRC COMPENSATING FOR LOSSES, *supra* note 4, at 120. In another study that NRC reviewed, only 30 of 80 mitigation projects were compliant with their permits. *Id.* at 117-18.

129. Interestingly, some ecologists point out that many formal attempts at valuation are seriously flawed either by (1) promoting a rather whimsical privileging of a severely circumscribed set of values at the expense of other crucial values, in a blindly methodical manner, or by (2) blending values, specifically habitat values, in order to achieve a more integrated approach (note the word "integrated" has infiltrated the semantics recently used by Corps) but one that thereby achieves habitat which supports few species. MITSCH & GOSSELINK, *WETLANDS*, *supra* note 7, at 594.
130. The permittee also may propose mitigation measures, but may not—it is not mandatory. Of primary concern, before even reaching these issues, is the "which" qualifier in the legislation itself, parts (i) through (viii) that eviscerates the whole regulation by allowing the permit applicant, or defendant landowner, arguably seldom an aquatic expert, to state of his or her wetlands, "mine are not unique, do not serve any special functions," and so forth when describing them in the permit application.
131. NRC COMPENSATING FOR LOSSES, *supra* note 4, at 102.
132. President George W. Bush's December 2002 "National Wetlands Mitigation Action Plan" mandated this interagency group. National Wetlands Mitigation Action Plan, *supra* note 23, at 1. By March 2006, the interagency group had completed several of its tasks leading up to the open public comment period toward a new rule that ad-

The §404 guidelines require the Corps to make factual determinations in advance of the project's wetland discharge, in order to support the measurement, weighing, and evaluation of wetland functions and values concerned and thus the permit application.¹³³ Factual determinations are the most objective part of the process and offer verifiable benchmarks as well as comparative data over time. However, beyond empirical factual determinations, the Corps is allowed broad discretion throughout its permit decisionmaking.¹³⁴

The Corps makes §404 permit decisions about wetlands under private, state, or local control by weighing "public interest factors,"¹³⁵ including the wetlands' "values" against the permit applicant's statements regarding the need to fill the wetland. Some of these considerations of the public interest are known as "significant issues of overriding national importance."¹³⁶ In addition to navigation, the significant issues that the regulatory scheme describes include: national security, national economic development, water quality,¹³⁷ preservation of special aquatic sites (including wetlands)¹³⁸ with significant interstate importance, and national energy needs.¹³⁹ Moreover, the Corps exercises its decisionmaking discretion in the presence of two powerful influences: (1) rights associated with private property ownership¹⁴⁰; and (2) traditional state powers of land use planning and zoning.¹⁴¹

In exercising its agency discretion over the factual determinations to assess wetland values, the Corps considers the "degree of impact,"¹⁴² against the weight of the values and the factual determinations derived from study of the subject

dresses much of the NRC's 2001 concerns. *Notice: Compensatory Mitigation for Losses of Aquatic Resources*, 71 Fed. Reg. at 15519, available at <http://www.epa.gov/wetlandsmitigation/> (last visited Apr. 30, 2006).

133. 40 C.F.R. §230.2 (2001).
134. Much of the Corps' discretion may be traced to its delegated authority from Congress, which has plain power to regulate commerce.
135. The Corps is required to comply with its own regulations, NEPA, the CWA, and the §404(b)(1) guidelines simultaneously when issuing permits to fill or dredge a wetland. The public interest factors that must be considered occur in the NEPA environmental review of the permit action. However, "in reviewing Army Corps of Engineers' determination that permits issued pursuant to §404 of [the] Clean Water Act (CWA) would not be contrary to [the] public interest, the court must give Corps' determinations substantial deference." *Airport Communities Coalition v. Graves*, 280 F. Supp. 2d 1207 (W.D. Wash. 2003).
136. Significant issues of overriding importance are discussed at 33 C.F.R. §§320.4(j)(2)-(4).
137. The status of a watershed's water quality can be directly factored into the scoping process (the "avoid, minimize, mitigate" steps of preparing a NEPA §404(b)(1) EA) and in planning for projects that compensate for the loss of wetland functions.
138. Wetlands are labeled a "special aquatic site" also in 40 C.F.R. ch. 1, pt. E, the §404(b)(1) guidelines.
139. *Id.* "Whether a factor has overriding importance will depend on the degree of impact in an individual case." Note the circular reasoning this provision requires, which also necessitates invocation of the Corps' wide discretion to judge "degree of impact," resulting in standardless "factors" incapable of consistent application.
140. Private property rights with regard to wetlands are touched on in 33 C.F.R. §320.4(g).
141. "The district engineer will normally accept decisions by such governments on those matters unless there are significant issues of overriding national importance." 33 C.F.R. §320.4(j)(2).
142. Considerations of the gravity of the impact occur throughout 33 C.F.R. §320, §323.4(c), §325, and §328, and the §404(b)(1) guidelines (40 C.F.R. ch. I, §230).

wetland.¹⁴³ It seems ironic that under the §404 guidelines, the Corps apparently considers degree of impact even when dealing with a wetland that the Agency acknowledges to possess sufficient values that cause it to rise to the special level of embracing significant issues of overriding national importance. By regulatory definition, wetlands are already sufficient special aquatic areas, with significant interstate importance,¹⁴⁴ which necessarily involve significant issues of overriding national importance.¹⁴⁵ These national issues include improvement of water quality—a service that all wetlands provide¹⁴⁶ and which the CWA is designed to maintain and improve.¹⁴⁷

These special designations in the regulations are weighed against the degree of impact. Impacts that the Corps discretionally might judge to be slight, insignificant, or inconsequential¹⁴⁸—in the case of a single wetland §404 permit review—could eclipse considerations of national value.¹⁴⁹ In fact, the degree-of-impact provision in the regulations cited, is also theoretically in disharmony with an important NEPA¹⁵⁰ and §404 concern regarding the need to consider long-term effects on the environment, effects that occur through the cumulative impacts of incremental or piecemeal changes¹⁵¹ to the environment, including wetland

filling or dredging allowed through the §404 permit program. In consideration of direct, indirect, and cumulative impacts¹⁵² that are incremental, there is a link to hidden but significant long-term costs that seem incapable of fitting into the calculation.¹⁵³

5. Significant Regulations and Documents Beyond §404

Multiple guidance documents and memoranda also contribute to the regulatory picture, although these are in the nature of policy and guidance, and do not possess the status and enforceability of law.¹⁵⁴

The most significant document in this last category is the Corps' 2002 guidance stating that individual permits and general permit verifications requiring mitigation shall con-

Thus, the particular wetland site for which an application is made will be evaluated with the recognition that it may be part of a complete and interrelated wetland area. In addition, the district engineer may undertake, where appropriate, reviews of particular wetland areas in consultation with the Regional Director of the U.S. Fish and Wildlife Service, the Regional Director of the National Marine Fisheries Service of the National Oceanic and Atmospheric Administration, the Regional Administrator of the Environmental Protection Agency, the local representative of the Soil Conservation Service of the Department of Agriculture, and the head of the appropriate state agency to assess the cumulative effect of activities in such areas.

