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# BANKS AND FEES

## The Status of Off-Site Wetland Mitigation In the United States


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**Wildlands Mitigation Bank** in Placer County, CA, courtesy of Steve Morgan, CEO, Wildlands, Inc.
**Pennsylvania Wetland Replacement Project**, Philadelphia, PA, courtesy of Shelby Reisinger, Pennsylvania Department of Environmental Protection.


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## The Status of Off-Site Wetland Mitigation In the United States

By the Environmental Law Institute

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*Banks and Fees: The Status of Off-site Wetland Mitigation in the United States*


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# I. INTRODUCTION

## BACKGROUND: COMPENSATORY MITIGATION

Land development activities may adversely impact wetlands that are protected under federal, state, and local regulatory programs. Wetlands receive legal protection because they are a significant ecological resource and because they provide a variety of functions that are of value to humans, including water purification, flood storage, sediment trapping, wildlife habitat and groundwater recharge.[1]

Most conversions of wetlands through development activities require a federal or state government permit. Permits authorizing impacts to wetlands reflect a public policy that attempts to balance wetland protection with alternative land uses. Under several regulatory programs, including §404 of the federal Clean Water Act (CWA),[2] a regulatory agency may impose conditions upon its approval for the activities that would destroy or impact a wetland.[3] The agency may require the permittee to replace the lost wetland and its functions by substituting replacement wetlands. This process is called compensatory mitigation. **Compensatory mitigation** may be accomplished through the restoration, creation, enhancement, or preservation of wetlands.[4] Compensatory mitigation performed on or adjacent to the development site is referred to as on-site mitigation.

*"**Compensatory mitigation**, under Section 10/404, is the restoration, creation, enhancement, or in exceptional circumstances, preservation of wetlands and/or other aquatic resources for the purpose of compensating for unavoidable adverse impacts."*

Source: *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks.* 60 Fed. Reg. 228, 58605-58614. 1995.

In the past 20 years, several alternatives to on-site mitigation have arisen, including wetland mitigation banking, in-lieu-fee mitigation, and project-specific off-site mitigation. These are often referred to as off-site mitigation programs.

### METHODS OF COMPENSATORY MITIGATION

**Restoration**: Re-establishment of wetland and/or other aquatic resource characteristics and function(s) at a site where they have ceased to exist, or exist in substantially degraded state.

**Creation**: The establishment of a wetland or other aquatic resource where one did not formerly exist.

**Enhancement**:Activities conducted in existing wetlands or other aquatic resources that increase one or more aquatic functions.

**Preservation**: The protection of ecologically important wetlands or other aquatic resources in perpetuity through the implementation of appropriate legal and physical mechanisms. Preservation may include protection of upland areas adjacent to wetlands as necessary to ensure protection and/or enhancement of the aquatic ecosystem.

*Source: Federal Guidance for the Establishment, Use and Operation of Mitigation Banks. Federal Register, Vol. 60, No. 228. 58605-58614. Tuesday, November 28, 1995.*

## WETLAND MITIGATION BANKING

Permittee-responsible mitigation remains the dominant form of compensatory mitigation. In these cases, the permittee compensates for its own impacts either on- or off-site in a manner approved by the regulatory agency on a case-by-case basis. In contrast, wetland

[1] For a thorough discussion of wetland functions and values, see Mitsch, William J. and James G. Gosselink. *Wetlands.* New York: Van Nostrand Reinhold, 1993. 507-540.

[2] 42 U.S.C. §1344.

[3] Compensatory mitigation is also required by the Corps under §10 of the Rivers and Harbors Act, which authorizes the Corps to regulate dredging and filling activities in navigable waters. (33 U.S.C. §§403, 407). For more information on the history of the Rivers and Harbors Act, see Strand, Margaret N. *Wetlands Deskbook, 2nd Edition.* Washington DC: Environmental Law Institute, 1997.

[4] Although the "Federal Guidance for the Establishment, Use and Operation of Mitigation Banks" states that compensatory mitigation may be accomplished through the restoration, creation, enhancement, or in exceptional circumstances, preservation of wetlands, some states have been more restrictive and others less restrictive on what activities meet compensatory mitigation requirements. For example, Minnesota only allows restoration and creation, seven other states do not allow any preservation, and Louisiana allows preservation even in the absence of exceptional circumstances.

**COMPENSATORY MITIGATION MECHANISMS**

| | Location of mitigation | Responsible party |
|---|---|---|
| Permittee-responsible mitigation | | |
| Permit specific | On- or off-site | Permittee |
| Single-user mitigation bank | On- or off-site | Permittee |
| Third-party-responsible mitigation | | |
| Commercial mitigation bank | Off-site | Sponsor |
| In-lieu-fee | Off-site | Fee administrator |
| Cash donation (ad hoc in-lieu-fee) | Off-site | Conservation organization or government agency |

*Source: Adapted from National Research Council. Compensating for Wetland Losses Under the Clean Water Act. Washington, D.C.: National Academy Press, 2001.*

mitigation banking is the practice of restoring, creating, enhancing, or preserving off-site wetland areas to provide compensatory mitigation for authorized impacts to wetlands.[5] In the past ten years, wetland mitigation banking has thrived as a compensatory mitigation technique to mitigate for wetland impacts in the United States.[6] With wetland mitigation banking, an agency or organization, often not the permittee, establishes larger off-site wetland areas that are used to mitigate for a number of smaller independently permitted wetland conversions. The permittees are released of their obligations to produce the compensatory wetland functions and instead can purchase them from the entity that, in most cases, has produced and "banked" them for this purpose. The banked "compensation credits" are recognized by the regulatory agency as providing suitable compensation for wetland impacts (see section IV. "Credit release"). Because, in theory, banks are established prior to the occurrence of permitted impacts, there is a reduced temporal loss of wetland acreage or functions.

For the most part, the U.S. Army Corps of Engineers (Corps) oversees wetland mitigation banking for federal CWA purposes in conjunction with other federal, state, and local regulatory programs. In some circumstances, state or local agencies oversee wetland mitigation banking programs directly with little or no oversight by the Corps.

## IN-LIEU-FEE MITIGATION

In-lieu-fee mitigation is a method for satisfying compensatory wetland mitigation requirements. With in-lieu-fee programs, project applicants agree to contribute mitigation fees to an approved third party that will use these funds to implement the required compensation. In-lieu-fee mitigation is similar to wetland mitigation banking in that they both provide consolidated, off-site mitigation for multiple permit recipients. However, wetland mitigation banking provides compensatory mitigation in advance of authorized impacts, in theory in-lieu-fee mitigation does not generally offer this benefit,[7] and under in-lieu-fee, mitigation funds are collected in advance of permitted impacts, but the funds may not be used to compensate for permitted losses for some time, i.e., until sufficient funds are collected to plan, design, and implement a wetland mitigation project. In-lieu-fee mitigation can, however, be used to restore a variety of wetland types of varying sizes at a number of locations, while mitigation banks frequently consolidate numerous wetland impacts into one large site. Until 2001, there were no standards governing approval or use of in-lieu-fee programs.

