

MITIGATION REGULATION ARTICLES

COMPENSATING FOR WETLAND LOSSES UNDER THE CLEAN WATER ACT (REDUX): EVALUATING THE FEDERAL COMPENSATORY MITIGATION REGULATION*

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The goal of no net loss of wetlands is not being met for wetland functions by the mitigation program, despite progress in the last 20 years.

—National Research Council, Committee on Mitigating Wetland Losses (2001)¹

[I]n 2001 the National Research Council (NRC) released a comprehensive evaluation of the effectiveness of wetlands compensatory mitigation required under section 404 of the Clean Water Act. This report noted concerns with some past wetland compensatory mitigation and provided recommendations for the federal agencies, states, and other parties to improve compensatory mitigation. This report was an important resource in the development of today's rule.

—U.S. Army Corps of Engineers and U.S. Environmental Protection Agency (2008)²

As former members of the NRC Committee on Mitigating Wetland Losses, we were encouraged to see that the federal agencies seriously considered our report and issued a regulation in April 2008 that seeks to implement our recommendations.³ This Article offers our thoughts on the new regulation in light of our report, as well as patterns and rates of wetland loss since 2001. After providing a brief background on the Clean Water Act and the NRC report, we examine the extent to which the new regulation incorporates several of our primary recommendations. In particular, we consider whether and how the regulation addresses our recommendations concerning the watershed approach; operational guidelines and performance standards; and the treatment

1. Natl. Research Council, *Compensating for Wetland Losses under the Clean Water Act 2* (Natl. Acad. Press 2001).

2. 73 Fed. Reg. 19594, 19595 (Apr. 10, 2008).

3. 33 C.F.R. § 332 (2008); 40 C.F.R. § 230 (2008). In contrast, most of the recommendations of the NRC Committee on Characterization of Wetlands contained in *Wetlands: Characteristics and Boundaries* were not adopted by federal agencies. Carol A. Johnston, *Revisiting the 1995 NAS Characterization Report* (Annual Meeting of the Society of Wetland Scientists, Washington D.C., May 28, 2008) (referencing Natl. Research Council Comm. on Characterization of Wetlands, *Wetlands: Characteristics and Boundaries* (Natl. Acad. Press 1995)).

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of mitigation banks, in-lieu fee programs, and permittee-responsible mitigation. While the new regulation represents significant progress, its effectiveness (or lack thereof) will depend on implementation in the field. Will the agencies have sufficient resources and the institutional will to assess adequately proposed plans and ensure compliance? As the agencies proceed, we urge them to renew an emphasis on avoidance of wetland impacts.⁴ We also urge them to apply adaptive management principles to the new rule: evaluate and adjust in light of experience.

I. THE CLEAN WATER ACT SECTION 404 PROGRAM AND THE NRC CONCLUSIONS AND RECOMMENDATIONS

The Clean Water Act is the federal government's primary regulatory mechanism to protect wetlands.⁵ Before proceeding with a project that could damage a wetland, a property owner typically must obtain a Section 404 permit from the U.S. Army Corps of Engineers (Corps).⁶ As a condition of the permit, the Corps often requires the permittee, after it has tried to avoid and minimize the project's adverse impact on the wetland, to provide "compensatory mitigation" to offset any remaining wetland impacts.⁷ The compensatory mitigation may involve restoring a pre-

4. See Susan Marie Stedman & Thomas E. Dahl, *Coastal Wetlands of the Eastern United States: 1998–2004 Status and Trends*, 30 Natl. Wetlands Newsltr. 18, 19–20 (July–Aug. 2008) (finding "an average annual net loss of 59,000 acres [of coastal wetlands] over the six-year study period").

5. Clean Water Act, 33 U.S.C. §§ 1251–1387 (2000).

6. *Id.* at § 1344. While the Clean Water Act grants the Corps the authority to issue Section 404 permits, the EPA has a significant role in administering the program. 40 C.F.R. § 230 (2007). In making permit decisions, the Corps must apply EPA-promulgated regulations, the so-called Section 404(b)(1) guidelines. *Id.* The two agencies also share enforcement authority. Robert W. Page & Rebecca W. Hammer, *Memorandum of Agreement between the Department of the Army and the Environmental Protection Agency Concerning Federal Enforcement for the Section 404 Program of the Clean Water Act* pt. I (Jan. 18, 1989) (available at <http://www.usace.army.mil/cw/cecwo/reg/mou/enfmoa.htm>). The EPA can also veto a Corps permit. 33 U.S.C. § 1344(c) (2000); 73 Fed. Reg. 54398 (Sept. 19, 2008) (EPA veto of proposed Yazoo Backwater Area Pumps Project, which would have adversely affected 67,000 acres of wetlands). Oliver Houck once famously described the Section 404 program as having been "constructed on the backs of two beasts moving in different directions." Oliver A. Houck, *Hard Choices*, 60 U. Colo. L. Rev. 773, 774–775 (1989).

7. Royal C. Gardner, *Mitigation*, in *Wetlands Law and Policy: Understanding Section 404* at 253 (Kim Diana Connolly, Stephen M. Johnson & Douglas R. Williams eds., ABA 2005).

viously existing wetland, enhancing the functions of an existing wetland, creating a wetland where one did not previously exist, preserving an existing wetland, or some combination thereof.⁸ In theory, compensatory mitigation ensures “no net loss” of wetland functions.⁹ In practice, compensatory mitigation has been problematic.¹⁰

In 1999, the U.S. Environmental Protection Agency (EPA) requested that the NRC examine the effectiveness of compensatory mitigation under the Clean Water Act.¹¹ The NRC convened a multidisciplinary committee to evaluate the extent to which compensatory mitigation was contributing to the goal of no net loss of wetlands.¹² The committee reviewed the scientific and policy literature on compensatory mitigation, visited mitigation sites, and held a series of five meetings throughout the country.¹³ In 2001, the committee issued its report, entitled *Compensating for Wetland Losses under the Clean Water Act*.¹⁴ The committee’s first principal finding, as noted above, was that the Clean Water Act compensatory mitigation program was not achieving no net loss.¹⁵

The committee observed that wetland compensatory mitigation projects failed at various stages.¹⁶ Sometimes the permittee would not even attempt to perform the required compensatory mitigation.¹⁷ Sometimes the permittee would try but was unable to meet performance standards.¹⁸ Other times the permittee was

8. *Id.* at 258. The regulation divides restoration into the following two categories: re-establishment and rehabilitation. *Id.* Re-establishment involves restoring a site that was once but is no longer considered a wetland. Thus re-establishment “results in a gain in aquatic resource area and functions.” 33 C.F.R. § 332.2; 40 C.F.R. § 230.92. Rehabilitation involves manipulating a degraded wetland, and accordingly “results in a gain in aquatic resource function, but does not result in a gain of aquatic resource area.” *Id.* Creation is now referred to as “establishment.”

9. Gardner, *supra* n. 7, at 261–262. For a comprehensive history of the “no net loss” policy, see Palmer Hough & Morgan Robertson, *Mitigation under Section 404 of the Clean Water Act: Where It Comes From, What It Means*, 17 *Wetlands Ecology & Mgt.* 15 (2009).

10. See William J. Mitsch & James G. Gosselink, *Wetlands* ch. 12 (4th ed., John Wiley & Sons 2007) (summarizing several regional reviews of mitigation effectiveness).

11. Natl. Research Council, *supra* n. 1, at xv.

12. *Id.*

13. *Id.*

14. See generally *id.* (referencing the entire report).

15. *Id.* at 122.

16. See *id.* at 94–121 (explaining the different stages of mitigation and the failures and shortcomings of each stage).

17. *Id.* at 101.

18. *Id.* at 103.

able to satisfy the performance standards (legal compliance), but the resulting wetland did not provide the desired functions (ecological or functional performance).¹⁹ Even if a compensatory mitigation project was initially ecologically functional, permittees rarely were required to have long-term stewardship plans and obligations.²⁰ Although during the time period from 1993–2000 the Corps was requiring permittees to provide an average of 1.8 acres in mitigation for every acre of wetland filled, studies demonstrated that these were only paper gains.²¹ Net loss of wetland ecosystem functions was occurring on the ground, but the magnitude of the loss was unknown.²²

The committee made several other conclusions, which included the following:

- A watershed approach would improve permit decision-making.²³
- Performance expectations in Section 404 permits have often been unclear, and compliance has often not been assured nor attained.²⁴
- Support for regulatory decisionmaking is inadequate.²⁵
- Third-party compensation approaches (mitigation banks, in-lieu fee programs) offer some advantages over permittee-responsible mitigation.²⁶

19. *Id.*

20. *Id.* at 110–111.

21. *Id.* at 3.

22. *Id.* Although the committee did not quantify the magnitude of the loss, several members did so in a follow-up article, estimating that the Section 404 program “has been fostering an 80 percent net loss of wetlands.” R. Eugene Turner, Ann M. Redmond & Joy B. Zedler, *Count It by Acre or Function—Mitigation Adds Up to Net Loss of Wetlands*, 23 *Natl. Wetlands Newsltr.* 5, 15 (Nov.–Dec. 2001).

23. *Natl. Research Council, supra* n. 1, at 3.

24. *Id.* at 6.

25. *Id.* at 8.