33 C.F.R. §320.4(b)(3).

152. See MITSCH & GOSSELINK, *WETLANDS*, *supra* note 7, at 27.

153. The long-term costs include water degradation, drought, species extinction, and flooding. Nowhere is there a place in the regulations to weigh larger environmental *qua* social costs against the implied costs of “practicable” or “feasible” mitigation for impacts to wetland values. In other words, short-term costs foregone could result in deferred and possibly catastrophic long-term costs. For a current case study, the forty billion dollar price tag of restoring Louisiana’s historical coastal wetlands may generate more serious discussion on these crucially important but not-as-yet prominent issues. Since Hurricane Katrina in fall 2005, the U.S. Gulf Coast wetlands are receiving prominent media attention that may yield more serious management efforts and government funding for restoration. On Jan. 22, 2006, the figure of square yards of land lost since January 1, 2006 was over 78,000,000 square yards. For current information, see America’s Wetland website <http://www.americaswetland.com/>.

154. These documents, although important, are neither subject to the rigors of the Administrative Procedure Act (5 U.S.C. ch. 5) requirements for rulemaking, nor the broader constitutional requirements of congressional oversight and lawmaking. The pertinent documents include the FWS mitigation policy important for its revolutionary inclusion of a checklist of ecology-based mitigation goals (46 Fed. Reg. 7656 (Jan. 23, 1981; corrected Feb. 4, 1981)), the advisory 1990 MOA between the Corps and EPA, and the Corps’ Regulatory Guidance Letter 01-1 (also known as REGL 101, Oct. 31, 2001) that adopted eleven ecosystem-based criteria directly from the 2001 NRC Report (cite REGL 101). REGL 101 was superseded by REGL 202 (Dec. 24, 2002), which is still in use as the agencies review the public comments in their deliberation on the currently proposed formal rule. REGL 202 reiterated the Corps’ commitment to the watershed approach to wetland mitigation decisionmaking (that the Corps stated previously in its January 2002 notice regarding issuance of nationwide permits; 67 Fed. Reg. at 2020). REGL 202 also included the stated preference for districts to include (“should include” mitigation plans, and the preference for hard baseline data (“should include” this data) during planning in advance of mitigation. The desire to include the protection or provision of vegetated buffers and uplands associated with wetlands in the mitigation ratio is an innovation (and response to NRC and field scientists) that first appeared in the Corps’ January 2002 notice. This inclusion indicates the Corps’ acknowledgment of these associated landscapes’ importance to water quality considerations, and to whether or not the ecosystem thrives long-term and independently of human intervention or manipulation.

143. For the sake of continuity from the earlier discussion of the professed lack of concrete data on the wetlands that were destroyed in advance of mitigation projects, consider for a moment the danger (and lack of accountability) of gross subjectivity in designations of “insignificant” versus “significant,” and “consequential” versus “inconsequential,” and even “indirect” versus “direct” with regard to the universe of impacts on wetlands, recalling that most of them occur on privately held lands in publicly, i.e., nationally, critical watersheds.

144. 40 C.F.R. ch. 1, pt. E.

145. 33 C.F.R. §§320.4(j)(2)-(4).

146. *Id.*

147. 33 U.S.C.A. §1251 (West 2000).

148. The term “inconsequential” is the implied definition of *de minimis*, for purposes of the guidelines governing when a nationwide or general permit is sufficient. To be fair, this is inferred by analogy to the definitions provided by the so-called “incidental fallback” definitions that designate which differing dredged materials require a §404 permit for redeposit. See 33 C.F.R. ch. II pt. 323.2(6): “For purposes of this section, an activity associated with a discharge of dredged material degrades an area of waters of the United States if it has more than a *de minimis* (i.e., inconsequential) effect on the area by causing an identifiable individual or cumulative adverse effect on any aquatic function.”

149. Recall that “minimal impact” in the nationwide permit means “minimal” with regard to the amount of acreage being impacted. Projects must be considered in their entirety if logically connected, which helps avoid the potential piecemeal impact of wetlands as a legal loophole. See 40 C.F.R. ch. I, §230.7.

150. The concern involves cumulative effects, seemingly analytically inclusive of a series of inconsequential “*de minimis*” effects over a long period of time. The NEPA regulation is perhaps more precise:

Cumulative impact is the impact on the environment (note it is not limited to an impairment of “wetland resources”) which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

40 C.F.R. §1508.7.

151.

Although a particular alteration of a wetland may constitute a minor change, the cumulative effect of numerous piecemeal changes can result in a major impairment of wetland resources, as 40 C.F.R. ch. I, §230.12(g)(1) acknowledges.

tain special conditions.¹⁵⁵ These conditions will identify four factors: (1) responsible party; (2) performance standards; (3) financial/real estate/monitoring program assurances; and (4) a contingency plan. This paragraph provided invaluable NRC-directed support to the §404 permit program guidelines and its goals are embodied in the 2006 proposed rule.

The Corps' 2002 guidance also announced a preference for mitigation that is in advance of or concurrent with mitigation impacts to "reduce temporal losses of aquatic functions" and to facilitate compliance.¹⁵⁶ The document states that districts will require a Corps-approved written mitigation plan in circumstances where mitigation takes place after construction.¹⁵⁷ Requiring mitigation in advance of, or concurrent with, the timeline of permitted wetland impacts is a proactive idea put forth by Prof. Royal C. Gardner¹⁵⁸ and the NRC Report. The 2006 proposed new rule appears to take the next three proactive, logical steps. The rule would: (1) require a Corps-approved mitigation plan in all cases requiring mitigation; (2) require advance or concurrent mitigation and prohibit after-the-fact mitigations unless there has been an unforeseen impact or magnitude of impact; and (3) make these requirements legally binding and enforceable via including them in new provisions of the §404 guidelines.

The ideal contents of a mitigation plan are listed in §3.d. of Regulatory Guidance Letter (REGL) 02-2.¹⁵⁹ The remaining sections deal with site protection and contingency planning as well as transfer of ownership of mitigation projects via conservation easements and land trusts. The 2002 guidance notes that the normal time for monitoring mitigation sites will be 5 to 10 years; this was evidence that the Corps acknowledged that mitigation is now known to take longer than had originally been thought. An enlarged time for monitoring is a major step in the right direction. The effectiveness of the Corps' elongation of the mitigation monitoring period proposed from 5 to 10 years will remain to be seen.¹⁶⁰

155. U.S. Army Corps of Engineers Regulatory Guidance Letter Number 02-2, Dec. 24, 2002 (or REGL 02-2) §2.1. This document and other Corps' Regulatory Guidance Letters are available (indexed by year), <http://www.usace.army.mil/cw/cecwo/reg/rglsindx.htm> (last visited Dec. 17, 2006).

156. See *supra* Part II.

157. See *id.*

158. Royal C. Gardner, *Money for Nothing? The Rise of Wetland Fee Mitigation*, 19 VA. ENV'T. L.J. 41 (2000). Professor Gardner was a member of the committee that wrote the 2001 NRC Report.

159. The factors are: boundaries with maps and drawings, construction details, water source and logistics, native vegetation proposed, natural revegetation progression considerations, invasive plant awareness and plan, elevation and slope measurements and relationship to hydrology, erosion plan, open water geomorphology, and maintenance planning.