## ELI'S STUDY OF BANKS AND FEES

This study builds on the Environmental Law Institute's (ELI) 1993 report *Wetland Mitigation Banking*, which remains the only comprehensive publication to catalog and examine mitigation banks in the United States.[8] Data up to June 1992 was analyzed in the first ELI study. Much has changed in the intervening years. Federal guidance, federal legislation, and state policies and legislation, have since clarified the procedures as-

[5] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995 [hereinafter 1995 Banking Guidance].

[6] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act.* Washington, D.C.: National Academy Press, 2001. 83 [hereinafter NRC].

[7] Scodari and Shabman. *Review and Analysis of In Lieu Fee Mitigation in the CWA Section 404 Permit Program.* Alexandria, VA: Institute for Water Resources, U.S. Army Corps of Engineers, November 2000.

[8] ELI's 1993 report was part of the National Wetland Mitigation Banking Study. The U.S. Army Corps of Engineers, Institute for Water Resources conducted the study in the early and mid-1990s. The findings were presented in a series of reports on various aspects of wetland mitigation banking. For additional information, see <http://www.iwr.usace.army.mil/iwr/Regulatory/regulintro.htm>.

> ***Mitigation banking*** *is "wetlands restoration, creation, enhancement, and in exceptional circumstances, preservation undertaken expressly for the purpose of compensating for unavoidable wetland losses in advance of development actions, when such compensation cannot be achieved at the development site or would not be as environmentally beneficial."*
>
> Source: Federal Guidance for the Establishment, Use and Operation of Mitigation Banks. 60 Fed. Reg. 228, 58605-58614. 1995.

sociated with establishing banks and have occasionally promoted the use of wetland mitigation banking over the use of in-lieu-fee mitigation. In turn, these official endorsements have spawned a proliferation of banks sponsored not only by state and local government agencies, but by private sector entrepreneurs as well. Over the past 10 years, in-lieu-fee mitigation has also arisen as a more readily available option for permittees to satisfy compensatory mitigation requirements. Recent federal in-lieu-fee mitigation guidance will undoubtedly have a significant impact on this mitigation option.[9]

While wetland mitigation banking activity has expanded dramatically in the past 10 years, no comprehensive analysis of this activity has been conducted since 1992. A report by the General Accounting Office (GAO) issued in 2001[10] surveyed the in-lieu-fee programs sponsored by the Corps, but did not look at those programs sponsored by other entities. As a result, federal, state, and local policymakers, conservationists, the regulated community, and the public lack the ability to assess the impacts of wetland mitigation banking and in-lieu-fee mitigation on the status of the nation's wetlands.

This study was designed to determine the extent and nature of wetland mitigation banking and in-lieu-fee mitigation activities in the nation. It examines all wetland mitigation banks now in operation, as well as many proposed banks and newly emerging banking approaches, such as umbrella banks. It looks at mitigation banks recognized by the Corps, state agencies, and local governments. The study analyzes the in-lieu-fee programs currently administered by the Corps, states, and local governments. It summarizes existing state and local guidance and legislation that relate to wetland mitigation banking and in-lieu-fee mitigation. The study is intended to provide citizen groups and local, state, and federal agencies, the public, and the regulated community with the information they need to evaluate the ability of wetland mitigation banking and in-lieu-fee mitigation to achieve their regional wetland conservation and land use planning objectives.

> *"**'In-lieu-fee' mitigation** occurs in circumstances 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."*
>
> Source: U.S. Department of the Army, U.S. Environmental Protection Agency, U.S. Department of Interior, and U.S. Department of Commerce. *Federal Guidance on the Use of In-Lieu-Fee Arrangements for Compensatory Mitigation under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.* 2000.

## STUDY METHODOLOGY

ELI identified existing and proposed wetland mitigation banks, umbrella banks, and in-lieu-fee programs using published and unpublished research, surveys, and interviews. Interviews were conducted with the 38 Corps district offices. These interviews were supplemented by discussions with state wetland managers in all 50 states, other relevant regulatory agencies, in-lieu-fee sponsors, and in a limited number of cases, bank sponsors. The list of approved and pending mitigation banks and umbrella banks (see Appendix C) was verified by Corps districts and state wetland regulatory programs in November and December 2001.

The majority of the information analyzed was based on banking instruments, bank permits, and in-lieu-fee agreements. Published and unpublished research, and interviews with key experts on wetland compensatory mitigation were also valuable resources. Relevant documents were obtained for all existing and proposed banks

[9] U.S. Department of the Army, U.S. Environmental Protection Agency, U.S. Department of Interior, and U.S. Department of Commerce. *Federal Guidance on the Use of In-Lieu-Fee Arrangements for Compensatory Mitigation under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.* 2000 [hereinafter 2000 In-lieu-fee Guidance].

[10] United States General Accounting Office. *Wetlands Protection: Assessments Needed to Determine Effectiveness of In-Lieu Fee Mitigation.* GAO-01-325. May 4, 2001 [hereinafter GAO].

and on all approved in-lieu-fee programs.[11] In general, authorizing instruments or banking instruments were collected for each verified approved wetland mitigation bank and in-lieu-fee program. In some instances, additional information, such as permits, bank plans, supplements to bank instruments, financial information, and correspondence were collected. Federal, state, and local laws, regulations, and guidance related to mitigation banking and in-lieu-fee programs across the country were also identified and examined.

Although this study collected and analyzed a large amount of information on wetland mitigation banking and in-lieu-fee mitigation, certain important aspects of these compensatory mitigation approaches could not be addressed by examining authorizing instruments. In addition, although many of the report's findings and conclusions do apply to mitigation banks and in-lieu-fee programs on the whole, they cannot necessarily be used to make assumptions about the relative success or failure of any individual bank or in-lieu-fee project.

The compiled data on wetland mitigation banks, umbrella banks, and in-lieu-fee programs is also available in a comprehensive database "WetlandBank," available through ELI's web site (http://www2.eli.org/wmb/index.html). The database includes detailed information collected during the study searchable by a variety of criteria.

[11] Authorizing instruments were not available for the following banks: Cheval Tournament Players Club, FL; Hillsborough County Utilities Department Mitigation Bank, FL; Northlakes Park Mitigation Bank, FL; Polk Parkway Bank, FL; Polk Regional Drainage Project Bank, FL; Southeast Mitigation Bank, FL; Turner Citrus, Inc., FL; Marion I Sustainable Mitigation Project, FL; Winfield Creek Mitigation Bank (DuPage County), IL; Downers Grove Mitigation Bank (DuPage County), IL; North Glen Ellyn Mitigation Bank (DuPage County), IL; Knollwood Mitigation Bank (DuPage County), IL. Cornerstone Mitigation Bank (DuPage County), IL. Authorizing instruments were not available for the following in-lieu-fee programs: Louisville and Jefferson County Metropolitan Sewer District, Kentucky; Northern Kentucky University, Kentucky; the 27 programs administered by the Buffalo Corps district; Ducks Unlimited, ID; The Nature Conservancy, ID.