26. *Id.* at 9. Under a third-party compensation approach, the legal responsibility for the mitigation shifts from the permittee to another party, either a mitigation banker or in-lieu fee administrator. *Id.* At the time, a “mitigation bank” was defined as “a site where wetlands and/or other aquatic resources are restored, created, enhanced, or in exceptional circumstances, preserved expressly for the purpose of providing compensatory mitigation in advance of authorized impacts to similar resources. For purposes of Section 10/404, use of a mitigation bank may only be authorized when impacts are unavoidable.” 60 *Fed. Reg.* 58605, 58614 (Nov. 28, 1995). An “in-lieu fee program” was defined as a circumstance

The committee also produced a suite of recommendations designed to increase the effectiveness of compensatory mitigation, which included the following:

- Site selection for wetland conservation and mitigation should be conducted on a watershed scale in order to maintain wetland diversity, connectivity, and appropriate proportions of upland and wetland systems needed to enhance the long-term stability of the wetland and riparian systems. Regional watershed evaluation would greatly enhance the protection of wetlands and/or the creation of wetland corridors that mimic natural distributions of wetlands in the landscape.²⁷
- Avoidance is strongly recommended for wetlands that are difficult or impossible to restore, such as fens or bogs.²⁸
- Compensatory mitigation should be in place concurrent with, and preferably before, permitted activity.²⁹
- Mitigation goals must be clear, and those goals [must be] carefully specified in terms of measurable performance standards, in order to improve mitigation effectiveness.³⁰
- To ensure the replacement of lost wetland functions, there should be effective legal and financial assurances for long-term site sustainability and monitoring of all compensatory wetland projects.³¹
- Compensatory mitigation sites should receive long-term stewardship, i.e., a time frame expected for other publicly valued assets, such as parks.³²
- [W]hen an agency reviews mitigation options, it is most important to focus on their characteristics or attributes

“where a permittee provides funds to an in-lieu-fee sponsor instead of either completing project-specific mitigation or purchasing credits from a mitigation bank approved under the Banking Guidance.” 65 Fed. Reg. 66914, 66914 (Nov. 7, 2000).

27. Natl. Research Council, *supra* n. 1, at 4.

28. *Id.*

29. *Id.* at 7.

30. *Id.*

31. *Id.*

32. *Id.* at 8.

(e.g., who is legally responsible, the timing of the mitigation actions, whether the Mitigation Banking Review Team process is used, and whether stewardship requirements are in place).³³

Subsequent reports and studies have confirmed the shortfalls associated with the Clean Water Act Section 404 compensatory mitigation program.³⁴ The Environmental Law Institute observed that some mitigation bank agreements allowed for a large percentage of early release of credits (i.e., credits that could be sold prior to meeting ecological performance standards),³⁵ and that agency tracking and accounting of in-lieu fee programs were poor.³⁶ A follow-up study on in-lieu fee programs found similar problems.³⁷ Meanwhile, permittee-responsible mitigation remained the primary source of compensatory mitigation,³⁸ and it continued to fail to provide functional replacement for filled wetlands.³⁹ In 2005, the General Accountability Office found that the Corps failed to exercise proper oversight of compensatory mitigation sites.⁴⁰

33. *Id.* at 9.

34. *Infra* nn. 35–40 and accompanying text (discussing different reports and studies identifying and categorizing the problems with Section 404's compensatory mitigation program).

35. Env'tl. L. Inst., *Banks and Fees: The Status of Off-Site Wetland Mitigation in the United States* 63 (Env'tl. L. Inst. Sept. 2002) (available at http://www.elistore.org/reports_detail.asp?ID=10695) [hereinafter Env'tl. L. Inst., *Banks and Fees*]. Other commentators reported on how mitigation banking facilitated the migration of wetlands from urban to rural areas. J.B. Ruhl & James Salzman, *The Effects of Wetland Mitigation Banking on People*, 28 Nat'l. Wetlands Newsltr. 1, 9–14 (Mar.–Apr. 2006).

36. Env'tl. L. Inst., *Banks and Fees*, *supra* n. 35, at 101–102.

37. See Env'tl. L. Inst., *The Status and Character of In-Lieu Fee Mitigation in the United States* (Env'tl. L. Inst. June 2006) (available at http://www.epa.gov/owow/wetlands/pdf/ELI_ILF_Study06.pdf) (reporting on the active in-lieu fee programs in the country and assessing the degree to which the programs have responded to concerns and recommendations).

38. Jessica Wilkinson & Jared Thompson, *2005 Status Report on Compensatory Mitigation in the United States* 27 (Env'tl. L. Inst. Apr. 2006) (available at <http://www.epa.gov/owow/wetlands/pdf/ELIMitigation2005.pdf>).

39. See Nat'l. Wetlands Mitigation Action Plan, *Recent Evaluations of Compensatory Mitigation*, <http://www.mitigationactionplan.gov/recentevals.html> (last updated Oct. 30, 2007) (providing links to evaluations).

40. U.S. Gen. Acctg. Off., *Wetlands Protection: Corps of Engineers Does Not Have an Effective Oversight Approach to Ensure that Compensatory Mitigation Is Occurring* 17 (GAO-05-898, Sept. 2005) (available at <http://www.gao.gov/new.items/d05898.pdf>).

In light of these criticisms, the Corps and the EPA, along with other agencies, embarked on a National Wetlands Mitigation Action Plan.⁴¹ This Plan sought to implement the recommendations of the NRC and others, largely through guidance documents.⁴² Much of the work of this Plan was supplanted by a congressional directive in 2003 that called on the Corps to issue a regulation to establish “equivalent standards and criteria to each type of compensatory mitigation.”⁴³ The Corps and the EPA published a proposed regulation for public comment in March 2006,⁴⁴ which in the agencies’ view would codify many NRC recommendations. After considering approximately 850 distinct comments, the agencies promulgated the final rule in April 2008.⁴⁵

During the course of the rulemaking, the U.S. Fish and Wildlife Service (FWS) issued *Status and Trends of Wetlands in the Conterminous United States 1998 to 2004*.⁴⁶ Although the FWS reported a net gain in wetland area, the report was careful to note that there was not necessarily a net gain in wetland functions.⁴⁷ Indeed, it emphasized that “[t]his study reports on changes in wetland acreage and does not provide an assessment of wetland functions or quality.”⁴⁸ The continuing uncertainty over net loss of wetland functions highlights the importance of the new compensatory mitigation regulation.

41. Dept. of the Army, U.S. Env'tl. Protec. Agency, U.S. Dept. of Commerce, Dept. of Interior, U.S. Dept. of Agric., and U.S. Dept. of Transp., *National Wetlands Mitigation Action Plan*, <http://www.mitigationactionplan.gov/map1226withsign.pdf> (Dec. 24, 2002).

42. *Id.* at 2.

43. 10 U.S.C. § 2694(b) (2006).

44. 71 Fed. Reg. 15520, 15520 (proposed Mar. 28, 2006).

45. 73 Fed. Reg. at 19595. In addition to the distinct comments, the agencies received another 11,150 emails or letters that were “substantially identical.” *Id.*

46. Thomas E. Dahl, *Status and Trends of Wetlands in the Conterminous United States 1998 to 2004* (U.S. Fish and Wildlife Serv. 2006).

47. *Id.* at 16. Much of the gain in acreage, however, was due to an increase in open ponds, which are considered wetlands under the FWS methodology. *Id.* at 17. If the nearly 700,000 acres of ponds were not counted, “wetland gains would not have surpassed wetland losses during the timeframe of this study.” *Id.* The report observes that these new ponds “would not be expected to provide the same range of wetland values and functions as a vegetated freshwater wetland.” *Id.*

48. *Id.* at 16. The EPA is embarking on an effort to assess the wetland functions nationally. Michael E. Scozzafava, Tom Dahl, Chris Faulkner & Myra Rice, *Assessing Status, Trends, and Condition of Wetlands in the United States*, 29 Natl. Wetlands Newsltr. 24 (May–June 2007).

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II. TO WHAT EXTENT DOES THE NEW MITIGATION REGULATION IMPLEMENT THE PRIMARY NRC RECOMMENDATIONS?

In this Section, we examine the mitigation regulation in the following three principal areas covered by our report recommendations: the watershed approach; operational guidelines and performance standards; and mitigation mechanisms (requirements imposed on mitigation banks, in-lieu fee programs, and permittee-responsible mitigation).

A. The Watershed Approach

Like the concept of no net loss of functions, the watershed approach is easier to articulate than implement. After a brief introduction to the watershed approach in concept and practice, we discuss how the mitigation regulation addresses the issue. We also consider how the regulation deals with sequencing and difficult-to-replace wetlands in a watershed context.

1. *Watershed Basics*

The watershed approach begins by recognizing the importance of a watershed perspective.⁴⁹ As detailed in the NRC report, many of the ecosystem services that are provided by wetlands depend on the wetland's hydrogeomorphic setting in the watershed and other landscape-scale characteristics.⁵⁰ For a particular wetland site, the upstream portions of the watershed determine the water quality improvement potential (which is a function of both the quantity and quality of inflowing water) and its flood abatement potential (which depends on the timing and volume of inflowing water) at the wetland site and downstream.⁵¹ Biodiversity support depends in part on the number, type, size, and connectivity of other wetlands and open spaces in the entire watershed and the position of the site in the watershed.⁵² A mitigation site

49. See Natl. Research Council, *supra* n. 1, at 46–59.

50. *Id.*

51. *Id.* at 48–49.

52. Joy B. Zedler, *Wetlands at Your Service: Reducing Impacts of Agriculture at the Watershed Scale*, 1 *Frontiers in Ecology & Env.* 65, 69 (Mar. 2003).

isolated from other wetlands and riparian zones in a heavily developed watershed (urban or agricultural) will function quite differently from one located in a mostly natural watershed, such as the Nature Conservancy's Mukwonago River Watershed in southeastern Wisconsin, where large blocks of land have been acquired and protected, with ongoing restoration to sustain biodiversity underway.⁵³ Note, however, that in some cases there is more wetland value when a wetland is located in areas of mid-range human population, given that such "values" often require humans to be near to benefit from the functions.

Brad Johnson, author of *Hydrogeomorphic Wetland Profiling: An Approach to Landscape and Cumulative Impacts Analyses*, provides a good example of the background information and impact analyses necessary for a watershed approach.⁵⁴ First, he characterized three types of ecoregions within Summit County (central Colorado) as low lands, middle elevation transitional lands, and high mountains.⁵⁵ Next, he showed that wetland impacts disproportionately occurred in the lowland ecoregion.⁵⁶ Wetland types differed by ecoregion; for example, riverine wetlands were extensive in the low lands, depressional wetlands had their highest coverage in the middle elevation transitional ecoregion, and slope wetlands peaked at 80% cover in the high mountains.⁵⁷ Lastly, because wetland types were differentially distributed among ecosystems, wetland impacts significantly differed among wetland type.⁵⁸ At the landscape scale, cumulative impacts were significant, as indicated by different ratios of wetland types (e.g., riverine to slope) in impact areas and conversion of one functional class of wetland to another (e.g., a fivefold increase in cover of fringe wetlands in the low lands—an unnatural type for the ecoregion).⁵⁹ This type of watershed analysis can be used to alert decisionmakers to unacceptable impacts on individual types of wet-

53. The Nature Conservancy, *Mukwonago River Watershed*, <http://www.nature.org/wherewework/northamerica/states/wisconsin/preserves/art5037.html> (accessed Aug. 13, 2008).