160. The problem of assigning proper monitoring duration is thorny because a solution requires more than just revised text. From an administrative point of view, anything longer than five years becomes burdensome, and perhaps even less likely to be acted upon, or enforced. The ongoing monitoring of the mitigated wetland (whether by the permittee, the Corps, or a third party) adds costs, as well. There must be reasonable alternatives. For some projects, such an alternative could lie in the use of mitigation banks and conservation easements, whereby the deed to the mitigation wetland property might be transferred at the end of five years to an organization that would serve as a trustee and steward of the mitigated lands. This idea is appealing to other commentators. NRC COMPENSATING FOR LOSSES, *supra* note 4, at 152; see also Royal C. Gardner, *Money for Nothing?*, *supra* note 158, at 41.

B. Defining Success: Key Points of the 2001 National Research Council Report Illuminated

In ecological terms, mitigation success depends on many elements that we might consider predictive. Four fundamental factors that contribute to successful mitigations are: (1) establishment of an independent hydrological regime; (2) a well-chosen wetland classification capable of successful mitigation; (3) an appropriate location in the landscape; and (4) sufficient time to become fully established.¹⁶¹

The NRC Report states that the key question regarding whether we are capable of fully mitigating the loss of wetland functions, i.e., whether we can restore them in a degraded system, or replicate them entirely anew in separate locations, depends on the interrelationship of each function, the level of existing degradation, and several other factors.¹⁶²

The NRC Report found that restoration tends to be the most successful form of mitigation because of the possibility of reestablishing a historical hydrological connection between the wetland to be restored and its predisturbance water sources.¹⁶³ Conversely, the NRC found that a major cause of mitigation failure across restoration, enhancement, or creation projects was the failure to sufficiently establish a reliable hydrological connection, which is by far the most crucial factor in determining mitigation success.¹⁶⁴ There can be no fully functioning wetland of any type without a self-sustaining connection to water.¹⁶⁵ Beyond this, the quality of the connection will determine how well and how quickly a restored or replaced wetland will become established and its processes self-maintained, as well as the wetland's ultimate character.¹⁶⁶

In recognition of the critical relationship of the water present to its adjacent soil, the NRC Report pointed out that the mitigated wetlands studied were far more likely to be open water ponds, regardless of the wetland type dredged or filled.¹⁶⁷

161. NRC COMPENSATING FOR LOSSES, *supra* note 4, at 35, 106.

162. *Id.* at 27.

163. *Id.* at 125. "Wetland restoration is generally more feasible than wetland creation." *Id.* at 672.

164. *Id.* at 35, 106; MITSCH & GOSSELINK, WETLANDS, *supra* note 7, at 1, 108.

165. Hydrology refers to the quantity, movement, velocity or energy, flow, frequency, and physical source (precipitation, stream flooding, seeps, springs, runoff) of water in its relationship to the land. MITSCH & GOSSELINK, WETLANDS, *supra* note 7, at 107-09.

166. NRC COMPENSATING FOR LOSSES, *supra* note 4, at 125-26. Mitsch and Gosselink agree. MITSCH & GOSSELINK, WETLANDS, *supra* note 7, at 686. "Hydrology is probably the single most important determinant of the establishment and maintenance of specific types of wetlands and wetland processes." *Id.* at 108. Yet the authors state: "It is curious that so little attention has been paid to hydrologic measurements in wetland studies, despite the importance of hydrology in ecosystem function." *Id.* at 151.

167. The problem of trading high-functioning and diverse natural marshes for low-functioning ponds is ongoing. In May 2006, the FWS released a report that asserted the first "net gain" in wetlands since 1954. The report is able to claim the net gain by including the more predominant ponds in wetland acreage reports (covering 1998 to 2004). The report indicates that 523,500 acres of native wetlands were lost and that 715,300 acres were gained, but the figure includes watercourses excavated to hold stormwater, and the types of ponds found in golf courses and subdivisions. The FWS' "fact sheet" accompanying the report states:

Freshwater pond acreage increased by almost 700,000 acres from 1998 to 2004, a 12.6 percent increase in area. This was the largest percent increase in area of any wetland type in this

The NRC identified a series of profound ecological implications with this limitation.¹⁶⁸

Compared with the spectrum of services that various types of wetlands contribute, open water ponds¹⁶⁹ offer the least ability to purify water and decompose organic and inorganic waste and debris, the least ability to attenuate floods, and the least species diversity support for plants and animals.¹⁷⁰ We can adapt past restoration practices to ensure that replacement wetlands are diverse in form. Instead of a one-size-fits-all approach, we must more closely align replacement wetlands with what functions were lost and what the mitigation site's landscape and hydrology dictate. The proposed rule's inclusion of the new requirement for baseline data from the pre-impact wetland is an enormous step forward to successful field projects that seek to mitigate actual, on-the-ground impacts.

Since mitigation approaches vary so widely, examining best and worst practices requires the vantage point of hindsight. As the reader might predict, there is a cost-benefit balancing constantly taking place in advance of mitigation out in the field that has led to too many cheap, quick mitigation techniques that yield poor results. Besides replacing complex ecosystems with ponds, the 2001 NRC Report cited the common but poorly chosen practice of soil removal in preparation for constructing wetlands as a practice that predisposes the constructed wetlands toward failure to sustain themselves or to thrive.¹⁷¹ Mechanical scraping down to an underlying layer of rock has often been done during the construction of mitigations that subsequently fail. Scraping deepens the constructed basin for the created wetland so as to more likely establish a hydrologic connection. Soil scraping or dredging in a native wetland, however, is a damaging practice for reasons stated above: the soil (either dry-land soil or the top layer of the wet-soil bed underlying wetlands)

study. Some of these acreage gains were offset by loss of freshwater wetlands to development and managed forest plantations. Urban and rural development combined accounted for an estimated 61 percent of the wetlands lost between 1998 and 2004.

T.E. DAHL, STATUS AND TRENDS OF WETLANDS IN THE COTERMINOUS UNITED STATES (2006), available at http://wetlandsfws.er.usgs.gov/status_trends/index.html.

168. NRC COMPENSATING FOR LOSSES, *supra* note 4, at 106. "Higher water tables would reduce the amount of organic matter decomposition." M.H. Stolt et al., *Spatial Variability in Palustrine Wetlands*, 65 SOIL SCI. SOCIETY AM. J. 531 (2001). In their study of five forested and scrub-shrub wetlands in Virginia, M.H. Stolt and her colleagues also noted that "sites with longer periods of saturation at or near the soil surface often have higher amounts of organic C [carbon] because the anaerobic conditions retard decomposition of the plant remains." *Id.* at 534. Moreover, "[t]he resulting lack of oxygen prevents plants from carrying out normal aerobic root respiration and strongly affects the availability of plant nutrients and toxic materials in the soil." MITSCH & GOSSELINK, WETLANDS, *supra* note 7, at 165.
169. NRC COMPENSATING FOR LOSSES, *supra* note 4, at 105-06.
170. *Id.* at 395.
171. The 2000 NRC Report notes that

[i]n wetland restoration and creation projects, soil is generally viewed as merely a rooting medium for the plants that are desired. The soil that has developed in situ at a wetland creation site is often scraped off to attain a surface elevation that will allow the site to become flooded or intersect the water table.