# II. THE REGULATORY CONTEXT FOR WETLAND MITIGATION BANKING

## THE CLEAN WATER ACT

The primary source of federal regulatory jurisdiction over wetlands is the Federal Water Pollution Control Act, or the Clean Water Act[12] The CWA was established to restore and maintain the chemical, physical, and biological integrity of the nation's waters, including wetlands. The CWA section that established the wetlands regulatory program, §404, was enacted in 1972. Since that time, §404 has evolved into the major federal program regulating activities to the nation's aquatic resources, including wetlands.

Section 404 regulates "discharges" of "dredged or fill material" to waters of the United States, including wetlands. Corps' regulations define wetlands as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."[13]

Several types of activities, such as normal, on-going farming, ranching, and silviculture activities, are exempt from regulation under §404(f) of the CWA unless they convert a wetland to a new use and impair the flow or circulation of waters of the United States or reduce the reach of such waters.

Because of the historical role played by the Corps in regulating dredging and other activities in navigable waters, Congress assigned the agency primary responsibility for administering the §404 permitting program. The Corps has the authority to issue individual permits or general permits under §404(e). General permits are intended to be issued for categories of activities that are similar in nature and are determined to have only minimal adverse environmental impacts. Individuals or organizations wishing to fill a wetland must first obtain authorization from the Corps.

Although the Corps plays the lead role in regulating wetlands, the U.S. Environmental Protection Agency (EPA) is responsible for establishing the environmental guidelines (or §404(b)(1) guidelines) that the Corps must use to evaluate the impact of proposed projects when making permit determinations. EPA also has the authority to veto permits approved by the Corps under §404(c). Other federal agencies, such as the U.S. Fish and Wildlife Service (FWS), Natural Resources Conservation Service (NRCS), and the National Marine Fisheries Service (NMFS), have the opportunity to review and comment upon Corps permit decisions. Under §404(q), EPA, FWS, and NMFS have the ability to "elevate" disputes over specific proposed permits and general policy matters, but they do not have the veto authority of EPA.

### Alternatives analysis

The §404(b)(1) guidelines, or environmental guidelines, established by EPA were finalized in 1980.[14] Under these binding rules,[15] all wetlands are considered "special aquatic sites."[16] The §404(b)(1) guidelines set in motion the process—referred to as the "practical alternatives analysis"—that the Corps must undertake before issuing a §404 permit to fill a wetland. The §404(b)(1) guidelines dictate that the Corps requires applicants to provide documentation that there are no practicable alternatives to the proposed project. In other words, a permit cannot be issued if there is a "practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences."[17] An alternative is considered practicable after taking into consideration "cost, existing technology, and logistics in light of over-

[12] Federal Water Pollution Control Act, 33 U.S.C. §§1251-1387.
[13] 33 C.F.R. §328.3(b) (2001). *See also* 40 C.F.R. §§230.3(t), 232.2 (2001).
[14] 40 C.F.R. §230. See <http://www.epa.gov/OWOW/wetlands/regs.html>.
[15] Strand, Margaret N. *Wetlands Deskbook, 2nd Edition*. Washington DC: Environmental Law Institute, 1997. 41.
[16] 40 C.F.R. §230.41.
[17] 40 C.F.R. §230.10(a).

### THE HISTORY OF THE MITIGATION MOA

In addition to the Corps and EPA regulations, the 1990 MOA was influenced by several important federal policies. First, the **Fish and Wildlife Coordination Act**,[21] originally passed in 1934 (and strengthened by subsequent amendments in 1946, 1958, and 1965) requires mitigation for habitat loss. The act applies to both congressionally authorized and federally permitted "water resource development projects," and specifically to issuance of §404 permits. It requires the Corps to "consult" the FWS and NMFS and to consider their recommendations for avoiding or compensating for habitat loss, but it does not require the Corps to adopt those recommendations.

Second, in 1978, the Council on Environmental Quality (CEQ) published regulations, binding on all federal agencies, which spell out the procedures required to implement the **National Environmental Policy Act** (NEPA), including mitigation responsibilities.[22] CEQ is the White House office established to oversee the government's obligations under NEPA. The CEQ regulations state that mitigation includes:

1) Avoiding the impact altogether by not taking a certain action or parts of an action.
2) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
3) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
4) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
5) Compensating for the impact by replacing or providing substitute resources or environments.[23]

The third federal policy to influence the 1990 MOA is the "no net loss" policy. In the late 1980s, the Conservation Foundation and EPA convened the National Wetland Policy Forum to formulate policy recommendations for guiding protection of the nation's wetlands. In 1988, the National Wetland Policy Forum released its report, "Protecting America's Wetlands – An Action Agenda." The report states that wetlands policy should strive "to achieve no overall net loss of the nation's remaining wetlands base and to create and restore wetlands, where feasible, to increase the quantity and quality of the nation's wetland resource base." The no net loss policy has become the guiding principle for much of the federal wetlands program.[24]

Seeking to resolve long-standing questions about mitigation policy, EPA and the Corps drew from existing regulations and policy in developing the 1990 mitigation MOA. The MOA states that for wetlands, the Corps will "strive to achieve a goal of no overall net loss of values and functions."[25]

all project purposes."[18] The guidelines also provide that proposed projects may not be permitted unless "appropriate and practicable steps have been taken which will minimize potential adverse impacts of the discharge on the aquatic ecosystem."[19]

[18] 40 C.F.R. §230 10(a)(2).
[19] 40 C.F.R. §230.10(d).

## 1990 Army-EPA mitigation memorandum of agreement

In 1990, the Department of the Army and EPA entered into a Memorandum of Agreement (MOA) that clarifies the protocol for determining the type and level of mitigation required under the §404(b)(1) guidelines ("mitigation MOA" or "1990 MOA").[20] This MOA has had a significant impact on the §404 permitting process.

The 1990 mitigation MOA was developed to clarify the "appropriate and practicable measures" required to offset unavoidable impacts permitted through the §404 regulatory program. Under the MOA, the agencies established a three-part process—or **sequencing guidelines**—to help guide compensatory mitigation decisions. It is important to note that the mitigation MOA applies only to individual, or "standard" permits, not general permits (i.e., regional permits, nationwide permits, or programmatic permits).[26] As many as 85 percent of all §404 projects authorized by the Corps in the waters of the United States are approved under a general permit.[27] The sequencing steps are:

**1. Avoid**—This step is in accordance with the alternatives analysis established by the §404(b)(1) guidelines, which allows permits for only the least environmentally damaging practicable alternatives. It restates, "no discharge shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact to the aquatic ecosystem."[28]

[20] U.S. Environmental Protection Agency and U.S. Department of the Army. *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*. 1990. See <http://www.epa.gov/OWOW/wetlands/regs.html>.
[21] 16 U.S.C. §§661-6673 (1976).
[22] 40 C.F.R. §§1500-1508.
[23] 40 C.F.R. §§1508.20.
[24] <http://www.epa.gov/owow/monitoring/volunteer/spring98/pg06.html>.
[25] U.S. Environmental Protection Agency and U.S. Department of the Army. *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*. 1990. II.B.
[26] See Mitsch, William J. and James G. Gosselink. *Wetlands*. New York: Van Nostrand Reinhold, 1993. 507-540.
[27] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act*. Washington, D.C.: National Academy Press, 2001. 66.
[28] U.S. Environmental Protection Agency and U.S. Department of the Army. *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*. 1990. II.C (1).