54. Brad Johnson, *Hydrogeomorphic Wetland Profiling: An Approach to Landscape and Cumulative Impacts Analyses*, EPA/620/R-05/001 (EPA Jan. 2006).

55. *Id.* at 16.

56. *Id.* at 28.

57. *Id.*

58. *Id.*

59. *Id.* at 37.

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lands, offer a rationale for avoidance, and provide better scientific guidance for mitigation planning.

It is essential to identify the watershed scale that best suits the mitigation process. The largest scales, such as the Mississippi River Basin and the Great Lakes watersheds (see Figure 1), appear impractical for individual permitting because multiple Corps districts and states would need to coordinate their efforts. We do see the need, however, for districts and states to coordinate their tracking and reviewing of mitigation goals and decisions over time in order to answer critical questions, such as: Are mitigation sites replacing the region's diversity of wetland types and functions? Are wetland losses of one type in one subregion being compensated by gains in another? What is the cumulative effect of wetland losses and change?⁶⁰ The Nature Conservancy addressed these kinds of issues many years ago when it shifted from a state-by-state conservation approach to an ecoregion approach, which crossed boundaries of states and member chapters.⁶¹

60. B.L. Bedford, *Cumulative Effects on Wetland Landscapes: Links to Wetland Restoration in the United States and Southern Canada*, 19 *Wetlands* 775, 775 (1999).

61. The Nature Conservancy, *supra* n. 53.



FIGURE 1: The Great Lakes Watershed⁶²

In order to implement effective watershed approaches, watershed plans need to be developed. An example is the plan for managing river reaches within the Bega Watershed located south of Sydney, Australia.⁶³ Reaches were first categorized for their condition (from intact to poor) and then prioritized for recovery potential (from high to low).⁶⁴ Next, a strategic plan was developed for conserving the intact reaches and restoring the reaches, beginning with those where lost functions were critically needed and where the potential for recovering lost structure and functioning was highest (see Figure 2).⁶⁵

62. Natl. Oceanic & Atmospheric Administration, *Great Lakes Environmental Research Laboratory Photogallery—Maps*, <http://www.glerl.noaa.gov/pubs/photogallery/Maps/pages/0867.html> (accessed Apr. 2, 2009).

63. Gary A. Brierley & Kristie A. Fryirs, *Practical Application of the River Styles Framework as a Tool for Catchment-Wide River Management: A Case Study from Bega Catchment, New South Wales, Australia* (Macquarie U. 2005) (e-book available at <http://www.riverstyles.com/ebook.php>).

64. *Id.* at 19–22.

65. *Id.* at 22–24, 31–34.

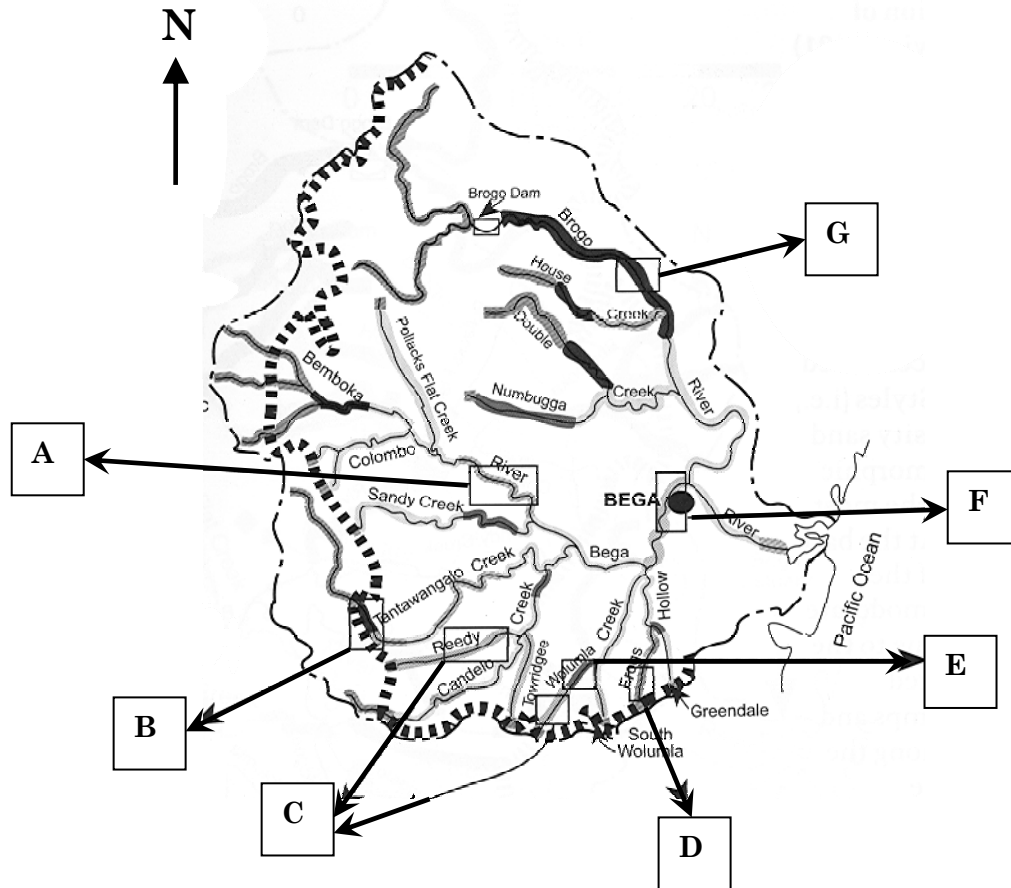


FIGURE 2: Prioritization of Management Reaches within the Bega Catchment in New South Wales, Australia ⁶⁶

66. *Id.* at 195, Figure 7.6 (figure modified from original). Letters correspond with Figure 2 (above).

- A. **BEMBOKA RIVER**—*River Style:* Confined valley with occasional floodplain pockets; *Issues:* isolated reach in good condition, can act as foci for extension of geomorphic structures and vegetation associations; *Condition:* Good; *Recovery Potential:* High; *Target Condition:* extend connectivity of good condition reaches to upstream and downstream reaches; *Priority:* High.
- B. **TANTAWANGALO CREEK**—*River Style:* Partly-confined valley with bedrock-controlled discontinuous floodplain; *Issues:* Incursions of exotic weeds threaten the integrity of the reach and upstream conservation reaches; *Condition:* Good; *Recovery Potential:* High; *Target Condition:* extend connectivity of

Another example is the Wisconsin Department of Natural Resources' work in the Milwaukee River Basin, where maps were made to identify both existing and potentially restorable wetlands based on hydric soils.⁶⁷ To help planners prioritize restoration or mitigation efforts among the many potential sites upstream of Milwaukee, Bernthal overlaid data on land use and recommended that restoration sites near large blocks of undeveloped land or habitat be given higher priority, assuming greater potential for biodiversity support by increasing the size of habitat blocks.⁶⁸ The work led to a tool that planners within the basin could use to se-

good condition reaches throughout the subcatchment by improving vegetation associations; *Priority*: High.

- C. **WOLUMLA & REEDY CREEKS**—*River Style*: Channelised fill; *Issues*: sediment release threatens downstream reaches; *Condition*: Moderate/Good; *Recovery potential*: Moderate; *Target Condition*: improve vegetation composition and coverage, enhance sediment storage and retention of fine grained materials on channel bed; *Priority*: Strategic.
- D. **FROGS HOLLOW AND TOWRIDGEE SWAMPS**—*River Style*: Intact valley fill; *Issues*: headcut threatens to incise swamp; *Condition*: Good; *Recovery Potential*: Intact; *Target Condition*: improve vegetation composition and coverage, retain base flows through swamp and retain sediment within swamp; *Priority*: Conservation with Strategic reach downstream.
- E. **WOLUMLA CREEK**—*River Style*: Partly-confined with bedrock-controlled discontinuous floodplain; *Issues*: channel expansion; *Condition*: Poor; *Recovery Potential*: Low; *Target Condition*: reduce channel dimensions through bench formation, induce pool-riffle development, retain sediments on point bars; *Priority*: Low.
- F. **LOWER BEGA RIVER**—*River Style*: Low sinuosity sand bed; *Issues*: sediment slug locks up large volumes of sediment, sediment release will lead to estuarine degradation; *Condition*: Moderate; *Recovery Potential*: Moderate-Low (due to cumulative effects of disturbance and continued sediment input from upstream); *Target Condition*: lock up sediment in vegetated islands, maintain low flow channels, reduce channel dimensions, improve vegetation associations; *Priority*: Strategic.
- G. **BROGO RIVER**—*River Style*: Confined valley with occasional floodplain pockets; *Issues*: connected reach in good condition, extend longitudinal connectivity of geomorphic structures and vegetation associations; *Condition*: Good; *Recovery Potential*: High; *Target Condition*: improve vegetation composition through weed management; *Priority*: High.

Id.

67. Marsha Burzynski, *The State of the Milwaukee River Basin* 32 (Marsha Burzynski ed., Wis. Dept. Nat. Resources 2001) (available at http://www.dnr.state.wi.us/org/gmu/milw/Milwaukee_801.pdf).

68. *Id.* at 57.

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lect wetlands for restoration. Other analyses rely more explicitly on hydrogeomorphic concepts.⁶⁹

While these examples postdate the NRC report, they show that watershed analysis and planning can prioritize sites for wetland restoration and mitigation.

