

**A TRAINING COURSE FOR  
MITIGATION BANKING AND IN-LIEU FEE PROGRAM  
INTERAGENCY REVIEW TEAMS**



Reference Document:  
**Ecological Considerations for Mitigation Bank and In-Lieu Fee Program Site Selection and Design**

**A. Site Selection & Design Policy**

**2001 NRC Report: Compensating for Wetland Losses under the Clean Water Act**

- The committee concluded that such a preference for on-site and in-kind mitigation should not be automatic, but should follow from an analytically based assessment of the wetland needs in the watershed and the potential for the compensatory wetland to persist over time. (p. 4.)
- 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. (p. 4.)
- All mitigation wetlands should become self-sustaining. Proper placement in the landscape to establish hydrogeological equivalence is inherent to wetland sustainability. (pp. 4-5.)
- A mitigation site needs to have the ability to become self-sustaining. This means that the hydrological processes that define a wetland in the ecosystem need to be present and expected to persist in perpetuity. To aid regulators and mitigators in designing projects that will become ecologically self-sustaining, the committee offers 10 operational guidelines.

*Operational Guidelines for Creating or Restoring Self-Sustaining Wetlands*

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 over-engineered 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 wetland creation or restoration in seriously degraded or disturbed sites.
10. Conduct early monitoring as part of adaptive management. (pp 5-6.)

## **2003 Operational Guidelines for Creating or Restoring Self-Sustaining Wetlands**

Memorandum to the field issued by the Corps on October 29, 2003, which identifies the ten operational guidelines for planning and siting successful mitigation projects drawn directly from the NRC report (above).

### **2003 Model Compensatory Mitigation Plan Checklist**

- Mitigation Site Selection and Justification
  - Describe process of selecting proposed site
  - Likelihood of success, future land use compatibility, etc.

#### *3. Mitigation Site Selection & Justification*

- a. Site-specific objectives: Description of mitigation type(s),<sup>1</sup> acreage(s) and proposed compensation ratios.
- b. Watershed/regional objectives: Description of how the mitigation project will compensate for the functions identified in the Mitigation Goals section 1(c).
- c. Description of how the mitigation project will contribute to aquatic resource functions within the watershed or region (or sustain/protect existing watershed functions) identified in the Mitigation Goals section 1(d). How will the planned mitigation project contribute to landscape connectivity?
- d. Likely future adjacent land uses and compatibility (show on map or aerial photo).
- e. Description of site selection practicability in terms of cost, existing technology, and logistics.
- f. If the proposed mitigation is off-site and/or out-of-kind, explain why on-site or in-kind options<sup>2</sup> are not practicable or environmentally preferable.
- g. Existing and proposed mitigation site deed restrictions, easements and rights-of-way. Demonstrate how the existence of any such restriction will be addressed, particularly in the context of incompatible uses.
- h. Explanation of how the design is sustainable and self-maintaining. Show by means of a water budget that there is sufficient water available to sustain long-term wetland or stream hydrology. Provide evidence that a legally defensible, adequate and reliable source of water exists.
- i. USFWS and/or NOAA Fisheries Listed Species Clearance Letter or Biological Opinion.
- j. SHPO Cultural Resource Clearance Letter.

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<sup>1</sup> That is, restoration, enhancement, creation or preservation: see Regulatory Guidance Letter (RGL) 02-2, Mitigation RGL, for definitions for these terms.

<sup>2</sup> See Federal Guidance on the Use of Off-Site and Out-of-Kind Compensatory Mitigation under Section 404 of the CWA.

## B. Watershed Approach Policy

### 2008 Proposed Compensatory Mitigation Regulations

#### §332.3 General compensatory mitigation requirements

- (c) *Watershed approach to compensatory mitigation.*
  - (2) *Considerations.*
  - (3) *Information Needs.*
  - (4) *Watershed scale.*

### 2001 NRC Report: Compensating for Wetland Losses under the Clean Water Act

Generally, see pp. 140 – 149.