*The 1990 mitigation MOA was developed to clarify the "policy and procedures to be used in the determination of the type and level of mitigation necessary to demonstrate compliance with the Clean Water Act (CWA) Section 404(b)(1) Guidelines."*

Source: U.S. Environmental Protection Agency and U.S. Department of the Army. *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.* 1990.

**2. Minimize**—If impacts cannot be avoided, steps must be taken to minimize the adverse impacts through project modifications and permit conditions.[29]

**3. Mitigate**—The final step in sequencing, the Corps is required to determine "appropriate and practicable compensatory mitigation for unavoidable adverse impacts which remain after all appropriate and practicable minimization has been required."[30]

Therefore, before a §404 permit can be issued, the Corps must determine if there is a practicable alternative that avoids impacts to wetlands. If unavoidable, impacts must be minimized. Finally, any resulting unavoidable impacts must then be mitigated. The 1990 MOA also clarified the role of wetland mitigation banking as an acceptable form of compensatory mitigation. In a brief nod to the then new practice of wetland mitigation banking, the MOA states "[m]itigation banking may be an acceptable form of compensatory mitigation under specific criteria designed to ensure an environmentally successful bank."[31]

## 1995 FEDERAL BANKING GUIDANCE

Although the 1990 mitigation MOA established the legitimacy of wetland mitigation banking, the practice was not commonplace in the early 1990s because of high costs and regulatory uncertainty. In 1992 there were 46 wetland mitigation banks in the country. At that time, banks existed in only 17 states. Eleven were located in California and eight in Florida. In 1992, only six banks were controlled by private developers and only one of these—Fina LaTerre in Louisiana—offered credits for commercial sale to the general public.[32]

In an effort to clarify the manner in which mitigation banks could be used to satisfy the mitigation requirements of the CWA §404 program, the Corps, EPA, FWS, NRCS, and National Oceanic and Atmospheric Administration (NOAA), published "Federal Guidance for the Establishment, Use and Operation of Mitigation Banks" in the Federal Register in November 1995 ("banking guidance" or "1995 guidance").[33] The 1995 guidance reinforced many provisions outlined in a 1993 Regulatory Guidance Letter signed by the Corps and EPA, which offered interim guidance on wetland mitigation banking.[34]

The 1995 banking guidance defines mitigation banking as "the restoration, creation, enhancement and, in exceptional circumstances, preservation of wetlands and/or other aquatic resources expressly for the purpose of providing compensatory mitigation in advance of authorized impacts to similar resources." Mitigation banking is authorized for use when "on-site compensation is either not practicable or use of a mitigation bank is environmentally preferable to on-site compensation."

*The 1995 banking guidance was developed to "clarify the manner in which mitigation banks may be used to satisfy mitigation requirements of the Clean Water Act Section 404 permit program and the wetland conservation provisions of the Food Security Act."*

Source: Federal Guidance for the Establishment, Use and Operation of Mitigation Banks. 60 Fed. Reg. 228, 58605-58614. 1995.

The 1995 banking guidance lists several advantages of mitigation banking over individual mitigation projects, such as the ability of banks to:

1. Consolidate compensatory mitigation into a single large parcel or contiguous parcels;
2. Bring together financial resources, planning, and scientific expertise not practicable to many project-

[29] 40 C.F.R. §230.10(d); U.S. Environmental Protection Agency and U.S. Department of the Army. *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.* 1990. II.C (2).

[30] U.S. Environmental Protection Agency and U.S. Department of the Army. *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.* 1990. II.C (3).

[31] *Id.*

[32] *Wetland Mitigation Banking.* Washington, D.C.: Environmental Law Institute, 1993.

[33] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks.* 60 Fed. Reg. 228, 58605-58614. 1995.

[34] U.S. Army Corps of Engineers and U.S. Environmental Protection Agency. *Regulatory Guidance Letter No. 93-2.* "Memorandum to the Field. Subject: Establishment and Use of Wetland Mitigation Banks in the Clean Water Act Section 404 Regulatory Program." Washington, D.C. August 23, 1993.

specific compensatory mitigation proposals;
3. Reduce permit processing times and provide more cost-effective compensatory mitigation opportunities;
4. Implement and function in advance of project impacts, thereby reducing temporal losses of aquatic functions and uncertainty over whether the mitigation will be successful in offsetting project impacts;
5. Increase the efficiency of limited agency resources in the review and compliance monitoring of mitigation projects because of consolidation, and thus improving the reliability of efforts to restore, create, or enhance wetlands for mitigation purposes; and
6. Contribute towards attainment of the goal for no overall net loss of wetlands by providing opportunities to compensate for authorized impacts when mitigation might not otherwise be appropriate or practicable.[35]

The 1995 guidance was a milestone in institutionalizing the practice of wetland mitigation banking. The guidance gave state agencies, local governments, and the private sector the regulatory certainty and procedural framework they needed to move forward on seeking approval for mitigation banks. Following its issuance, the number of banks across the country proliferated and entrepreneurial mitigation banks became a mainstream option, rather than a novelty.

## CORPS REGULATORY GUIDANCE LETTER AND FEDERAL RESPONSE TO THE NATIONAL RESEARCH COUNCIL

In June 2001, the National Research Council (NRC) released its report, *Compensating for Wetland Losses Under the Clean Water Act.*[36] The two-year study was initiated in response to the Clinton Administration's Clean Water Action Plan, which called for a review of the effectiveness of compensatory mitigation and an evaluation of whether the national no net loss goal was being achieved in the §404 regulatory program. Among other charges, the NRC Committee on Mitigating Wetland Losses was asked to evaluate the ability of wetland restoration, enhancement, creation, and in-lieu-fee mitigation to adequately restore wetland functions and to evaluate options for improving the ecological effectiveness of wetland mitigation. The report offers 26 recommendations for improving the ecological effectiveness of federally required compensatory mitigation.

In response to the NRC study and in light of ten years of operation under the 1990 mitigation MOA, the Corps released a Regulatory Guidance Letter (RGL) addressing compensatory mitigation on October 31, 2001.[37] The RGL was to build on the recommendations in the NRC report to require "more stringent standards for mitigating impacts to the aquatic ecosystem, including wetlands."[38]

If implemented, the RGL would relax the agency's preference for on-site and in-kind mitigation.[39] In several areas the RGL would promote mitigation of wetland impacts with non-wetland habitats. It would allow credits to be assigned for the inclusion of upland areas in a compensatory mitigation project[40] and would allow for the establishment of vegetated buffers in or near streams or other open waters as the sole compensatory mitigation activity (even if the buffers are uplands).[41] The RGL moves away from the clear preference given to restoration over other forms of compensatory mitigation highlighted in the 1995 guidance[42] and states that wetland preservation "may be authorized as the sole basis for generating credits in mitigation projects."[43]

In the spirit of interagency cooperation and, in part, due to EPA's role in the wetland program established under the CWA,[44] past policy changes affecting compensatory mitigation were made through lengthy inter-

[35] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995.