2. *The Watershed Approach in the Mitigation Regulation*

As noted above, the NRC report recommended that “[s]ite selection for wetland conservation and mitigation should be conducted on a watershed scale.”⁷⁰ The mitigation regulation adopts “a watershed approach to compensatory mitigation, and emphasizes that compensatory mitigation projects should be placed in appropriate locations within a watershed.”⁷¹ It specifically defines watershed,⁷² watershed approach,⁷³ and watershed plan.⁷⁴ The

69. *E.g.* Dennis F. Whigham, Amy Deller Jacobs, Donald E. Weller, Thomas E. Jordan, Mary E. Kentula, Susan F. Jensen & Donald L. Stevens, *Combining HGM and EMAP Procedures to Assess Wetlands at the Watershed Scale—Status of Flats and Non-Tidal Riverine Wetlands in the Naticoke River Watershed, Delaware and Maryland (USA)*, 27 *Wetlands* 462 (2007); Denice H. Wardrop, Mary E. Kentula, Susan F. Jensen, Donald L. Stevens, Jr., Kristen C. Hychka & Robert P. Brooks, *Assessment of Wetlands in the Upper Juanita Watershed in Pennsylvania, USA Using the Hydrogeomorphic Approach*, 27 *Wetlands* 432 (2007). One (largely untested) assumption is the linkage between wetland condition and function. A national assessment of wetland conditions is expected in 2011. EPA, *Natl. Wetland Condition Assessment*, <http://www.epa.gov/wetlands/survey/> (last updated Jan. 15, 2009).

70. Natl. Research Council, *supra* n. 1, at 59.

71. 73 Fed. Reg. at 19619.

72. 33 C.F.R. § 332.2; 40 C.F.R. § 230.92. “Watershed” is defined based on the EPA’s 2006 Watershed Plan Handbook. Env’tl. Protec. Agency, *Handbook for Developing Watershed Plans to Restore and Protect Our Waters* 388 (Env’tl. Protec. Agency 2006). “Watershed means a land area that drains to a common waterway, such as a stream, lake, estuary, wetland, or ultimately the ocean.” 33 C.F.R. § 332.2; 40 C.F.R. § 230.92.

73. *Id.* “Watershed approach” is defined as:

[A]n analytical process for making compensatory mitigation decisions that support the sustainability or improvement of aquatic resources in a watershed. It involves consideration of watershed needs, and how locations and types of compensatory mitigation projects address those needs. A landscape perspective is used to identify the types and locations of compensatory mitigation projects that will benefit the watershed and offset losses of aquatic resource functions and services caused by activities authorized by DA permits. The watershed approach may involve consideration of landscape scale, historic and potential aquatic resource conditions, past and projected aquatic resource impacts in the watershed, and terrestrial connections between aquatic resources when determining compensatory mitigation requirements for DA permits.

Id. The regulation goes on to say that:

regulation also discusses watershed scale;⁷⁵ while this remains a variable, some guidance is provided in the context of service areas for mitigation banks and in-lieu fee programs.⁷⁶

The mitigation regulation states that, when making Section 404 permit decisions, the Corps “must use a watershed approach

A watershed approach to compensatory mitigation should include, to the extent practicable, inventories of historic and existing aquatic resources, including identification of degraded aquatic resources, and identification of immediate and long-term aquatic resource needs within watersheds that can be met through permittee-responsible mitigation projects, mitigation banks, or in-lieu fee programs. Planning efforts should identify and prioritize aquatic resource restoration, establishment, and enhancement activities, and preservation of existing aquatic resources that are important for maintaining or improving ecological functions of the watershed. The identification and prioritization of resource needs should be as specific as possible, to enhance the usefulness of the approach in determining compensatory mitigation requirements.

33 C.F.R. § 332.3(c)(2)(iv); 40 C.F.R. § 230.93(c)(2)(iv).

74. 33 C.F.R. § 332.2; 40 C.F.R. § 230.92. “Watershed plans” are:

plan[s] developed by federal, tribal, state, and/or local government agencies or appropriate non-governmental organizations, in consultation with relevant stakeholders, for the specific goal of aquatic resource restoration, establishment, enhancement, and preservation. A watershed plan addresses aquatic resource 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 wetland management plans.

Id.

75. 33 C.F.R. § 332.3(c)(4); 40 C.F.R. § 230.93(c)(4). The regulation states that:

[t]he size of watershed addressed using a watershed approach should not be larger than is appropriate to ensure that the aquatic resources provided through compensation activities will effectively compensate for adverse environmental impacts resulting from activities authorized by DA permits. The district engineer should consider relevant environmental factors and appropriate locally developed standards and criteria when determining the appropriate watershed scale in guiding compensation activities.

Id. The preamble noted that “[m]any of these questions, such as how to determine watershed scale and boundaries, must be answered by district engineers at a regional or local level, to address landscape variability and other factors.” 73 Fed. Reg. at 19608.

76. 33 C.F.R. § 332.8(d)(6)(ii)(A); 40 C.F.R. § 230.98(d)(6)(ii)(A). For banks and in-lieu-fee programs,

[t]he service area is the watershed, ecoregion, physiographic province, and/or other geographic area within which the mitigation bank or in-lieu fee program is authorized to provide compensatory mitigation required by DA permits. The service area must be appropriately sized to ensure that the aquatic resources provided will effectively compensate for adverse environmental impacts across the entire service area. For example, in urban areas, a U.S. Geological Survey 8-digit hydrologic unit code (HUC) watershed or a smaller watershed may be an appropriate service area. In rural areas, several contiguous 8-digit HUCs or a 6-digit HUC watershed may be an appropriate service area.

Id.

to establish compensatory mitigation requirements . . . to the extent appropriate and practicable.”⁷⁷ If a watershed plan exists, the Corps will determine if it is appropriate for compensatory mitigation decisions, and if so, the Corps *should* base its watershed approach on that plan. If there is no watershed plan available, or if it is deemed not appropriate, the Corps still must follow a watershed approach, which “should be based on information provided by the project sponsor or available from other sources.”⁷⁸ The regulation emphasizes that “[t]he ultimate goal of a watershed approach is to maintain and improve the quality and quantity of aquatic resources within watersheds through strategic selection of compensatory mitigation sites.”⁷⁹

The endorsement of the watershed approach in the regulation is a positive development, although the regulation does not require that watershed plans be developed or followed. To be sure, the regulation contemplates that “watershed plans will be developed by governmental and/or non-profit resource planners, in consultation with watershed stakeholders,” noting that a plan’s purpose “is to maintain and improve the quality and quantity of

77. 33 C.F.R. § 332.3(c)(1); 40 C.F.R. § 230.93(c)(1).

78. 73 Fed. Reg. at 19691. When plans are lacking, the regulation provides the following:

In the absence of a watershed plan determined by the district engineer under paragraph (c)(1) of this section to be appropriate for use in the watershed approach, the district engineer will use a watershed approach based on analysis of information regarding watershed conditions and needs, including potential sites for aquatic resource restoration activities and priorities for aquatic resource restoration and preservation. Such information includes: current 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 compensatory mitigation projects; and chronic environmental problems such as flooding or poor water quality.

33 C.F.R. § 332.3(c)(3); 40 C.F.R. § 230.93(c)(3). If there is no watershed plan, “the watershed approach should be based on a structured consideration of watershed needs and how wetlands and other types of aquatic resources in specific locations will address those needs.” 73 Fed. Reg. at 19599.

79. *Id.* at 19691. Thus the Corps can decide, in the context of a watershed approach, to authorize out-of-kind mitigation:

If the district engineer determines, using the watershed approach in accordance with paragraph (c) of this section that out-of-kind compensatory mitigation will serve the aquatic resource needs of the watershed, the district engineer may authorize the use of such out-of-kind compensatory mitigation. The basis for authorization of out-of-kind compensatory mitigation must be documented in the administrative record for the permit action.

33 C.F.R. § 332.3(e)(2); 40 C.F.R. § 230.93(e)(2).

aquatic resources within a watershed, not to facilitate development.”⁸⁰ Moreover, the regulation encourages Corps district engineers “to establish regional strategies for compensatory mitigation, through watershed planning or other means.”⁸¹ Yet there is neither a firm requirement nor guidance for developing restoration plans at the watershed scale. We note, however, that even the NRC report recognized that “implementing a watershed approach does not mean writing a plan that is expected to guide future permitting decisions.”⁸²

While the regulation requires Corps field personnel to implement a watershed approach when making Section 404 permit decisions (and at least encourages the use of watershed plans),⁸³ a continuing concern is that the Corps will not have the necessary resources and expertise to do so. Furthermore, it is critical that Corps headquarters revise the Regulatory Program Priorities in its Standard Operating Procedures (SOP) to reflect an institutional commitment to the watershed approach. At the time of the NRC report, the SOP identified six “segments” as priorities, and “Watershed Approaches” was listed as the first segment.⁸⁴ The SOP, however, assigned it a range of 0%–20%, which meant that a Corps district should spend 0%–20% of its budget on watershed activities.⁸⁵ As the SOP itself makes clear, the lower range of 0% “indicates that these are not mandatory segments of Regulatory Program work.”⁸⁶ The Corps is currently revising its SOP,⁸⁷ and how it treats “Watershed Approaches” will demonstrate its level of commitment to adopting a watershed approach.

80. 73 Fed. Reg. at 19610.

81. *Id.* at 19620.

82. Natl. Research Council, *supra* n. 1, at 144.

83. 73 Fed. Reg. at 19620.

84. Natl. Research Council, *supra* n. 1, at 272. The SOP further divides the segments into “above-the-line” activities and “below-the-line” activities. *Id.* at 101–102. The former are regulatory priorities, while the latter are not. *Id.* Indeed, the NRC report noted “that ‘below-the-line’ activities should be accomplished only after the ‘above-the-line’ activities are fully executed.” *Id.* at 102. At that time, “below-the-line” activities included “compliance inspections for all mitigation” and “multiple visits to a mitigation site.” *Id.* Accordingly, the NRC report found that “careful evaluation of mitigation projects” was not a Corps priority. *Id.*

85. *Id.* at 272.

86. *Id.*

87. 73 Fed. Reg. at 19644. The revision of the SOP presents another opportunity for the Corps to establish an institutional commitment to evaluate mitigation projects carefully.