This practice leaves behind impervious hard rock bed, comparatively devoid of life. In fact, the report lists nine crucially important functions performed by using appropriate soil. *Id.* at 4.

contains the processes and organisms engaged in breaking down and recycling organic matter—this layer is itself a living system. One type or layer of soil (silt, sand, clay, rock, for example) is not equivalent to, or a substitute for, another. A thriving biological community will not reestablish itself on the bedrock underlying the layers that were removed.¹⁷² A diverse community of soil organisms and plants requires an intact original seedbank, naturally occurring in the soil in and around the wetland and its associated upland. Thus the native soil must be retained (in place or moved to the site of the replicated wetland) rather than discarded in order to promote the reestablishment of a complex biotic community. In order to eliminate worst practices, the proposed new rule would standardize recognized good practices in order that "providers of high-quality aquatic resource replacement projects are not at a competitive disadvantage to others meeting different and lower standards," according to EPA's Palmer Hough and the Corps' Mark Sudol.¹⁷³

Common sense predicts that mitigation can be successful in inverse proportion to the degree to which the entire system, including the hydrological connection, is degraded or damaged.¹⁷⁴ Accordingly, a slightly degraded system has a higher chance of recovery if sound mitigation techniques are applied, depending on other factors. For example, is the wetland in a less-pressured rural area, in the middle of an older, heavily industrial area, or in a swiftly encroaching urban area? A very damaged system is tougher to mitigate, in general, depending also upon other factors.¹⁷⁵ The continuing loss of wetland values and mitigation are both expensive; planning that achieves the most functionality and long-term sustainability is cost-effective and serves the best interests of watersheds and people.

The Corps' records reflect that due to enforcement of §404 permit conditions, there was a net gain of 50,000 ha of wetlands and associated uplands from October 1993 to September 1999. This asserted net gain derives from permitted destruction of 68,900 ha of wetlands and the restoration, enhancement, creation, or preservation of 118,800 ha of wetlands and associated uplands.¹⁷⁶ There is no way to discern which wetland values contributed by which wetland classifications were lost or compensated for. The Corps' re-

172. *Id.* at 32-24.

173. Palmer Hough & Mark Sudol, *Improving Aquatic Resource Replacement Projects Through Federal Rulemaking*, NAT'L WETLANDS NEWSL., May/June 2006.

174. NRC COMPENSATING FOR LOSSES, *supra* note 4, at 28, 34.

175. The level of degradation dictates the appropriate course of action; "degradation is a function of damages to both the watershed and the immediate site." *Id.* at 34-35. (The question of initial degradation of the wetland candidate for mitigation, while highly relevant in a restoration proposal, also has other, more cautionary implications for wetland regulation and its future, mainly three: (1) more relaxed permit standards, (2) societal "shifting baselines" whereby we become gradually accustomed to increasingly degraded systems, and (3) an expensive foundation for future sprawl, as former mitigation wetlands are merely paved over in later years.)

176. See MITSCH & GOSSELINK, WETLANDS, *supra* note 7, at 657. In addition to the lack of information on the replacement of functions, it is difficult to make sense of the asserted net gain of 49,100 in other ways. If we subtract the permitted area (68,900 ha of wetlands taken) from the mitigated area (118,800 ha, which includes uplands) it does not add up to one-to-one acreage replacement. The authors remind us that 47.300 million ha were lost from pre-European settlement to the 1980s, and "at this rate it would take over 600 years to recover 10% of our lost wetland resources." By way of contrast, the NRC called for the restoration of almost 10% of our lost wetlands (4 million ha) by the year 2010.

ports indicate only the quantity of lost and gained wetland acres, not functions, during those six years.¹⁷⁷ The NRC Report states that mitigation wetlands in these studies yielded about 20% of the functional equivalency they had been intended to replace.¹⁷⁸ The discrepancy between the Corps' claims and the NRC's comment on functional equivalency plainly points out that the expedience of conflating acreage quantity and wetland functions can be like comparing apples and oranges.

Moreover, the NRC's comparative study of mitigation sites with undisturbed sites evaluated "success" according to a variety of criteria. The committee also noted that although vegetation is easily measured during monitoring, and often used as such, in isolation it is "a poor indicator of function."¹⁷⁹ This is because some wetland types, even in a healthy state, have little vegetation, while other types have abundant plant cover including canopy.¹⁸⁰ Another reason that vegetation is not an effective sole indicator of a fully functioning wetland is that there may be dominant vegetation that is easily observed (such as quickly spreading cat-tails or invasive plants) but which does not reflect a balanced, diverse community of native plants.¹⁸¹

In summary, what is known to date about wetlands as complex systems and their constituent parts indicates that mitigation should be used only as a last resort. Then, state-of-the-art mitigation guidelines and methods should be applied only to wetland types that have been successfully restored or created. No less important, the landscape's timescale must be taken into account—there must be some allowance made in planning for a more elongated time frame. Finally, baseline data gathered before wetland impact and during monitoring are indispensable in evaluating wetland quality and success, and in enforcing the permit holder's legal obligations. If we apply what we have learned through studies of mitigation failure and success, we can derive a set of best practices for the future. Only by doing so will we have any hope of achieving no net loss. The

agencies' spring 2006 proposal to require both baseline data and a written mitigation plan is responsive to some key NRC concerns.

C. The March 2006 EPA/Corps Joint Notice of Proposed Regulations

In March 2006, the Corps and EPA announced an open public comment period in advance of making a formal rule on compensatory mitigation. The 38-page notice contains abundant evidence that the two agencies have paid attention to the recommendations in the 2001 NRC Report.¹⁸²

The new rule will affect 33 C.F.R. §325, "Processing of Department of the Army Permits," and §332, "Compensatory Mitigation for Losses of Aquatic Resources," as well as 40 C.F.R. §230, "Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged and Fill Material."¹⁸³ The main objectives of the new rule are to adopt new compensatory mitigation standards based on the NRC's recommendations, to increase the "efficiency and predictability of the process of proposing compensatory mitigation," to enhance public participation in compensatory mitigation decisions. An interesting fourth objective is to "create a level playing field among the three compensatory mechanisms [meaning the mechanisms of in-lieu fee mitigation, mitigation banking, and permittee-responsible mitigation]." This is a recommendation of many experts, including Professor Gardner.¹⁸⁴

The Corps and EPA appear to be furthering their previously adopted "watershed approach" in the 2006 proposed rulemaking stating that "[i]deally, the watershed approach is based on a formal watershed plan, developed by Federal, state, and/or local environmental managers in consultation with affected stakeholders."¹⁸⁵ The 2006 notice states that

182. See Palmer Hough & Mark Sudol, *Improving Aquatic Resource Replacement Projects Through Federal Rulemaking*, NAT'L WETLANDS NEWSL., May/June 2006, at 31. The authors explain that the rulemaking addresses the 23 most salient of the NRC's 29 recommendations.

183. Section 314 of the National Defense Authorization Act for Fiscal Year 2004 (Pub. L. No. 108-136) required the Corps to issue regulations "establishing performance standards and criteria for the use, consistent with §404 of CWA of on-site, off-site, and in-lieu fee mitigation and mitigation banking compensation for §404 permitted lost wetlands functions. The new rule will affect all compensatory mitigation of impacts to jurisdictional waters, not just to wetlands."