[36] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act*. Washington, D.C.: National Academy Press, 2001. *See* <http://www.nap.edu/books/0309074320/html/>.

[37] U.S. Army Corps of Engineers. *Regulatory Guidance Letter, No. 01-1.* "Guidance for the Establishment and Maintenance of Compensatory Mitigation Projects Under the Corps Regulatory Program Pursuant to Section 404(a) of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899." Washington, D.C.: U.S. Army Corps of Engineers. October 31, 2001. See <http://www.usace.army.mil/inet/functions/cw/cecwo/reg/rglsindx.htm>.

[38] U.S. Army Corps of Engineers. *U.S. Army Corps of Engineers issues new regulatory guidance*. News Release, No. PA-01-13. See <http://www.usace.army.mil/civilworks/hot_topics/rgl_release.pdf>.

[39] U.S. Army Corps of Engineers. *Regulatory Guidance Letter, No. 01-1.* "Guidance for the Establishment and Maintenance of Compensatory Mitigation Projects Under the Corps Regulatory Program Pursuant to Section 404(a) of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899." Washington, D.C.: U.S. Army Corps of Engineers. October 31, 2001. 2(e).

[40] *Id.* at 2(c).

[41] *Id.* at 2(d).

[42] *Id.* at 2(g).

[43] *Id.* at 2(b).

[44] Under §404 (§404(b)(1) guidelines) of the CWA, EPA is charged with acting as the lead agency in the development of environmental criteria used to evaluate permit applications under §404.

agency efforts.[45] Following a flurry of complaints from its sister wetland regulatory agencies, environmental groups, and Congress, in December 2001, the Corps opened the regulatory guidance letter for comment by other federal agencies.[46]

Since March 2002, an interagency workgroup including EPA, FWS, and NMFS, has been working with the Corps to address concerns about the RGL. It is anticipated that the Corps will incorporate many of the agencies' recommendations in revised guidance to the field. In addition, an interagency group has been working to develop a comprehensive response to many of the deficiencies identified in recent evaluations of compensatory mitigation, including the NRC report and a 2001 report by the GAO on in-lieu-fee mitigation.[47] The interagency group is identifying specific tasks that the agencies will complete jointly over the next three years to address key weaknesses in the federal compensatory mitigation program.

## FOOD SECURITY ACT

Under the 1985 Food Security Act, Congress enacted a new program—Wetlands Conservation Compliance, or Swampbuster—that can also require mitigation for some agricultural activities affecting wetlands. Under Swampbuster, farmers become ineligible for certain federal farm program benefits, such as price support or payment and loans, if they fill a wetland to plant commodity crops.[48] The NRCS, the arm of the U.S. Department of Agriculture (USDA) that monitors compliance with Swampbuster, may allow mitigation as part of a farmer's effort to comply with the program. Under the program, mitigation requirements may be satisfied through "restoration, enhancement, or creation as long as wetland functions are maintained."[49] Swampbuster requires that the mitigation site be in the same general area of the local watershed as the converted wetlands, which includes regional mitigation banks.[50] Because Swampbuster and §404 cover different activities on agricultural lands, some actions that fall under Swampbuster may not fall under §404 jurisdiction and *vice versa*.[51]

## MITIGATION BANKING UNDER THE FEDERAL HIGHWAY ADMINISTRATION

Wetland mitigation legislation and policies developed by the Federal Highway Administration (FHWA) have been promoting wetland mitigation banking since the early 1990s. The majority of the nation's early wetland mitigation banks were single-user banks established by state departments of transportation. In 1992, nearly half of the existing banks were state highway banks.[52]

In 1991, Congress passed the Intermodal Surface Transportation Efficiency Act (ISTEA), which included a provision that made the costs of wetland mitigation banks established as compensatory mitigation for impacts due to federal aid highway projects eligible for federal aid highway funds.[53] In 1996, the FHWA revised its no net loss of wetlands policy by establishing a goal of replacing 1.5 acres of wetlands for every acre impacted under the federal-aid highway program.[54] To measure whether or not this goal is being met, the FHWA compiles information from field offices on the area of wetlands impacted to the area of wetlands provided through compensatory wetland mitigation. In fiscal year 2001, the FHWA reported "on a program-wide basis…federal-aid highway projects provided 2.11 acres of compensatory wetland mitigation for each acre of impact."[55]

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[45] The 1990 mitigation MOA was signed by both the Department of the Army and EPA. The 1995 banking guidance was signed by both agencies, as well as the FWS, NRCS, and NOAA. In 2000, EPA, the Corps, FWS, and NOAA issued joint guidance on in-lieu-fee mitigation. Development of the 1995 mitigation banking guidance also included a solicitation for public comment on the proposed changes. *See also* Gardner, Royal C. "Corps' New Regulatory Guidance Letter on Mitigation: Trick or Treat?" *National Wetlands Newsletter*. 24:2 (2002): 3.

[46] See < http://www.usace.army.mil/inet/functions/cw/hot_topics/fedagcycomment.htm>.

[47] United States General Accounting Office. *Wetlands Protection: Assessments Needed to Determine Effectiveness of In-Lieu Fee Mitigation.* GAO-01-325. May 4, 2001.

[48] 16 U.S.C. §3821 *et seq.;* Strand, Margaret. *Wetlands Deskbook, 2nd Edition.* Washington, D.C.: Environmental Law Institute, 1997. 73.

[49] *Fact Sheet – Mitigation.* Natural Resources Conservation Service. 6 May 2002. <http://www.nrcs.usda.gov/programs/wetlands/>.

[50] *Id.*

[51] Zinn, Jeffrey. *Wetland Mitigation Banking: Status and Prospects.* Washington: D.C.: Congressional Research Service, 1997.

[52] *Wetland Mitigation Banking*. Washington, D.C.: Environmental Law Institute, 1993.

[53] Strand, Margaret N. *Wetlands Deskbook, 2nd Edition*. Washington DC: Environmental Law Institute, 1997. See Intermodal Surface Transportation Efficiency Ac of 1991, Pub. L. No. 102-240, 105 Stat. 1914 (1991).

[54] Slater, Rodney E. Memorandum to Regional Administrators. "Results of the 1996 Performance Agreement on the Protection of Wetlands and Water Quality." 13 November 1996; Bank, Fred and Paul Garrett. "Federal Aid Highway Program and Wetlands Mitigation." *Roadsides*. 8:5 (2001).

[55] *Wetlands Mitigation Data Report for Federal-Aid Highway Projects Fiscal Year 2001*. Federal Highway Administration. May 17, 2002. <http://www.fhwa.dot.gov/environment/wetland/mitrpt01.htm>.