One aspect of the regulation does provide an incentive for watershed planning. As discussed in more detail below, the regulation sets forth a hierarchy of mitigation options, starting with a preference for mitigation bank credits, followed by in-lieu fee program credits, and then various types of permittee-responsible mitigation.⁸⁸ There is no prescription, however, that these preferences must be followed in all cases, and mitigation providers that use a watershed plan may find the Corps amenable to deviate from the hierarchy. Indeed, the agencies decided to keep in-lieu fee programs as a compensatory mitigation option because of their potential in “identifying and addressing high-priority resource needs on a watershed scale.”⁸⁹

3. Sequencing and Difficult-to-Replace Wetlands in the Watershed Context

The NRC report noted that one concern about adopting a watershed approach was that it “might weaken the commitment during the permitting process to protect individual wetlands and the functions they provide, with existing wetlands being traded too readily for compensatory wetlands that might not be ecologically functional.”⁹⁰ Specifically, the concern focused on whether the mitigation “sequence” would be maintained to protect wetlands that are rare or unique and difficult to restore or create.⁹¹

Since 1990, the Corps and EPA have interpreted the mitigation requirements of the Section 404(b)(1) guidelines to mean that a permit applicant must follow a prescribed sequence of avoid, minimize, and compensate.⁹² The applicant must first avoid wet-

88. 73 Fed. Reg. at 19606.

89. *Id.* at 19691. The agencies explained that “to support a watershed approach for compensatory mitigation, we are retaining in-lieu fee programs as a separate form of third-party mitigation in this final rule, because in-lieu fee programs can provide ecologically beneficial compensatory mitigation in areas not served by mitigation banks.” *Id.* at 19606. Elsewhere in the preamble, the agencies stated also that “in-lieu fee programs can provide important ecological and societal benefits by focusing primarily on the watershed needs and by siting multiple compensatory mitigation projects in strategic locations in a watershed.” *Id.* at 19594.

90. Natl. Research Council, *supra* n. 1, at 144.

91. *Id.*

92. *Memorandum of Agreement between the Environmental Protection Agency and the Department of the Army concerning the Determination of Mitigation under the Clean Water Act Section 404(b)(1) Guidelines*, pt. II (Feb. 6, 1990) (available at <http://www.wetlands>

land impacts to the extent practicable; then minimize any unavoidable impacts; and finally compensate for those remaining impacts through restoration, enhancement, creation, and/or preservation of other wetlands.⁹³ The committee strongly recommended that, as part of a watershed approach, impacts to wetlands that are difficult or impossible to restore should be avoided.⁹⁴ In particular, the NRC report cited bogs and fens as examples of wetland types that are difficult or impossible to restore.⁹⁵

The mitigation regulation reaffirms, and in some ways may strengthen, the requirement of sequencing. Prior to the mitigation regulation, sequencing was articulated most clearly in guidance documents, such as the 1990 Corps-EPA Memorandum of Agreement.⁹⁶ Guidance documents inform the regulated community and public about how an agency interprets a statute or regulation, and they can be very helpful in explaining how an agency intends to exercise its discretion.⁹⁷ Guidance documents, however, do not have the force of law.⁹⁸ They are not legally binding like a statute or regulation.⁹⁹ Thus, an agency can, and will, depart from its guidance, often without legal ramifications.¹⁰⁰

In its opening subsection, the mitigation regulation expressly uses the term “sequencing.”¹⁰¹ It then states that nothing in the mitigation regulation affects the requirements of the Section 404(b)(1) guidelines. The mitigation rule proceeds to emphasize that the Corps will issue permits (and will require compensatory mitigation) only after the permit applicant has taken “all appropriate and practicable steps to avoid and minimize adverse im-

.com/fed/moafe90.htm).

93. *Id.*

94. *Id.*

95. *Id.*

96. *See id.* (discussing mitigation sequencing).

97. Royal C. Gardner, *Legal Considerations*, in *Conservation & Biodiversity Banking: A Guide to Setting Up and Running Biodiversity Credit Trading Systems* 72 (Nathaniel Carroll, Jessica Fox & Ricardo Bayon eds., Earthscan 2008).

98. *Id.*

99. *Id.* at 71.

100. *Natl. Mitigation Banking Assn. v. U.S. Army Corps of Engrs.*, 2007 U.S. Dist. LEXIS 10528 at **91–105 (N.D. Ill. Feb. 14, 2007) (noting that in-lieu fee guidance is not a binding regulation).

101. 33 C.F.R. § 332.1(c)(1); 40 C.F.R. § 230.91(c)(1).

pacts to waters of the United States.”¹⁰² The affirmation of the obligation to avoid and minimize wetland impacts in a binding regulation, rather than a mere guidance document, is a positive development.

The mitigation regulation also addresses the issue of difficult-to-replace wetlands;¹⁰³ however, the discussion with respect to avoidance is not as clear as we would have hoped. In a subsection discussing mitigation type in the context of the watershed approach, the regulation states:

For difficult-to-replace resources (e.g., bogs, fens, springs, streams, Atlantic white cedar swamps) if further avoidance and minimization is not practicable, the required compensation should be provided, if practicable, through in-kind rehabilitation, enhancement, or preservation since there is greater certainty that these methods of compensation will successfully offset permitted impacts.¹⁰⁴

Although this passage explains the preferred compensation procedures for difficult-to-replace wetlands and other aquatic resources,¹⁰⁵ it does not necessarily call for greater avoidance of such impacts in the first instance. Arguably, the use of the term “further avoidance” suggests a heightened level of attention at the first stage of the mitigation sequence, but such a directive is only implicit in the regulatory language. Moreover, the inclusion of the word “practicable”—i.e., the further avoidance and minimization must be practicable—offers the Corps undue discretion as to whether to require the permit applicant to avoid or reduce wetland impacts. To be sure, the regulation does expand upon the committee’s examples of difficult-to-restore wetlands and helps illustrate how preservation fits into a watershed approach. The agencies have suggested that additional guidance on the issue of difficult-to-restore wetlands may be forthcoming,¹⁰⁶ which could encourage greater avoidance. But as noted above, guidance is simply that—guidance—which may or may not be followed in the

102. 33 C.F.R. § 332.1(c)(1); 40 C.F.R. § 230.91(c)(1); *see also* 33 C.F.R. § 332.3(a); 40 C.F.R. § 230.93(a) (stating that compensatory mitigation offsets “unavoidable impacts”).

103. 33 C.F.R. § 332.3(e)(3); 40 C.F.R. § 230.93(e)(3).

104. 33 C.F.R. § 332.3(e)(3); 40 C.F.R. § 230.93(e)(3).

105. 33 C.F.R. § 332.3(e)(3); 40 C.F.R. § 230.93(e)(3).

106. 73 Fed. Reg. at 19608.

field. It would have been better to address the issue expressly in the regulation.

B. Establishing Expectations: Operational Guidelines and Performance Standards

1. NRC Operational Guidelines

To develop a self-sustaining mitigation project that performs at a functionally high level and restores ecological processes, one must consider the design, implementation, and long-term management phases of a project together. The NRC report articulated ten operational guidelines¹⁰⁷ that presented practical design and implementation criteria for mitigation projects. Based on the committee's research and experience, these guidelines offered pragmatic advice on final site selection and the philosophy that should underpin the subsequent design, including the presumption that the site should be managed as a conservation-type property over the long term. The operational guidelines were organized in an order that is generally chronological in the life of a mitigation project, from big-picture concept and site design to post-implementation adaptive management. The Corps incorporated the operational guidelines verbatim into a 2002 guidance document (Regulatory Guidance Letter),¹⁰⁸ and the Corps and EPA incorporated most of the concepts into the new mitigation

107. Natl. Research Council, *supra* n. 1, at 123–128. The guidelines are:

- (1) Consider the hydrogeomorphic and ecological landscape and climate.
- (2) Adopt a dynamic landscape perspective.
- (3) Restore or develop naturally variable hydrological conditions.
- (4) Whenever possible, choose wetland restoration over creation.
- (5) Avoid overengineered structures in the wetland's design.
- (6) Pay particular attention to appropriate planting elevation, depth, soil type, and seasonal timing.
- (7) Provide appropriately heterogeneous topography.
- (8) Pay attention to subsurface conditions, including soil and sediment geochemistry and physics, groundwater quantity and quality, and infaunal communities.
- (9) Consider complications associated with creation or restoration in seriously degraded or disturbed sites.
- (10) Conduct early monitoring as part of adaptive management.

Id.

108. U.S. Army Corps of Engineers, *Regulatory Guidance Letter 02-02*, Appendix B, <http://www.usace.army.mil/cw/cecwo/reg/rxls/RGL2-02.pdf> (posted Dec. 24, 2002).

regulation, which supplants the Regulatory Guidance Letter.¹⁰⁹ The placement of these concepts in the regulation is a good step.

The regulation weaves the operational guidelines throughout its watershed approach to mitigation decisionmaking. The result of this broad approach is that those operational guidelines that address design concepts¹¹⁰ are generally included, while the operational guidelines that address design specifics regarding within-site variation¹¹¹ are generally not included. Although those fundamental underpinnings of the operational guidelines are addressed throughout the regulation, there is only a presumption that the mitigation plan designer and the permit reviewer are both well-experienced in site-specific design criteria, which is typically optimistic.

2. Performance Standards and Monitoring

An “if we build it *right*, they will come” concept is inherent in the operational guidelines. The regulation correctly devotes significant space to the watershed approach, site selection, and project design. In contrast, little space is devoted to the development and monitoring of performance standards, although the broad framework for the performance standards is appropriate. Sections 332.5 and 230.95 articulate the regulation’s requirements for ecological performance.¹¹² It is the shortest section of the new regulation, and it reads:

ECOLOGICAL PERFORMANCE STANDARDS

- (a) The approved mitigation plan must contain performance standards that will be used to assess whether the project is achieving its objectives. Performance standards should relate to the objectives of the compensatory mitigation project, *so that the project can be objectively evaluated to determine if it*

109. 33 C.F.R. § 332.1(f); 40 C.F.R. § 230.91(f). To reiterate from the discussion of sequencing, a regulation is more binding than a mere guidance document. Gardner, *supra* n. 97, at 71–72.

110. The operational guidelines that address design concepts are guidelines 1, 2, 3, 4, 5, 9, and 10. *Supra* n. 107.

111. The operational guidelines that address design specifics regarding within-site variation are guidelines 6, 7, and 8. *Supra* n. 107.