184. Gardner, *supra* note 158.

185. A watershed plan

means a plan developed by federal, tribal, state, and/or local government agencies, in consultation with relevant stakeholders. A watershed plan addresses ecological conditions in the watershed, multiple stakeholder interests, and land uses. Watershed plans may also identify priority sites for aquatic resource restoration and protection. Examples of watershed plans include special area management plans, advance identification programs, and watershed management plans.

71 Fed. Reg. at 15535. Note that under "site selection," in proposed §332.3(d) the availability of water rights is to be taken into account with regard to the "size and location of the compensatory mitigation sites relative to hydrologic resources." This progressive point is critical to mitigation success, perhaps especially in the arid western United States, where use rights in water are historically assigned, transferred and certified according to the water appropriation "first in time, first in right" doctrine (as compared with the riparian rights system prevalent in the eastern United States). A western mitigation that does not have highly competed for water rights certified to the project will not likely be sustainable.

177. Statistics are from J. Studt, U.S. Army Corps of Engineers, Washington, D.C. (Jan. 19, 2000), *cited in* MITSCH & GOSSELINK, WETLANDS, *supra* note 7, at 657.

178. NRC COMPENSATING FOR LOSSES, *supra* note 4, at 119. Each of the eight chapters of the NRC Report contains specific recommendations for success that are based upon successful mitigation projects. These recommendations include both ecological and technical considerations, *id.* at 123-68. Mitsch and Gosselink note that three main factors have contributed to mitigation project failure to date: a lack of understanding of wetland function by those engaged in mitigation, too little time for the wetlands to develop, and failure to recognize and use ecological systems' "self-design" tendencies. MITSCH & GOSSELINK, WETLANDS, *supra* note 7, at 684-86.

179. Citing J.A. Reinartz & E.L. Warne, *Development of Vegetation in Small Created Wetlands in Southeast Wisconsin*, 13 WETLANDS 153-54 (1993); see NRC COMPENSATING FOR LOSSES, *supra* note 4, at 130.

180. The evaluation criteria ranged from soils, trees and vegetation cover, to fish and fisheries, marsh invertebrates, and birds. Each category is further broken down to reflect constituent measurements of concern; for example, in the plant and animal measurement categories, such things as biomass, population, and species richness were measured. NRC COMPENSATING FOR LOSSES, *supra* note 4, at 212-14. The summary referred to draws upon over two dozen studies conducted between 1986 and 2000.

181. *Id.* at 130. One wetland scientist observed: "Particular characteristics of projects, such as vegetative cover and production, can resemble those in similar naturally occurring wetlands, when overall functional equivalency has not been demonstrated." M.E. Kentula, *Perspectives on Setting Success Criteria for Wetland Restoration*, 15 ECOLOGICAL ENGINEERING, 199-209 (2000).

the agencies are committed to developing such plans for the many areas that have none, and in particular the areas that are experiencing “significant development pressure.” In areas without a watershed plan, the notice suggests that the permit project sponsors “may” propose compensatory mitigation based on other information, including:

[C]urrent trends in habitat loss or conversion, cumulative impacts of past development activities, current development trends, the presence and needs of sensitive species, site conditions that favor or hinder the success of mitigation projects, chronic environmental problems such as flooding or poor water quality, and local watershed goals and priorities.¹⁸⁶

Such consideration of watershed planning shows much promise for wetland mitigation projects fitting into the landscape. These proactive, national consideration of watershed conditions may even prompt a more accelerated approach to achieving formal watershed plans in the states.

The proposed new rule would include some key definitions. Once formalized, these legal definitions will assist the decentralized Corps district personnel as well as the regulated public in understanding and applying such important terms as functions,¹⁸⁷ services,¹⁸⁸ and values¹⁸⁹ that convey the concepts at the heart of the legal requirements and value judgments inherent in wetland evaluation and subsequent loss compensation. These new definitions should help improve mitigation outcomes by reducing the ambiguity that prior situational or colloquial usage inadvertently perpetuated, thereby promoting more consistent application and interpretation.

Although the CWA itself provides ample clarity on its central goal (we must act affirmatively to maintain and restore the physical, biological, and chemical integrity of the nation’s waters), the §404(b)(1) guidelines¹⁹⁰ and other applicable regulations provide little hard language to guide the agency heads in the onerous and critical public duty of determining what is acceptable or unacceptable, and what is adverse, not adverse, or adverse but to an acceptable extent. The quality of the §404 analyses depends upon the most conscientious interpretation and application of these important terms. Defining them would further the agencies’ ability to achieve success as defined by the Act itself.

Note also that “significant” is not capable of consistent application because it is a subjective descriptor nowhere defined in the regulations. In fact, any attempt to arrive at a practical definition could prove highly problematic. For example, as more information is gleaned about the values and functions contributed by the smallest wetland ecosystems, “significant” could be useless unless it is directly tied to a specific landscape context. Here, future rules could anchor a definition of “significance” in hydrologic terms directly tied to each watershed, to make the determination scientifically and legally defensible.

186. *Id.* at 15523.

187. “Functions mean the physical, chemical, and biological processes that occur in aquatic resources and other ecosystems.” 71 Fed. Reg. at 15525, 15534.

188. “Services means the benefit that human populations receive from functions that occur in aquatic resources and other ecosystems.” *Id.*

189. “Values means the utility or satisfaction that humans derive from aquatic resource services,” either monetary or nonmonetary, and either derived from use or nonuse. *Id.*

Future EPA and Corps proposals for rulemaking should include definitions of additional key terms. This would greatly help to improve outcomes and aid the regulated public. In order to require permit conditions that authentically compensate for impacts to wetlands, the agencies must take great pains to do two main assessments: (1) an assessment of the severity and extent of the damage to the pre-impact wetland; and (2) an assessment to identify the appropriate design and performance standards to authentically compensate for that impact via the mitigation project (these standards become enforceable conditions of the §404 permit). Both assessments must be factually based and well documented enough to be legally defensible as well as meaningful to engineers and biologists in the mitigation community.

The 2006 proposed rule does not yet attempt either a definite or a graduated definition for assessing the severity of an impact on an aquatic resource. The current §404 provisions’ use of vague words and concepts opens the process to widely varying interpretation that hinders effective implementation of the CWA and its regulations. Examples include such subjective terms as “unacceptable” and “adverse.”¹⁹¹

Another persistent example of a phrase that future rules should define is impacts to an aquatic system that “will cause only minimal¹⁹² adverse environmental effects when performed separately, and will have only minimal cumulative adverse effect on the environment,” in §404(e) (regarding general permits).¹⁹³ The law would greatly benefit from a legal, fact-based standard to support the heretofore subjective judgment of a minimal impact. Such a standard also needs a system of taking the impact’s scale into account in an empirical way that is not restricted to the impact at hand. For example, will the impact be minimal because it refers to one-tenth or one-quarter acre? Will it be minimal in its effect on water quality standards for its watershed? Will it minimally affect fauna and flora? Is it minimal with regard to temporal duration and the geoclimatic context of the bio-region? The word minimal cannot continue to be opaque and malleable, if there is to be a meaningful change to no net loss, leading to a net gain of wetlands and wetland functions nationally. The agencies could craft an applicable working

190. The §404(b)(1) guidelines are located at 40 C.F.R. §230.

191. For his or her part, the EPA Administrator possesses the ability to deny use of a disposal site if it would have an “unacceptable adverse effect” on municipal water supplies, shellfish beds and fishery areas (including spawning and breeding areas), wildlife, or recreational areas. Although reasonable minds surely disagree widely on what is “unacceptable” versus what is “acceptable,” there is no formula for determining what is “adverse,” much less for determining what is unacceptably adverse. Before making such a determination, the Administrator must consult with the Secretary. At this point of consultation, at least two knowledgeable officials are presumably engaging in the determination, each from the differing perspectives of their agency’s mission.