Building on ISTEA, Congress passed the Transportation Equity Act for the 21st Century (TEA-21) in 1998.[56] Under TEA-21, the costs of wetland and habitat mitigation projects established as mitigation for impacts due to federal aid highway projects are eligible for federal aid highway funds.[57] In 2000, FHWA clarified this provision, establishing that "under current law Federal-aid funds may be used to improve or restore wetlands affected by past Federal-aid highway projects, even when no current Federal-aid project is taking place in the vicinity."[58] In other words, federal highway funds can be used to restore, conserve, enhance, and create wetlands as mitigation for past wetland impacts due to federal aid highway projects, even if there are currently no wetland-impacting highway projects underway in the immediate area.[59]

TEA-21 and subsequent regulations also establish a preference for using mitigation banks to compensate for impacts due to highway projects if the impacts are within the service area of the bank. The bank must have available sufficient credits to offset the impacts, be approved in agreement with the 1995 banking guidance, and the use of the bank must be in accordance with all applicable federal laws and regulations.[60]

As a result of TEA-21 and agency guidance, federal aid highway projects give greater preference to the use of mitigation banks than does the 1995 banking guidance. FHWA policy will continue to promote the development and use of wetland mitigation banks across the county.

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[56] Pub. L. 105-178 (1998)

[57] Pub. L. 105-178 Sec. 1106(b)(6)(M), *amending* 23 U.S.C. §103; Pub. L. 105-178 Sec. 1108(a)(6)(B), *amending* 23 U.S.C. §133(b)(11).

[58] *Mitigation of Impacts to Wetlands and Natural Habitat.* 65 Fed. Reg. 251, 82913-82926. 2000.

[59] *Id.*

[60] Pub. L. 105-178 Sec. 1108(a)(6)(B), *amending* 23 U.S.C. §133(b)(11); *Mitigation of Impacts to Wetlands and Natural Habitat.* 65 Fed. Reg. 251, 82913-82926. 2000.

# III. BANK ORGANIZATION AND PLANNING CONSIDERATIONS

Wetland mitigation banking arises from the need of public or private developers who have received a permit from the Corps or a state or local regulatory program to compensate for impacts to regulated wetlands, and the corresponding need for state and federal regulatory agencies to ensure that impacts to wetlands receive compensation. Prior to the issuance of the 1995 banking guidance, decisions relating to the organizational, administrative, and structural aspects of the establishment and functioning of mitigation banks was primarily done ad hoc. State departments of transportation often entered into memoranda of understanding with state and federal agencies that allowed for the mitigation of permitted impacts off-site and in advance of impacts.

The 1990 mitigation MOA and the 1995 banking guidance provide clarity about the location and type of compensatory mitigation that is required for permitted impacts to wetlands. The 1995 banking guidance further outlines the governance structure that guides the planning and establishment of banks, criteria for use of a bank, and long-term bank management and monitoring.

## DETERMINING APPROPRIATE MITIGATION

When a project is proposed that will cause impacts to wetlands, the Corps is responsible for determining the appropriate form of mitigation that is required. A state regulatory agency may be responsible when the affected wetlands are not protected under §404, the state has its own wetlands regulations, or the state is administering §404 under a delegated or programmatic permit. All activities regulated under §404 of the CWA and §10 of the Rivers and Harbors Act are eligible to use a mitigation bank to compensate for permitted impacts to wetlands or other aquatic resources.[61]

### Where mitigation should occur: on-site vs. off-site mitigation

The 1990 MOA establishes a process for determining the most appropriate mitigation that should be required of a permittee. It states that compensatory mitigation should be undertaken in areas adjacent or contiguous to the discharge site, otherwise known as "on-site mitigation." If on-site mitigation is determined impracticable, off-site compensatory mitigation should be undertaken in the same geographic area, if possible.[62] The 1995 banking guidance clarifies the agencies' position on when off-site mitigation should be used over on-site mitigation. Because the federal regulatory agencies felt that an undue preference for on-site mitigation often led to the creation of many small wetlands in developed areas, some of which failed, the 1995 guidance states that banks should be used when they are "environmentally preferable" to on-site compensation. In addition, it established that the relative cost of mitigation alternatives could be considered. Most significantly, the 1995 banking guidance states that the "use of a mitigation bank to compensate for minor aquatic resource impacts (e.g., numerous, small impacts associated with linear projects; impacts authorized under nationwide permits) is preferable to on-site mitigation."[63] In essence, the 1990 MOA and the 1995 banking guidance establish a preference for using off-site mitigation in the form of mitigation banking to compensate for impacts to small wetlands and when off-site mitigation is deemed environmentally preferable to on-site mitigation.

### Choosing wetland mitigation banking

When the Corps issues a permit that will cause impacts to wetlands, the agency may indicate the most

[61] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995.

[62] U.S. Environmental Protection Agency and U.S. Department of the Army. *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*. 1990. II.C (3).

[63] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995. II. D (4).

environmentally preferable method for the permittee to compensate for those impacts as a special condition of the authorization. If the permitted impacts occur within the service area of an approved and active wetland mitigation bank, the Corps may allow the permittee's mitigation obligations to be served by purchasing credits from that bank. The agency must also determine the number of wetland mitigation bank credits required to compensate for the proposed impacts (see section IV. "Wetland types available for crediting").

***In-kind compensation*** *is restoration, creation, enhancement or preservation of wetlands similar to those being impacted.* ***Out-of-kind compensation*** *is restoration, creation, enhancement, or preservation of wetlands that provide different functions than those of wetlands being adversely affected by a project.*

Source: National Research Council. 2001. *Compensating for Wetland Losses Under the Clean Water Act.* Washington, DC: National Academy Press.

## IN-KIND VS. OUT-OF-KIND MITIGATION

The 1990 MOA states a clear preference for in-kind compensatory mitigation (replacing forested wetlands with forested wetlands) over out-of-kind mitigation (replacing forested wetlands with open water wetlands). The 1995 guidance supports the preference for in-kind compensation, however it allows for the use of out-of-kind compensation when it is determined to be "practicable and environmentally preferable to in-kind compensation."[64] One exception is made for out-of-kind mitigation; non-tidal wetlands should not be used to compensate for the loss of tidal wetlands.[65]

The ability of wetland resource agencies to realistically assess whether proposed mitigation meets the definition of in-kind or out-of-kind compensation will depend on the type of wetland classification used. Wetland classifications that lump wetland types into broad categories will make meeting in-kind requirements easier. Although the Cowardin classification system, which outlines a hierarchical system to classify wetland types, has been adopted in many parts of the country, it is not consistently used (see section IV. "Wetland types available for crediting").[66] However, the Corps has been moving toward use of the Hydrogeomorphic Classification system, which uses functional classes to identify wetland types.[67]

## MITIGATION METHODS

Although 1995 guidance states that mitigation banks can be established through the "restoration, creation, enhancement, and in exceptional circumstances, preservation"[68] of wetlands, it makes it clear that restoration should be the first option for establishing a bank. Restoration is favored since, presumably, the correct hydrologic conditions are either in place or easily restorable. The 1995 guidance states, "restoration should be the first option considered when siting a bank."[69] Wetland creation is expressly discouraged because of "continued uncertainty regarding the success of wetland creation or other habitat development."[70] In addition, created wetlands often require hydrologic manipulations that may require on-going operation and maintenance. The 1995 guidance warns against over-engineered mitigation that is not self-sustaining.[71] Because creation and enhancement offer less assurance for providing functional equivalency and include tradeoffs in wetland functions, these mitigation approaches should only be used when there are "adequate assurances to ensure success."[72]

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[64] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks.* 60 Fed. Reg. 228, 58605-58614. 1995. II. D (5).