112. 33 C.F.R. § 332.5; 40 C.F.R. § 230.95.

is developing into the desired resource type, providing the expected functions, and attaining any other applicable metrics (e.g., acres).

- (b) Performance standards must be based on attributes that are objective and verifiable. *Ecological performance standards must be based on the best available science that can be measured or assessed in a practicable manner.* Performance standards may be based on variables or measures of functional capacity described in functional assessment methodologies, measurements of hydrology or other aquatic resource characteristics, and/or comparisons to reference aquatic resources of similar type and landscape position. The use of reference aquatic resources to establish performance standards will help ensure that those performance standards are reasonably achievable, by reflecting the range of variability exhibited by the regional class of aquatic resources as a result of natural processes and anthropogenic disturbances. Performance standards based on measurements of hydrology should take into consideration the hydrologic variability exhibited by reference aquatic resources, especially wetlands. *Where practicable, performance standards should take into account the expected stages of the aquatic resource development process, in order to allow early identification of potential problems and appropriate adaptive management.*¹¹³

The fundamentals of this section are appropriate. Paragraph (a) addresses the mitigation objectives that are of first importance, further clarifying that the target resource type (cypress swamp, salt marsh, etc.), the target functions (wading bird foraging, surface water storage, etc.), and the appropriate metrics (acres, cover, etc.) are the criteria with which to measure project site performance. Stated another way, the first paragraph addresses the regulatory philosophy regarding performance criteria, while the second addresses the pragmatic “how to” side of setting

113. 33 C.F.R. § 332.5; 40 C.F.R. § 230.95 (emphases added)

performance standards. This approach is consistent with the NRC report.

The manner in which Corps districts implement the sections on ecological performance standards and monitoring may well spell the ultimate success of the regulation. From a regulatory standpoint, developing meaningful, reasonable performance standards is a challenge. One must address in the permit how the objectives of the mitigation will be met, and the regulation does not go beyond *guiding* permit writers on how to write these criteria. The regulation indirectly suggests that the mitigation project's objectives will be assessed on the expected loss of functions at the impact site.¹¹⁴ These are the objectives that should be addressed in the performance standards. To ensure equivalency between the functions that have been lost and gained, the same functional assessment method should be used for the impact and mitigation sites. The *monitoring* that assesses ecological functions at the mitigation site should be based on the functional assessment methodology used at the impact site. Monitoring is a prerequisite to assessing whether or not the lost functions are offset. A consistent methodology for developing performance standards is not specifically articulated by the regulation but is implied. Furthermore, monitoring should involve metrics that are known or hypothesized to be factors controlling performance and should direct inputs into an adaptive management process.

From an implementation standpoint, both monitoring and its reporting must be practicable.¹¹⁵ First, the performance standards

114. 33 C.F.R. § 332.3(a)(1); 40 C.F.R. § 230.93(a)(1) (stating that “[c]ompensatory mitigation requirements must be commensurate with the amount and type of impact that is associated with a particular DA permit”).

115. A fundamental underpinning of the Section 404(b)(1) guidelines and the mitigation regulation is the concept of practicability. “Practicability” is defined in the guidelines as follows:

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 otherwise a 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.

40 C.F.R. § 230.10(a)(2) (2008). In measuring mitigation performance, one should distinguish between a research project that is intended to dissect wetland functions at a fine-grained level and performance measures that assess functions at a coarsely grained level. While the former may not typically be practicable, the latter—essentially a rapid assessment—is.

need to be sufficiently straightforward so that they are readily measurable in a timely and cost-efficient manner. It is important to note that what is measured should be directly tied to performance criteria and should have a relationship to remedial efforts that can be immediately taken if monitoring shows a negative trend in an explicit adaptive management process. Second, from the agency reviewer perspective, the reports need to be concise and directly relevant to the performance standards. Otherwise, the reports will go largely unreviewed due to staff time constraints, potentially promulgating a culture of non-compliance.

As a national regulation, specifying performance standards that would be appropriate for all types of wetlands and mitigation projects would not be pragmatic because of the variety of wetlands that are mitigated, both within and among regions. Furthermore, the requirement that performance standards “must” be based on the best available science would quickly render specific rule-based standards obsolete.¹¹⁶ The imperative to consider regional variation in mitigation projects is underscored by the directive in the regulation that calls on the Corps to account for regional characteristics when approving mitigation projects, determining performance standards, and setting monitoring requirements.¹¹⁷

The NRC report discusses a number of functional assessment methods that have been used in the past.¹¹⁸ Each of these methods is appropriate for use in certain locales, for certain types of wetland systems, and to address certain types of functions.¹¹⁹ Appendix E of the NRC report is a Technical Note¹²⁰ that outlines a twelve-step approach to developing regional performance standards.¹²¹ The Technical Note points out that developing regional

116. *Supra* n. 113 and accompanying text (providing the language of subsection (b)).

117. 33 C.F.R. § 332.1(a)(1); 40 C.F.R. § 230.91(a)(1). Regional variation is not confined to wetlands and applies to a decentralized organization such as the Corps as well. Accordingly, training and oversight (and a new SOP) will be necessary to ensure that Corps districts develop, monitor, and use performance standards in a consistently rigorous fashion.

118. Natl. Research Council, *supra* n. 1, at 128–136.

119. *Id.* at 128–132.

120. B. Streever, *Examples of Performance Standards for Wetland Creation and Restoration in Section 404 Permits and an Approach to Developing Performance Standards*, WRP Technical Notes Collection, TN WRP WG-RS-3.3 (Jan. 1999) (available at <http://el.erdc.usace.army.mil/wrtc/wrp/tnotes/wgrs3-3.pdf>).

121. *Id.* at 12–13.

performance standards streamlines the permitting process, saving time on the regulators' end.¹²² It also creates increased certainty for the mitigation provider. This approach, which utilizes wetland professionals (including regulatory staff, scientists, and others) is eminently sensible and should be adopted by the agencies.

In order to implement the regulation's directive to use the best available science,¹²³ the criteria must be revisited as new science and techniques are learned. The establishment of a feedback process, such as through a Web-based information sharing page, will be critical to keeping the performance standards up-to-date and utilizing the best available science.¹²⁴ The Florida Department of Environmental Protection (DEP) used this approach on a district-by-district basis, providing technical memos to staff as emerging technologies became known.¹²⁵ This approach clarified for regulators the degree of detail necessary to require for assess-

122. *Id.* at 12.

123. 33 C.F.R. § 332.5(b); 40 C.F.R. § 230.95(b).

124. See e.g. EPA, *Wetlands: Monitoring and Assessment*, <http://www.epa.gov/owow/wetlands/monitor/> (last updated Mar. 11, 2008) (showing an example of a feedback process via a Web-based information-sharing page).

125. Florida DEP, *Uniform Mitigation Assessment Methodology*, <http://www.dep.state.fl.us/water/wetlands/mitigation/umam.htm> (last updated Aug. 6, 2007). Examples of other technical memos include:

- A. Ertman & A. Redmond, *Mitigation Bank Rule Financial Responsibility Procedures*, SLER 1460 in SLERP Operations & Procedures Manual, Vol. IV: Application Processing (July 31, 1997) 18 pp. with 2 Appendices.
- A. Redmond, C. Forthman & C. Kindell, *Conservation Easement Procedures*, SLER 1515 in SLERP Operations & Procedures Manual, Vol. IV: Application Processing (Sept. 12, 1995) 54 pp. with 14 Appendices.
- A. Redmond, *Mitigation Procedures for ERP AH/BOR X.3*, SLER 1510 in SLERP Operations & Procedures Manual, Vol. IV: Application Processing (Sept. 7, 1995) 36 pp. with 10 Appendices.
- A. Redmond, *Mitigation Procedures for Chapter 62-312, Part III, FAC*, SLER 1510 in SLERP Operations & Procedures Manual, Vol. IV: Application Processing (Sept. 7, 1995) 30 pp. with 9 Appendices.
- A. Redmond, *Regulatory Evaluation of Exotic Removal Proposals*, Internal Guidance, FDEP (May 1994) 5 pp.
- A. Redmond, *Regulatory Assessment of Mucking Proposals: How to and What to Expect*, Internal Guidance, FDEP (May 1994) 3 pp.
- A. Redmond, *Regulatory Assessment of Tree Spading Proposals: How to and What to Expect*, Internal Guidance, FDEP (May 1994) 2 pp.
- D. Ferrell & A. Redmond, *Biology Section Report on the Biological Success of Mitigation Efforts at Selected Sites in Central Florida*, Internal Informational Memo. (Feb. 3, 1993).

ing project design and establishing appropriate performance metrics, as well as the reporting frequencies needed to assess functions for different types of wetlands.

The regulation's section on performance standards implicitly suggests a step-wise approach to assessing performance.¹²⁶ First, are the objectives of the mitigation project addressed by the performance standards? Second, are the target resource type and functions addressed in an objectively measurable way? Third, are there appropriate metrics defined by the performance standards (area, basal area, cover by vegetation versus water and bare ground, et cetera)?

At the time of the NRC report, most of the performance criteria in use were based on vegetation structure and viability,¹²⁷ in part because most permit reviewers and consultants had a basic understanding of how to measure and report vegetative cover and its partitioning among strata. The NRC report, however, noted that basing functional assessment and performance criteria simply on such floristic approaches has significant limitations as compared to methods that encompass more functions, ecosystem processes, and watershed-scale metrics.¹²⁸ As science evolves to offer more effective and practicable assessments of performance, the regulation allows for that science to be used. This will be a critically important factor in increasing the effectiveness of compensatory mitigation.¹²⁹

3. Adaptive Management

Adaptive management was the subject of the committee's tenth operational guideline.¹³⁰ On a positive note, the regulation incorporates the concept of adaptive management in the defini-

126. See 33 C.F.R. § 332.5; 40 C.F.R. § 230.95 (explaining the preferred approach to assessing performance standards).

127. Natl. Research Council, *supra* n. 1, at 221, 225–226.

128. *Id.* at 130.