192. “The term ‘minimal’ . . . is not quantified . . . [T]he thresholds in the NWP [Nationwide Permit Program] provide some guidance as to what level of impact the Corps considers acceptable, and this threshold has become increasingly lower since the program was first authorized.” NRC COMPENSATING FOR LOSSES, *supra* note 4, at 76.

193. This sentence seems to attempt to convey two ideas that are contradictory when placed together. The separate effects, when considered one at a time, may be minimally adverse. However, it is difficult to imagine that at some point, no matter how far in the future, the “minimally adverse,” “separate” effects will not amount cumulatively to a situation that is more than a “minimal cumulative adverse effect.” Cumulative, by definition, means incrementally adding up, building, or augmenting over time. Such text appears to invite the reader to engage in wishful thinking, or to suspend rational, critical thinking.

definition of minimal in the next sequence of rulemaking with regard to NEPA and the regulations pertaining to wetland loss mitigation.

The 2006 proposed rule would require the project proponent (permit applicant) to submit a statement describing the impacts that his or her project would cause to wetlands. The applicant must also submit a draft mitigation plan in writing, subsequently modified or approved by the Corps,¹⁹⁴ including baseline impact and compensatory information about both sites.¹⁹⁵

The §404(b)(1) guidelines are a logical place to reference new ecological criteria that mitigation measures must achieve. In fact, the current proposal would include new criteria in revisions to the guidelines' subpart H, "Actions to Minimize Adverse Effects." The agencies also propose to establish basic, mandatory ecological performance standards for mitigation projects through a new subpart J, "Compensatory Mitigation for Losses of Aquatic Resources."

The proposed rule considers requiring the permit applicant to post a reasonable bond ensuring satisfactory project completion.¹⁹⁶ Requiring all permittees to post a bond might: (1) promote even-handed application of the law; (2) reduce the incidence of subjective judgment that could engage the Corps in adversarial relations; (3) encourage all applicants to follow through on delivery of their permit conditions; and (4) in some small set of circumstances, the bond might be a further disincentive to develop properties where wetlands exist. Bonds would generate funding for wetland preservation and restoration if mitigation fails, including wetland purchase for mitigation banks. Unless the bonds were exorbitant, courts might accept such an across-the-board financial commitment as reasonable, and not an unfair or undue burden that interferes with a landowner's property use options.

The new rule would still rely mainly on wetland acreage¹⁹⁷ as the basis for determining function, perhaps because of the expense and staff time required for conducting actual field functional assessments.¹⁹⁸ A pragmatic and hon-

est choice by an agency under pressure to process thousands of permit applications per year, this reliance on acreage is probably not going to change anytime soon. There is no indication that the Corps and EPA budgets have been substantially increased to improve the §404 program with more field staff and associated resources. However, provisions have also been made in the proposed rule to expand monitoring and to plan for post-project management.¹⁹⁹ Finally, "to the maximum extent practicable," the proposed rule would require mitigation to be performed in advance of the wetland impact.²⁰⁰ Mitigation projects would be required to meet performance standards.²⁰¹ Moreover, permit applicants would have to provide financial assurances until the Corps is satisfied that the project is a success. The 2006 proposed rule shows promise toward mitigation law that is more informed by the past 30 years of wetland scientific knowledge.

IV. The Status of Mitigation Improvement; Considerations for the Next Era in Compensatory Mitigation

Many of the changes embodied in the guidance documents and other Corps statements since 2001 reflect careful attention to the NRC Report. However, the process of markedly improving compensatory mitigation is an ongoing objective with slow progress that requires patience. As late as September 2005, four years after the NRC issued its groundbreaking volume critiquing mitigation under the CWA, the U.S. Government Accountability Office released a report finding that the Corps' oversight of wetland mitigation, particularly with regard to monitoring and enforcement of permit conditions, needs improvement.²⁰²

We take for granted the ability to mitigate the loss of wetland functions and values. This assumption is at the heart of the requirements outlined in the CWA §404 guidelines and provides the legal and equitable justifications for wetland loss mitigation. The assumption rests upon our confidence that we have the ability to accurately identify and record existing functions and values through a scientific assessment,

choice of words speaks volumes. The Corps did not choose words to convey that functional assessment is too scientifically uncertain, ostensibly because that is no longer the case, as perhaps many observers would have claimed even a decade ago. The two statements taken together preserve HGM assessment (the hydrogeomorphic approach, or HGM) as the Corps' preferred approach to wetland function while allowing the agency to maintain broad discretion. Since 1997, the Corps has devoted much effort to develop and disseminate instructions for the consistent application of HGM to the districts across the country, an effort redoubled in response to the NRC's recommendation of HGM as a sound method of functional assessment, an endorsement by the NRC of a method the Corps itself developed. See Notice: The National Plan to Implement the Hydrogeomorphic Approach to Assessing Wetland Functions, 62 Fed. Reg. 33607 (June 20, 1997), available at <http://www.usace.army.mil/inet/functions/cw/cecwo/reg/hydrogeo.htm> (last visited Dec. 17, 2006). See also *The Hydrogeomorphic Approach for Assessing Wetland Functions*, <http://el.erc.usace.army.mil/wetlands/hgmhp.html> (last visited Dec 17, 2006).

194. 71 Fed. Reg. at 15538.

195. *Id.* During the baseline determinations, field testing for functions could also be performed.

196. The agencies' current proposed rulemaking announces a new requirement for permittees to provide financial assurances. *Id.* at 15519.

197. *Id.* at 15526.

198. The Corps' commitment to retaining wetland function as the basis for the mitigation replacement ratio continues to be confusing and unclear. The law requires functions of the lost wetland to be accounted for factually and replaced by the new wetland. Quantifying acreage (instead of function) is only used as a surrogate unit for replacement when wetland function is uncertain. Unfortunately, this fallback position is an incentive to avoid the time and financial burdens of empirical scientific measurements to determine the presence and extent of wetland values and functions (but, as stated, the use of acreage as the basis for determining function is retained in the 2006 proposed rule). The Corps has been struggling with this for the past several years. The Corps stated (in a 2002 Federal Notice) that it does use function as the basis, "but since models to assess aquatic ecosystem functions, including but not limited to wetlands, are not yet comprehensive, the decision requires professional judgment." 67 Fed. Reg. at 2065. The Corps further stated in January 2002 that "[t]he Corps makes its mitigation decisions on an aquatic ecological function basis using professional judgment. With thousands of decisions each year, many involving less than 0.1 acre of impact, it is not practical, nor a responsible expenditure of resources to require absolute proof that the mitigation will offset the impacts." These two statements seem reasonable on the surface. However, notice, in the first statement, that the Corps used the word "comprehensive." This

199. 71 Fed. Reg. at 15540.