[65] *Id.*

[66] Cowardin, L.M.V. Carter, F.C. Golet, and E.T. LaRoe. *Classification of Wetland and Deepwater Habitats of the United States*" FWS/OBS-79/31. Washington, DC: U.S. Fish and Wildlife Service, 1979. See <http://wetlands.fws.gov/Pubs_Reports/Class_Manual/class_titlepg.htm>.

[67] Brinson, M. "A Hydrogeomorphic Classification for Wetlands." U.S. Army Corps of Engineers, WES Technical Report WRP-DE-4:1-79. 1993.

[68] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks.* 60 Fed. Reg. 228, 58605-58614. 1995.

[69] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks.* 60 Fed. Reg. 228, 58605-58614. 1995. II.B3. *See also*: National Research Council. *Compensating for Wetland Losses Under the Clean Water Act.* Washington, D.C.: National Academy Press, 2001. 125.

[70] U.S. Environmental Protection Agency and U.S. Department of the Army. *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.* 1990. II.C (3).

[71] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks.* 60 Fed. Reg. 228, 58605-58614. 1995. *See also*: National Research Council. *Compensating for Wetland Losses Under the Clean Water Act.* Washington, D.C.: National Academy Press, 2001. 4.

[72] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks.* 60 Fed. Reg. 228, 58605-58614. 1995.

The 1990 MOA states that simple purchase or "preservation" of existing wetlands should not be considered adequate compensation except in "exceptional circumstances."[73] The national goal of the wetlands regulatory program is to achieve no net loss of wetlands functions.[74] If regulators allow permitted wetland losses to be replaced through the preservation of existing wetlands, rather than restoration, creation, or enhancement, a net loss of wetlands will occur. The 1995 guidance reinforces the earlier position on preservation: "Credits may be given when existing wetlands and/or other aquatic resources are preserved in conjunction with restoration, creation or enhancement activities, and when it is demonstrated that the preservation will augment the functions of the restored, created or enhanced aquatic resource."[75] However, considerable debate exists on the role of preservation in the mitigation equation (see section IV. "Mitigation methods in use").

In sum, to compensate for permitted wetland impacts, the regulatory agencies specify a preference for on-site, in-kind mitigation, followed by off-site, in-kind mitigation when it is determined to be environmentally preferable and particularly for small impacts. Mitigation banking is recognized as an "acceptable form of compensatory mitigation." Wetland restoration should take precedence over enhancement and creation as a mitigation method, preservation is only acceptable in "exceptional circumstances," and wetland creation is expressly discouraged.

## ESTABLISHMENT OF MITIGATION BANKS: ENABLING INSTRUMENTS AND OVERSIGHT

Mitigation banks must be recognized by the appropriate regulatory agencies with jurisdiction over wetlands activities before they can become fully operational. Since 1995, the procedure for establishing mitigation banks that are authorized by the Corps and used to mitigate for §404 permitted impacts has been guided by the 1995 guidance. The official sanction for these banks takes the form of a wetland banking instrument. For mitigation banks that are authorized by state or local regulatory agencies, this official sanction often takes the form of a permit or other enabling instrument.

*A **mitigation banking instrument** describes "in detail the physical and legal characteristics of the bank, and how the bank will be established and operated."*

Source: "Federal Guidance for the Establishment, Use and Operation of Mitigation Banks." Federal Register Vol. 60, No. 228. 58605-58614. Tuesday, November 28, 1995.

### Enabling instruments prior to 1995

Prior to the 1995 guidance, the official recognition of a bank took a variety of forms. At one extreme, regulatory agencies allowed informal "handshake" agreements, such as the one that created the Louisiana Department of Transportation and Development mitigation bank. At the other extreme were highly detailed planning documents such as the Juneau Wetlands Management Plan, which not only provided for mitigation banking, but also fit it into the larger context of regional wetland management.[76] More frequently, formal enabling instruments were adopted that memorialized the terms under which the bank would operate. These most often took the form of memoranda of agreement/understanding, individual development project permits, individual bank permits, general permits, corporate charters, letters of approval, or legislation.

### Enabling instruments after 1995

Following issuance of the 1995 banking guidance, the first step for establishing a bank is for the prospective bank sponsor to submit a prospectus to the Corps (or NRCS where appropriate) to initiate the planning and review process. The details of what a bank prospectus should include are not outlined in the guidance. However, the 1995 guidance states that the documents should include "sufficient information concerning the objectives for the bank and how it will be established and operated."[77] The prospectus gives the regulatory agencies the ability to review the "general need for and technical feasibility" of the proposed bank.[78]

The 1995 guidance established a new vehicle and process for approving wetland mitigation banks—the **mitigation banking instrument**. Banking instruments outline the establishment, operation, and maintenance of mitigation banks. Banking instruments are signed

[73] U.S. Environmental Protection Agency and U.S. Department of the Army. *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*. 1990. II.C (3).

[74] *Id.* at II.B., III.B.

[75] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995. II. B. 4.

[76] Environmental Law Institute. *Wetland Mitigation Banking*. Washington D.C.: Environmental Law Institute, 1993.

[77] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995. II.C.1.

[78] *Id.*

by the bank sponsor and the concurring regulatory and resource agencies that serve on the Mitigation Banking Review Team (see below).[79]

According to the guidance, the following information should be included in the banking instrument:

- Bank goals and objectives;
- Ownership of bank lands;
- Bank size and classes of wetlands;
- Description of baseline conditions at the bank site;
- Geographic service area;
- Wetland classes or other aquatic resource impacts suitable for compensation;
- Methods for determining credits and debits;
- Accounting procedures;
- Performance standards for determining credit availability and bank success;
- Reporting protocols and monitoring plan;
- Contingency and remedial actions and responsibilities;
- Financial assurances;
- Compensation ratios; and
- Provisions for long-term management and maintenance.

In 1996, the Corps' Institute for Water Resources issued a Technical Paper, "National Wetland Mitigation Banking Study: Model Banking Instrument."[80] The model banking instrument details the structure and language of a model banking agreement. The Institute also issued a paper, designed to supplement the 1995 banking guidance, that describes the planning process involved in establishing a wetland mitigation bank.[81]

### Umbrella instrument

In some cases, government development agencies, such as state transportation agencies, may foresee the need to establish multiple wetland mitigation banks or a regional banking program to compensate for anticipated wetland impacts. In such cases, umbrella agreements may be established. **Umbrella agreements** are banking instruments sponsored by a single entity to establish and operate a regional banking program with multiple bank sites.[82] The 1995 banking guidance offered this first definition of an umbrella instrument.

*An **umbrella bank** is a regional banking program with multiple bank sites sponsored by a single entity.*

Umbrella agreements establish the parameters of the banking program. Supplemental information on the individual banks approved under the umbrella agreement is included in individual site plans that are submitted to the Mitigation Banking Review Team as the sites are identified. In general, statistics about bank sites established under umbrella agreements is difficult to obtain. The bank sponsor, rather than the Corps or state regulatory agency, often maintains this information. The sponsoring agency or the bank sponsor may maintain clear documentation of the number of sites with credits remaining. However, information about the total number of sites authorized under an umbrella agreement, the location of the sites and their acreage is often difficult to obtain (see section V. for more on umbrella agreements).