129. The requirement that performance standards must be based on the best available science may become an avenue for environmentalists to challenge the issuance of permits. See *Defenders of Wildlife v. Hall*, 565 F. Supp. 2d 1160, 1171–1172 (D. Mont. 2008) (granting plaintiffs' motion for a preliminary injunction against the Endangered Species Act delisting of the northern Rocky Mountain gray wolf in part because the U.S. Fish and Wildlife Service ignored the best science available).

130. Natl. Research Council, *supra* n. 1, at 128.

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tional section¹³¹ and emphasizes that performance standards should be applied in an adaptive management framework.¹³² While the regulation's definition of adaptive management appears to focus on problems associated with mitigation sites (perhaps understandable in light of the history of compensatory mitigation efforts that did not comply with requirements), an important feature of adaptive management also involves developing conceptual models based on what has worked well on the ground.¹³³ Information on criteria that were and were not met should be part of a continuous feedback loop. Lessons learned from one site, whether positive or negative, must be made available systematically to regulators and mitigation providers. This can be viewed as programmatic adaptive management.

The ability to take corrective actions at a particular compensatory mitigation site is intrinsically related to effective monitoring based on a conceptual model and hypothesized responses. Monitoring alone, however, is not sufficient. As the regulation suggests, the Corps must require objective predictions based on the state of the science and conceptual models, analyze the monitoring results, identify potential problems, and direct the mitigation provider to implement remedial measures. Once again, we have concerns about whether the Corps will implement this concept effectively.

Consider, for example, the agencies' discussion in the preamble to the regulation of the issue of implementation. The agencies reported that a "number of commenters" raised worries about the

131. 33 C.F.R. § 332.2; 40 C.F.R. § 230.92. "Adaptive management" means: the development of a management strategy that anticipates likely challenges associated with compensatory mitigation projects and provides for the implementation of actions to address those challenges, as well as unforeseen changes to those projects. It requires consideration of the risk, uncertainty, and dynamic nature of compensatory mitigation projects and guides modification of those projects to optimize performance. It includes the selection of appropriate measures that will ensure that the aquatic resource functions are provided and involves analysis of monitoring results to identify potential problems of a compensatory mitigation project and the identification and implementation of measures to rectify those problems.

Id.

132. 33 C.F.R. § 332.4(c)(12); 40 C.F.R. § 230.94(c)(12).

133. J. B. Zedler & J.C. Callaway, *Adaptive Restoration: A Strategic Approach for Integrating Research into Restoration Projects in Managing for Healthy Ecosystems* 167, 167–174 (D.J. Rapport, W.L. Lasley, D.E. Rolston, N.O. Nielsen, C.O. Qualset & A.B. Damania, eds., Lewis Publishers 2003).

“enormous burden” that the new rules would place on Corps staff.¹³⁴ Attempting to allay these concerns, the preamble repeatedly assured that the “rule will not place a large incremental burden on Corps staff and other resources because it builds on existing requirements and practices.”¹³⁵ With respect to enforcement and compliance, “[t]he Corps believes that it has adequate resources in these areas.”¹³⁶ Yet, sandwiched between these statements on the same page is another that suggests a different state of affairs. The Corps concedes that “[b]ecause of resource constraints, site visits cannot be conducted for each permit application.”¹³⁷ Such resource constraints do not bode well for adaptive management, which requires careful oversight.¹³⁸

C. Mitigation Approaches: Mitigation Banks, In-Lieu Fees, and Permittee-Responsible Mitigation

1. *The Compensatory Mitigation Hierarchy*

One of the committee’s tasks was to examine the relative effectiveness of different compensatory mitigation approaches: permittee-responsible mitigation, mitigation banks, and in-lieu fee programs.¹³⁹ While our NRC committee concluded that “[t]hird-party compensation approaches (mitigation banks, in-lieu fee programs) offer some advantages over permittee-responsible mitigation,”¹⁴⁰ the committee did not reach a specific conclusion with respect to whether mitigation banks or in-lieu fee programs were the preferred mitigation approach. Rather than focusing on labels, the committee found it more appropriate to emphasize the characteristics or attributes of compensatory mitigation that would be more likely to lead to effective wetland mitigation. To that end, the committee recommended that compensatory mitiga-

134. 73 Fed. Reg. at 19609.

135. *Id.*

136. *Id.*

137. *Id.*

138. A small, but telling, example: As of February 2009, the Corps Web site had not updated its regulatory statistics since Fiscal Year 2003. See e.g. U.S. Army Corps of Engrs., *Regulatory Statistics*, http://www.usace.army.mil/CECW/Pages/reg_stats.aspx (accessed Apr. 2, 2009).

139. Natl. Research Council, *supra* n. 1, at 67–70, 149, 153–154.

140. *Id.* at 9.

tion be provided in a timely manner, preferably in advance of impacts from permitted activities, that the mitigation project be subjected to an interagency review process and that long-term stewardship obligations for the mitigation site be clear.¹⁴¹ The new regulation makes good progress in these areas.

The new regulation establishes a hierarchy of flexible preferences for mitigation approaches, which is relevant to the question of timing. When considering mitigation options, the Corps must examine the following in order: mitigation bank credits; in-lieu fee program credits; permittee-responsible mitigation under a watershed approach; on-site, in-kind permittee-responsible mitigation; and off-site and/or out-of-kind permittee-responsible mitigation.¹⁴² Mitigation bank credits are the first option, in part because credits are not released for debiting until the bank site has met specific milestones or performance standards.¹⁴³ The hierarchy, however, is not rigid, and the regulation permits the Corps to deviate from it for several reasons. For example, in some situations, if an in-lieu fee program has “released credits” generated by meeting specific milestones or performance standards, these credits may be used as the primary option. The regulation’s hierarchy

141. *Id.* at 166–168.

142. 33 C.F.R. § 332.3(b)(1); 40 C.F.R. § 230.93(b)(1).

143. *Id.* Prior to the regulation, the agencies had defined “mitigation banking” to be “advance mitigation.” 60 Fed. Reg. 58605, 58614 (Nov. 28, 1995). Some commentators criticized the characterization that mitigation banks provided “advance” mitigation. *See e.g.* Julie Sibbing, *Mitigation Banking: Will the Myth Ever Die?* 27 Natl. Wetlands Newsltr. 5 (Nov.–Dec. 2005). In the NRC report, the committee observed that bank credits were typically generated (and sold) in a phased approach; thus, some percentage of credits were released for sale prior to the completion of the mitigation project. Natl. Research Council, *supra* n. 1, at 88–89. The regulation has adopted a new definition of “mitigation bank,” dropping any reference to “advance”:

a site, or suite of sites, where resources (e.g., wetlands, streams, riparian areas) are restored, established, enhanced, and/or preserved for the purpose of providing compensatory mitigation for impacts authorized by DA permits. In general, a mitigation bank sells compensatory mitigation credits to permittees whose obligation to provide compensatory mitigation is then transferred to the mitigation bank sponsor. The operation and use of a mitigation bank are governed by a mitigation banking instrument.

33 C.F.R. § 332.2; 40 C.F.R. § 230.92.

Although the word “advance” has been excised, the new regulation emphasizes that mitigation bank credits are performance-based and are to be released only when certain administrative steps are taken or when certain ecological performance standards are met. 33 C.F.R. § 332.8(o)(8); 40 C.F.R. § 230.98(o)(8). Moreover, the regulation provides that “[t]he credit release schedule should reserve a significant share of the total credits for release only after full achievement of ecological performance standards.” *Id.*

places a premium on mitigation options that provide more timely compensatory mitigation.¹⁴⁴

Similarly, the hierarchy rewards mitigation projects that go through an interagency review process. Prior to their establishment, mitigation banks and in-lieu fee programs must be examined by an Interagency Review Team (IRT), which consists of representatives from various federal agencies and can include representatives from tribal, state, and local governments as well.¹⁴⁵ In contrast, permittee-responsible mitigation is not subjected to the same formal review process, which is why it appears lower in the hierarchy.¹⁴⁶

The regulation's hierarchy is in part a response to the NRC report's concerns about the timeliness of compensatory mitigation and interagency review.¹⁴⁷ While the NRC report did not call for mitigation banks to be placed at the top of a mitigation hierarchy, it did espouse a preference for mitigation provided in advance of impacts, which is a more common attribute of mitigation banks than of other forms of mitigation. Mitigation banks, if properly implemented, must meet performance standards before most of their environmental credits may be used to offset wetland impacts. The hierarchy appears sufficiently flexible, however, to allow a Corps regulator to choose a non-bank option if that option is environmentally preferable. As with any case involving exercise of discretion, no one knows for certain whether the regulators will make wise or unwise decisions (although we can be sure that there will be disagreement about that among the many players). The fact that the regulation increases public participation in and transparency of compensatory mitigation is helpful in this re-

144. An emphasis on timeliness does present a challenge with respect to slow-to-develop wetlands, and mitigation bankers and others may not wish to invest in projects that have a long time horizon. See J.J. Mack & M. Micacchion, *An Ecological Assessment of Ohio Mitigation Banks: Vegetation, Amphibians, Hydrology, and Soils*, Ohio EPA Technical Report WET/2006-1, 20 (Ohio Env'tl. Protec. Agency, Div. Surface Water, Wetland Ecology Group 2006) (available at <http://www.epa.state.oh.us/dsw/wetlands/WetlandEcologySection.html>) (noting that the desire to maximize bank credits led to shallow unvegetated ponds lacking in habitat value). Such a concern again counsels for avoidance of such wetland impacts.

145. 33 C.F.R. § 332.8(b); 40 C.F.R. § 230.98(b).

146. See 33 C.F.R. § 332.3(b)(4); 33 C.F.R. § 332.3(k)(2); 40 C.F.R. § 230.93(b)(4); 40 C.F.R. § 230.93(k)(2).

147. See Natl. Research Council, *supra* n. 1, at 139, 150, 167 (stating that compensatory mitigation should be conducted preferably before the permitted activity).

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gard.¹⁴⁸ Public involvement should be an added impetus to implementing the mitigation hierarchy in a reasonable manner.