200. *Id.* at 15538.

201. *Id.* at 15545, 15550.

202. Government Accountability Office, *Wetlands Protection: Corps of Engineers Does Not Have an Effective Oversight Approach to Ensure That Compensatory Mitigation Is Occurring*, <http://www.gpoaccess.gov/gaoreports/> (last visited Jan. 9, 2007) (enter "mitigation" as a search term to get a copy of the report).

and the ability to duplicate the functions and values based on that assessment through reliable, replicable design and performance standards.

Design standards are extremely specific guidelines for site examination and selection and subsequently include construction or procedural criteria that go into a written mitigation plan. Design criteria are benchmarks that are proactive, sequential, and thought through before crews ever break ground or commence construction work. Performance standards represent the measurable outcomes, over a delineated time period, of the mitigation project's written plan; performance standards are also known as benchmarks of performance.²⁰³

Design and performance standards are the main ingredients of §404 permit conditions; they are step-by-step goals for mitigating wetland losses.²⁰⁴ Until EPA commissioned the Environmental Law Institute (ELI) to perform such a review, no one had undertaken a comprehensive review of the literature to assess the status of wetland science in order to distill meaningful performance standards. The ELI review examined hundreds of studies on hydrogeomorphology, fauna, flora, soil, and other metric parameters between natural and compensatory mitigation wetlands. The study, "Measuring Mitigation: A Review of the Science for Compensatory Mitigation Performance Standards," cautiously indicates that regulators could develop and implement a set of performance standards based on existing literature. The 2004 review is persuasive that implementing the new standards on the ground could successfully achieve compliance while working in highly variable site circumstances.

The 2006 proposed rule raises the bar on acceptable mitigation techniques and approaches, similar to older technology-forcing structures in environmental law. Future rules should continue to aim to improve mitigation standards. For instance, the agencies could revise 33 C.F.R. §330.1(e)(3) to mandate specific, consistent mitigation standards according to certain preconditions. For example, a certain higher level of avoidance under NEPA, followed by mandating the most stringent mitigation techniques, could be mandated to be employed for the loss of wetland habitats that are classified as rare or endangered, wetlands whose hydrology is paramount to the water quality or flood attenuation needs of the local watershed, and/or wetlands that are of high habitat value.

Moreover, directly tying the issuance of nationwide permits to the applicable state's water quality certification program as indicated in 33 C.F.R. §330.4(c) has vast implications for wetland protection, watershed management (including transboundary watersheds), and emerging trends. Sophisticated simulation models could be developed into which real hydrogeomorphic and other metric data could be entered from the wetland slated to be filled, including soil, slope, vegetation, climate, and so forth. Through these models, predicted changes in water quality could be compared.

Currently, the guidelines prohibit discharges that violate a state's water quality standards.²⁰⁵ Future revised regulations could require that mitigation project proponents demonstrate that all applicable water quality standards²⁰⁶ will be met by the final project, once it has become established, with a time frame of benchmarks. The question of water quality standards and certification (pre-loss and post-mitigation) is filled with potential; we need to investigate all aspects of this potential, primarily to derive measurable and enforceable mitigation standards, as we continue to pursue the national project of improving wetland mitigation tech-

205. 40 C.F.R. §230.10(b)(1) states:

No discharge of dredged or fill material shall be permitted if it: (1) causes or contributes, after consideration of disposal site dilution and dispersion, to violations of any applicable State water quality standard; (2) violates any applicable toxic effluent standard or prohibition under Section 307 of the Act; or (3) jeopardizes the continued existence of species listed as endangered or threatened under the Endangered Species Act of 1973.

206. Recall that under 33 C.F.R. §325.2(b), the Corps has the authority to ask for water quality certification with regard to anticipated permitted activities if the Corps thinks water quality is implicated by the project. At the end of 2005, EPA issued a guidance on water quality standards for wetlands. The new guidance states that its objective is "to assist States in applying their water quality standards regulations to wetlands in accordance with the Agency Operating Guidance, which states:

By September 30, 1993, States and qualified Indian Tribes must adopt narrative water quality standards that apply directly to wetlands. Those Standards shall be established in accordance with either the National Guidance, Water Quality Standards for Wetlands . . . or some other scientifically valid method. In adopting water quality standards for wetlands, States and qualified Indian Tribes, at a minimum, shall: (1) define wetlands as "State waters"; (2) designate uses that protect the structure and function of wetlands; (3) adopt aesthetic narrative criteria (the "free froms") and appropriate numeric criteria in the standards to protect the designated uses; (4) adopt narrative biological criteria in the standards; and (5) extend the antidegradation policy and implementation methods to wetlands. Unless results of a use attainability analysis show that the section 101(a) goals cannot be achieved, States and qualified Indian Tribes shall designate uses for wetlands that provide for the protection of fish, shellfish, wildlife, and recreation. When extending the antidegradation policy and implementation methods to wetlands, consideration should be given to designating critical wetlands as Outstanding National Resource Waters. As necessary, the antidegradation policy should be revised to reflect the unique characteristics of wetlands. This level of achievement is based upon existing science and information, and therefore can be completed within the FY 91-93 triennial review cycle. Initial development of water quality standards for wetlands over the next three years will provide the foundation for the development of more detailed water quality standards for wetlands in the future based on further research and policy development (see Section 7.0.). Activities defined in this guidance are referred to as Phase 1 activities, while those to be developed over the longer term are referred to as Phase 2 activities. Developing water quality standards is an iterative process. This guidance is not regulatory nor is it designed to dictate specific approaches needed in state water quality standards. The document addresses the minimum requirements set out in the Operating Guidance, and should be used as a guide to the modifications that may be needed in state standards. EPA recognizes that state water quality standards regulations vary greatly from state to state as do wetland resources. This guidance suggests approaches states may wish to use and allows for state flexibility and innovation.

National Guidance: Water Quality Standards for Wetlands, <http://www.epa.gov/owow/wetlands/regs/quality.html> (last visited Dec. 17, 2006).

203. NRC COMPENSATING FOR LOSSES, *supra* note 4, at 15; *see also* MITSCH & GOSSELINK, WETLANDS, *supra* note 7, at 653-86.

204. The Corps has stated that "performance standards" (or success criteria, success standards, or release criteria) are "observable or measurable attributes that can be used to determine if a compensatory mitigation project meets its objectives." This definition, in a 1999 report titled "Examples of Performance Standards for Wetland Creation and Restoration in §404 RS-3.3," and is also located in Appendix E to NRC COMPENSATING FOR LOSSES, *supra* note 4, at 219.

niques and sustainable gains. However, legal strategies must co-evolve with political and social strategies.