## C. Studies on the Effectiveness of Mitigation

### NATIONAL STUDIES:

1. Morgan, J and P. Hough, 'Compensatory Mitigation Performance: The State of the Science', *National Wetlands Newsletter*, 37 (2015), 9 p
2. Kihlslinger, R.L. 2008. Success of Wetland Mitigation Projects. *National Wetlands Newsletter*. 30(2): 14-16. Environmental Law Institute. 2006. The Status and Character of In-Lieu Fee Mitigation in the United States.
3. Environmental Law Institute. 2006. 2005 Status Report on Compensatory Mitigation
4. Government Accountability Office. 2005. Corps of Engineers Does Not Have an Effective Oversight Approach to Ensure that Compensatory Mitigation is Occurring.
5. IUCN. 2004. Biodiversity Offsets: Views, experience, and the business case.
6. Environmental Law Institute. 2002. Banks and Fees: The Status of Off-Site Wetland Mitigation in the United States.  
National Academy of Sciences. 2001. Compensating for Wetland Losses Under the Clean Water Act. <http://www.nap.edu/books/0309074320/html/>.
7. General Accounting Office. 2001. Wetlands Protection: Assessments Needed to Determine Effectiveness of In-Lieu-Fee Mitigation.
8. Ambrose, Richard F. 2000. "Wetland Mitigation in the United States: Assessing the Success of Mitigation Policies." *Wetlands (Australia)*. 19: 1-27.

[http://water.epa.gov/lawsregs/guidance/wetlands/upload/2004\\_10\\_28\\_wetlands\\_ambrose\\_wetlandmitigationinus.pdf](http://water.epa.gov/lawsregs/guidance/wetlands/upload/2004_10_28_wetlands_ambrose_wetlandmitigationinus.pdf).

### **REGIONAL STUDIES:**

1. Hill, T, E. Kulz, B. Munoz, J. Dorney. 2013. Compensatory stream and wetland mitigation in North Carolina: an evaluation of Regulatory success. *Environ. Manage.* 51:1077-1091.
2. Stefanik, K and W. Mitsch. 2012. Structural and Functional Vegetation Development in created and restored wetland mitigation banks of different ages. *Ecol. Engineering* 39: 104-112.
3. PG Environmental and Midwest Biodiversity Institute. 2012. Great Lakes Basin Evaluation of Compensation Sites Report. EPA Contract No. EP-R5-10-02.
4. Micacchion, M, B. Gara, and J Mack. 2010. Assessment of Mitigation Projects in Ohio. Volume 1: An ecological assessment of Ohio individual wetland mitigation projects. Ohio EPA Technical Report WET/2010-1A.
5. Florida Department of Environmental Protection. 2007. Report on Effectiveness of Mitigation Banking in Florida.
6. Ambrose, Richard F., John C. Callaway, and Steven F. Lee. 2006. An Evaluation of Compensatory Mitigation Projects Permitted Under Clean Water Act Section 401 by the California State Water Quality Control Board, 1991-2002. .
7. Ohio EPA. 2006. An Ecological Assessment of Ohio Mitigation Banks: Vegetation, Amphibians, Hydrology, and Soils. Ohio EPA Technical Report WET/2006-1.
8. Washington State Department of Ecology. 2005. Wetlands in Washington State Volume 1: A Synthesis of the Science. Publication #05-06-006.
9. Washington State Department of Ecology 2005. Wetlands in Washington State Volume 2: Guidance for Protecting and Managing Wetlands. Publication #05-06-008.
10. Minkin, Paul and Ruth Ladd. 2003. Success of Corps-Required Mitigation in New England. USACE New England District.
11. Cole, Charles Andrew and Deborah Shafer. 2002. *Section 404 Wetland Mitigation and Permit Success Criteria in Pennsylvania, USA, 1986-1999. Environmental Management.* 30(4): 508-515. No URL available.
12. Washington State Department of Ecology. 2000 and 2002. Washington State Wetland Mitigation Evaluation Study, Phase 1: Compliance and Phase 2: Evaluating Success.

**EVALUATIONS OF DIFFERENT ASPECTS OF MITIGATION:**

1. Center for Natural Lands Management. 2004. Natural Lands Management: 28 Case Studies.
2. New Jersey Department of Environmental Protection. Creating Indicators of Wetland Status (Quantity and Quality): Freshwater Wetland Mitigation in New Jersey.

**SELECT SITE LOCATION GUIDELINES:**

Norfolk District, U.S. Army Corps of Engineers. March 5, 2008. Virginia Off-site Mitigation Site Location Guidelines.

Washington State Department of Transportation. Preliminary Wetland Mitigation Site Selection Process” February 2008.

Washington State Department of Ecology and Seattle District Corps of Engineers  
“Selecting Wetland Mitigation Sites Using a Watershed Approach”