2. Long-Term Stewardship

The regulation also addresses the issue of long-term stewardship, which the NRC report considered a time frame “typically accorded to other publicly valued natural assets, like parks.”¹⁴⁹ While the NRC report offered operational guidelines for self-sustaining mitigation sites, we also recognized that the “presumption that once mitigation sites meet their permit criteria they will be self-sustaining in the absence of any management or care is flawed.”¹⁵⁰ The site may require prescribed burns or protection from invasive species or human trespassers. Long-term management and protection requires several components, including a knowledgeable and dedicated steward, legal protections (such as conservation easements or deed restrictions), and the financial resources that the steward can use to respond to threats (ecological or legal). Accordingly, the NRC report recommended that a cash endowment be established for all mitigation sites, even for permittee-responsible mitigation.¹⁵¹

The regulation provides that all forms of compensatory mitigation—permittee-responsible, mitigation banks, and in-lieu fee programs—must discuss long-term management in their mitiga-

148. 33 C.F.R. § 332.8(b)(2); 40 C.F.R. § 98(b)(2). Some of the provisions regarding public participation and access to mitigation information include: 33 C.F.R. § 332.4(b)(1–2) and 40 C.F.R. § 230.94(b)(1–2) (requiring public notice of proposed activity with statement about compensatory mitigation); 33 C.F.R. § 332.8(d)(4) and 40 C.F.R. § 230.98(d)(4) (requiring public notice of mitigation bank and in-lieu fee programs); 33 C.F.R. § 332.8(d)(5)(iii) and 40 C.F.R. § 230.98(d)(5)(iii) (requiring public notice of revised prospectus); and 33 C.F.R. § 332.8(q)(1) and 40 C.F.R. § 230.98(q)(1) (requiring credit ledger to be available upon request). These provisions may induce certain Corps districts to improve their recordkeeping. *Cf.* Abbey Anne Tyrna, *Wetland Mitigation Banks and the No-Net-Loss Requirement: An Evaluation of the Section 404 Permit Program in Southeast Louisiana* 58 (unpublished graduate thesis, La. St. U., May 2008) (copy on file with *Stetson Law Review*) (reporting that the New Orleans District’s recordkeeping system has “a host of data quality problems including missing permit files, incomplete mitigation information, and the inability to perform a timely cumulative evaluation of wetland permits and mitigation” and that “mitigation bank documents are unorganized,” with “[o]nly one monitoring report and one Wetland Value Assessment . . . identified within the four mitigation bank files”).

149. Natl. Research Council, *supra* n. 1, at 157.

150. *Id.* at 152.

151. *Id.* at 153–154.

tion plans that are submitted to the Corps.¹⁵² Indeed, an entire subsection is dedicated to mitigation site management.¹⁵³ The regulation, however, seems to leave it to the Corps' discretion whether to impose long-term management requirements in the permit or mitigation bank or in-lieu fee instrument.

On the positive side, the regulation states that all mitigation sites "*must* be provided long-term protection through real estate instruments or other available mechanisms, as appropriate."¹⁵⁴ Options include conservation easements, transfer of title to resource agencies or land trusts, and restrictive covenants.¹⁵⁵ The use of the mandatory "*must*" suggests that this requirement is not discretionary.¹⁵⁶ Similarly, the regulations state that the "permit conditions or instrument *must* identify the party responsible for . . . all long-term management of the compensatory mitigation project."¹⁵⁷ The mandatory nature of the obligations appears to dissipate, however, when the regulation turns to the financing of long-term stewardship responsibilities.

The regulation sends a more ambivalent message about the arrangement of financing for long-term obligations. It states that when "necessary to ensure long-term sustainability (e.g., prescribed burning, invasive species control, maintenance of water control structures, easement enforcement), the responsible party *must* provide for such management and maintenance," which "includes the provision of long-term financing mechanisms *where necessary*."¹⁵⁸ Although the use of "*must*" suggests that long-term financing is a hard requirement, it is undercut by the concluding caveat "*where necessary*."

152. 33 C.F.R. § 332.7(d)(1); 40 C.F.R. § 230.97(d)(1). As with other aspects of a mitigation plan, the details regarding long-term management "should be commensurate with the scale and scope of the impacts." 33 C.F.R. § 332.4(c)(1)(i); 40 C.F.R. § 230.94(c)(1)(i).

153. 33 C.F.R. § 332.7; 40 C.F.R. § 230.97.

154. 33 C.F.R. § 332.7(a); 40 C.F.R. § 230.97(a) (emphasis added).

155. 33 C.F.R. § 332.7(a); 40 C.F.R. § 230.97(a).

156. 33 C.F.R. § 332.7(a); 40 C.F.R. § 230.97(a). We interpret the "as appropriate" qualifier to mean the selection of an appropriate long-term protection mechanism, not whether long-term protection is appropriate.

157. 33 C.F.R. § 332.7(d); 40 C.F.R. § 230.97(d) (emphasis added). The regulations allow for the party responsible for long-term management to transfer its obligations to "a land stewardship entity, such as a public agency, non-governmental organization, or private land manager" with the approval of the Corps. *Id.*

158. 33 C.F.R. § 332.7(b); 40 C.F.R. § 230.97(b) (emphases added).

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Permit applicants, mitigation providers, and regulators devote much time, energy, and resources on the front end of compensatory mitigation.¹⁵⁹ In light of these efforts, it would be wasteful and imprudent to fail to plan for long-term management of these sites. The Corps needs to ensure that mitigation providers arrange for financial resources to be available at the back end of the process. This is the first time that any requirements regarding the financing for long-term stewardship have appeared in a regulation, which is noteworthy, especially with respect to permittee-responsible mitigation. Guidance on this subject, and more importantly, the actual practice in Corps districts, will bear careful watching.

III. CONCLUDING THOUGHTS AND COMMENTS

As we have noted throughout this Article, although the new regulation represents significant progress, much depends on implementation in the field and the degree to which the regulatory provisions are viewed by the Corps as discretionary or obligatory. Will Corps headquarters revise the SOP to demand more attention to the watershed approach and compensatory mitigation? How will individual Corps regulators exercise their discretion? Will greater avoidance be required? Will long-term financing be required on a regular basis? How will mitigation providers and permittees respond? To raise these questions or to express doubt should not necessarily be seen as criticism of the regulation itself. Rather, the questions recognize that the codification of rules and principles is but one step toward the goal of no net loss. In the NRC report, we drew a distinction between legal compliance and ecological outcomes: a mitigation provider might satisfy the permit standards, but the resulting wetland might not provide the desired ecological functions.¹⁶⁰ Similarly, the issuance of the regulation can be seen as a legal success, but this does not necessarily translate into better and more sustainable compensatory mitiga-

159. See generally Env'tl. L. Inst., *Mitigation of Impacts to Fish and Wildlife Habitat: Estimating Costs and Identifying Opportunities* (Oct. 2005) (available at http://www.elistore.org/reports_detail.asp?ID=11248).

160. Nat'l. Research Council, *supra* n. 1, at 117.

tion projects. Deeply ingrained institutional practices and priorities must be modified for ecological progress to occur.

With that observation in mind, we offer several recommendations to help with achieving the goal of no net loss:

- *Increased Support for Regulators.*¹⁶¹ The agencies, especially the Corps, should commit funds to prepare regulators to oversee compensatory mitigation projects properly. A good model is the MBRT (now IRT) Academy held for the past two summers at the National Conservation Training Center in West Virginia, in which representatives from the Corps, EPA, FWS, NOAA, and state and local agencies gathered for one week of intensive training.¹⁶² Similar sessions need to be held on the subject of permittee-responsible mitigation. In addition, the agencies should develop a series of regional reference manuals that outline how projects should be designed to achieve better ecological outcomes.
- *Outside Review of Mitigation Projects:* A positive development is the increased transparency and public participation in the compensatory mitigation process. Indeed, we understand that the Corps plans to post on its Web site maps of existing mitigation sites and monitoring reports. We encourage the Corps and EPA to expand and codify this participation into the oversight of compensatory mitigation projects. The agencies should consider formalizing external peer review by entering into cooperative arrangements with local universities to conduct studies of compensatory mitigation sites, with an eye toward factors that affect performance. More broadly, we recommend that the Section 404 program should have a permanent external review panel, staffed by independent experts, that focuses on compensatory mitigation outcomes. We recommend that the EPA, with its oversight authority, create

161. One of the principal conclusions of the NRC report was that “[s]upport for regulatory decision-making is inadequate.” *Id.* at 8 (Conclusion 4).

162. See The Conservation Fund, *Mitigation Banking IRT Sources*, http://www.conservationfund.org/irt_mitigation_training (accessed Apr. 15, 2009) (providing training materials).

the panel through a transparent process that includes a public comment period.

- *Use Adaptive Management Principles for Application of New Regulation:* Just as mitigation providers must now incorporate the concept of adaptive management into mitigation plans, the Corps and EPA should follow this practice with respect to the regulation itself. A notice-and-comment rulemaking is an arduous task, and the regulators in the field must be given some time to apply these new rules on the ground. As the agencies' experience with the new regulation grows, however, they must establish an effective feedback loop that informs agency headquarters about the progress, or lack thereof, in meeting the regulation's objectives. An EPA-formed external review panel could facilitate this function. The regulation should be evaluated regularly and adjusted (through a new notice-and-comment rulemaking for significant changes or guidance documents for minor modifications) in light of practical experience.
- *Renewed Emphasis on Avoidance and Minimization:* We reinforce the need for greater focus on avoidance and minimization, the first two steps of the mitigation sequence. With respect to minimization, perhaps an NRC committee or other group could be convened to develop minimization best practices for activities most related to wetland losses. The Environmental Law Institute has begun work in this area,¹⁶³ which could be expanded upon. Finally, despite progress on the compensatory mitigation front, we should not overlook the simplest and most straightforward contribution to the goal of no net loss of wetland functions—avoidance of impacts to high-quality and difficult-to-replace wetlands.

163. Env'tl. L. Inst., *The Federal Wetland Permitting Program: Avoidance and Minimization Requirements* (Env'tl. L. Inst. Mar. 2008) (available at http://www.elistore.org/reports_detail.asp?ID=11275); Env'tl. L. Inst., *State Wetland Permitting Programs: Avoidance and Minimization Requirements* (Env'tl. L. Inst. Mar. 2008) (available at http://www.elistore.org/reports_detail.asp?ID=11278).