Professor Gardner has written that mitigation success has more to do with human and economic factors than with §404 or other regulatory structures.²⁰⁷ Although there is a good deal of truth in his assertion, the law could be far more effective than it is; §404 could become a driving force behind increasingly successful mitigation of wetland losses. The law could contribute to the use of compensatory mitigation as only a last resort, which would greatly decrease the quantity of wetlands removed from the landscape. Mitigation would then, by law, employ state-of-the-art restoration, and be available in limited circumstances involving only the wetland types proven to be most capable of mitigation. Some wetlands and wetland types would simply be off-limits. What more than law—well drawn and consistently enforced—could narrow the range of human and economic excuse mechanisms involved up to now, while the slow pace of research, social education, and progress proceeds?

We need not wonder what the limits of law are, because we have not yet tested them, despite Professor Gardner's observation noted above. This is particularly true at mitigation's weakest links: at the pre-impact and post-permit stages of the regulatory process. Until 2001, when the NRC Committee brought its own field observations and reviews of contemporary research to public light, the weaknesses inherent in conventional mitigation design and performance and permit monitoring and enforcement mechanisms had been ongoing for decades and largely ignored, although mitigation project failures became increasingly visible on the ground.²⁰⁸

The problems that concern the CWA's ability to stem wetland loss are not, of course, quantity of law, but quality and execution.²⁰⁹ In recognition of this reality, the new rules proposed in March 2006 regarding wetland compensatory mitigation will address how we could make the CWA more focused on achieving not only no net loss, but a measurable gain in thriving wetlands.

By way of some final observations, a group dedicated to the task of revision, such as the interagency task force, should read and interpret the statutory provisions of the CWA holistically, cross-referencing them with each set of the pertinent regulations in order to clarify or eliminate po-

tential discrepancies or contradictions. For example, there is a sentence within the Corps' general regulations that positively recognizes and expresses that "piecemeal changes can result in a major impairment of wetland resources."²¹⁰ Yet, the statute contemplates separate, discrete actions that "will cause only minimal adverse environmental effects when performed separately, and will have only minimal cumulative adverse effect on the environment," in §404(e) regarding general permits. The sentence appears to contradict the possibility for separate or piecemeal impacts to create major impairment.²¹¹ Common sense tells us otherwise. If the terrain were unitary (joinable, separable, and capable of being rearranged as Lego blocks, for example) and not existing in complex, multiprocess integrity (more like a living body) this might not be so problematic. Economics and engineering might use unitary modeling for analysis; biology and ecology have necessarily grown beyond discreet conceptual units to embrace holistic observation and modeling of systems that are interdependent and nonstatic. Perhaps the present panoply of fragmented regulations is itself emblematic of the need to leave behind unitary thinking. A systematic, thoughtful review of the regulatory subject matter, textual relationships, and overlapping effect of the family of CWA regulations is in order.²¹²

After we have fully exhausted conscientious applications of law and data, we can expand the circle of considerations to the economic and the social. The scope cannot go the other way, as it has been going, or we will achieve the same results, at ever-increasing public and private costs: (1) degraded watersheds that produce water so polluted that it does not meet even minimum standards²¹³; (2) catastrophic flooding, drought, and fires; (3) individual species decline adding to overall loss of biodiversity; and (4) water shortages affecting public water supplies, agriculture, and the ecosystem's own requirements.

V. Conclusion

It is time to "get real" in planning for an authentic, honest, and increasingly significant net gain of wetland values, if only out of national pragmatism for the sustainability of the waters of the United States and the nation's water security.²¹⁴ The FWS is aiming at ways to restore 100,000 acres each year, a laudable goal that will have the dubious distinction of equally balancing out losses if current estimates are correct.

207. Royal C. Gardner, *Banking on Entrepreneurs: Wetlands, Mitigation Banking, and Takings*, 81 IOWA L. REV. 527, 541 (1996).

208. As stated, the 2001 NRC Report found compensatory wetlands were far more likely to be open-water wetlands, regardless of the type of wetland that was impacted. As remarked earlier, this difference matters with respect to the biodiversity, productivity, and functionality of the wetland within its watershed setting; even a seemingly small difference (such as 5%) in saturation, length or intensity of hydroperiod, can have an enormous effect on plants and animals because "landscape setting is a critical consideration when planning and constructing a [created] wetland mitigation project," with regard to existing hydrology and factors in siting which contribute to success. See NRC COMPENSATING FOR LOSSES, *supra* note 4, at 46. Achieving parity between the wetland functions taken and the functions replaced could be remedied at the beginning stages (identifying appropriate with design and performance strategies) and the end stages through regular monitoring during both the construction of the project and at regular intervals after the permit expires.

209. While wetland science gradually progresses to support the reduction of wetland loss through improving mitigation practices, in fact, the universe of explanations of wetland loss also includes forces beyond the CWA, but nonetheless crucial to bear in mind: expanding human population, weak or ineffective zoning, public ignorance and will, and escalating land prices.

210. 33 C.F.R. §320.4(b)(3) and 40 C.F.R. ch. I, §230.12(g)(1); see also MITSCH & GOSSELINK, *WETLANDS*, *supra* note 7, at 127.

211. Here is a definite example of where the specific wetland and its watershed would dictate the proper outcome.

212. The Corps is working on gathering postmitigation project data and generating reports on "cumulative losses" for nationwide permits, which should help support a "watershed approach." This will help overcome the scale problem: that wetland decisions are made discretely, at the local level. As we continue to absorb and value the "big picture," perhaps widely accessible national data will become standard, even indispensable, at some future point. 67 Fed. Reg. at 2068.

213. The national goal of water quality that "provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water," the minimum standard that all waters must be "fishable and swimmable," located in 33 U.S.C.A. 101(a)(2).

214. See *supra* note 167, regarding the tendency to replace high-functioning wetlands with ponds.

What it takes to succeed in a net-gain era is a greater commitment to abide by what we already know works. While avoidance of further wetland destruction is paramount, the use of wetland mitigation to offset wetland losses is here to stay. Meanwhile, the use of compensatory wetland mitigation and the creation of wetlands specifically for water treatment via bioremediation are likely to expand. While we have progressed in our scientific and technical knowledge to ascertain proven design and performance standards for mitigation, further research must become a top national priority.

We are managing across geographical, ecological, institutional, and even temporal boundaries, while becoming more attuned and attentive to the landscape and our actions upon it more closely than before, from the micro through the macro scales. The CWA's §404 and relevant regulations governing our management decisions must be brought up to date from their 30-year-old context to reflect new environmental knowledge and new stewardship paradigms, and the

March 2006 proposed rulemaking is a significant effort toward this end. We are increasingly learning to what extent the land, water, and atmospheric systems on earth are connected. However, this approach is not without challenges.

Prof. A. Dan Tarlock cautions: "There can never be a final decision in science-based management," but the law, through the doctrine of *res gestae* and principles of equity, demands finality.²¹⁵ Science, process, and the contemporary acknowledgement of ecosystem and human interdependence must not lead to endless negotiation or deferred planning. We must think in more sophisticated ways about process while acting affirmatively and decisively in the best interests of watersheds. This, in turn, will serve the best interests of the nation.

215. A. Dan Tarlock, *The Non-Equilibrium Paradigm in Ecology and the Partial Unraveling of Environmental Law*, 27 *LOY. L.A. L. REV.* 1139, 1144 (1994).