### Other enabling instruments

Wetland mitigation banks may be used to compensate for impacts to wetlands not regulated by the Corps under §404 of the CWA. As states have the authority to regulate wetlands in a manner more restrictive than that outlined in the CWA, they may require mitigation for activities outside of the §404 program. In these cases, banks may be established through an enabling instrument other than a formal banking instrument. Just as with enabling instruments prior to the 1995 guidance, these agreements may take many forms. Florida, for example, issues state permits to bank sponsors outlining the bank parameters.

### Mitigation Banking Review Team

The 1995 guidance established the procedure for approving wetland mitigation banks. In each Corps district where a mitigation bank is proposed, a **Mitigation Banking Review Team**, or MBRT, is established to "facilitate the establishment of mitigation banks through the development of mitigation banking instruments."[83] When the bank is established to compensate

[79] *Id.* at II.C.2.

[80] Institute for Water Resources. *National Wetland Mitigation Banking Study: Model Banking Instrument.* Alexandria, VA: Institute for Water Resources, U.S. Army Corps of Engineers, May 1996. IWR Technical Paper WMB-TP-1. *See* <http://www.iwr.usace.army.mil/iwr/pdf/wmb_tp1_May96.pdf>.

[81] Institute for Water Resources. *Natinoal Wetland Mitigation Banking Study: Technical and Procedural Support to Mitigation Banking Guidance.* December 1995. IWR Technical Paper WMB-TP-2. *See* < http://www.iwr.usace.army.mil/iwr/pdf/wmb_tp2_Dec95.pdf>.

[82] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks.* 60 Fed. Reg. 228, 58605-58614. 1995.

[83] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks.* 60 Fed. Reg. 228, 58605-58614. 1995.

*A **mitigation banking review team** is an "interagency group of Federal, state, tribal and/or local regulatory and resource agency representatives which are signatory to a banking instrument and oversee the establishment, use and operation of a mitigation bank."*

Source: Federal Guidance for the Establishment, Use and Operation of Mitigation Banks. 60 Fed. Reg. 228, 58605-58614. 1995.

for §404 permitted activities the Corps serves as chair of the MBRT. The other regulatory agencies that serve on the MBRT do so on a case-by-case basis as appropriate given the projected use for the bank. Typically, EPA, FWS, and state and local regulatory resource agencies serve on the MBRT. In some cases, NMFS, NRCS, and tribal regulatory agencies participate. In cases where a mitigation bank is established to comply with the Food Security Act, NRCS serves as the MBRT Chair. When a bank is established to satisfy mitigation requirements under other federal, state, tribal, or local programs, the agency administering the program may serve as co-chair of the MBRT. Bank sponsors are responsible for preparing the banking instruments in consultation with the MBRT.

The agencies that serve on the MBRT are not required to sign the banking instrument, but those that do agree to the terms of that instrument. There are cases where MBRT members object to the terms of the banking instrument and may choose not to be signatories (see section IV. "Bank approval").

## BANK BASICS

Although it is increasingly difficult to generalize about today's mitigation banks, there are some general organizational categories into which most banks fit. While the players involved in banking differ widely from bank-to-bank, there are some broad definitions that can be used to help describe the different roles played by each entity.

### ROLES

The **client** or **permittee** is the entity or entities whose activities will result in a permitted wetland impact for which mitigation is being sought through a bank. A permittee can be any private or public entity whose project meets the permit requirements. Clients represent market demand for compensatory mitigation credits and need not have any involvement in the actual mitigation bank establishment other than a willingness to pay for the credits to meet their mitigation obligations.

The **permitting agency**, generally the Corps, state agency, or other regulatory entity with jurisdiction over impacts to wetlands, is the agency that makes determinations about whether a proposed project will be issued a permit, and therefore whether wetland impacts will occur. If a permit is awarded, the permitting agency determines the level of mitigation required and how the permittee's mitigation obligations should be met (e.g., conducting on-site mitigation, making a payment in-lieu of mitigation, purchasing mitigation banking credits, conducting off-site permittee-responsible mitigation).

The **bank sponsor** is the entity, usually a government agency, private entrepreneur, or non-profit organization, responsible for credit production. Bank sponsors produce wetland credits on a specific site or sites by any of the accepted methods: restoration, creation, enhancement, or preservation. The bank sponsor acquires initial title or other right of entry to the proposed site, seeks preliminary approval from the regulatory agencies, and carries out the mitigation work. While some of these tasks may be contracted out or delegated, the bank sponsor bears primary financial and legal liability for successful construction and development of the mitigation site, and often for subsequent monitoring and maintenance.

The bank sponsor need not hold fee title to the mitigation site during bank establishment and credit sale. Bank sponsors can pay landowners, such as a state wildlife agency, county park, or private preserve owners, for the right to create credits on a specific parcel without assuming ownership. Bank sponsors must, however, have or demonstrate long-term (perpetual) control over the property.

In some cases, the bank sponsor is the client. In other words, the agency or company seeking to satisfy compensatory mitigation requirements for permitted impacts seeks and gains approval for establishment of a bank. In most of these cases, the bank sponsor establishes the bank solely to satisfy its own current and future mitigation needs, rather than to make credits available to the public.

The bank sponsor is responsible for assuring that the bank meets the performance standards set forth in the banking instrument. The banking instrument generally outlines the maintenance, monitoring, and enforcement mechanisms that establish the responsibility of the bank sponsor to develop and operate the bank properly. Bank sponsors are also required to establish and maintain an accounting system that documents the

activity of all mitigation bank accounts. The bank sponsor must submit documentation to the permitting agency when a debit or credit transaction occurs at the bank, as well as an annual ledger report for all mitigation bank accounts.[84]

The **long-term property owner** is the individual, agency, or organization that holds fee title to the bank site. Although the bank sponsor often holds fee title to the site during bank establishment and credit sale, long-term ownership of the site is often transferred to a public agency or non-profit organization, such as The Nature Conservancy, or a state wildlife agency. Long-term property owners may take responsibility for active monitoring and maintenance of the bank and financial liability for remedying mitigation failure or any damage to third parities (see section IV. "Bank operation and oversight"). In other cases, this responsibility remains with the sponsor or with a third party entity. Bank sponsors are required to provide funds for long-term maintenance of the bank.

### Responsibilities for bank establishment and operation

The Corps serves as chair of the MBRT when mitigation banks are established to offset impacts authorized under §404 of the CWA. The Corps then receives statements from the bank sponsors when credit transactions occur and is responsible for monitoring and enforcement.

The MBRT is primarily responsible for facilitating the establishment of mitigation banks through the development of mitigation banking instruments.[85] The MBRT chair seeks to bring the team to agreement on the terms and conditions of the banking instrument through consensus. However, where consensus cannot be reached the MBRT chair may make the final decisions on bank establishment.[86]

The MBRT chair receives several types of documentation from the bank sponsor: documentation of credit transactions, an annual ledger report for all mitigation bank accounts, and monitoring reports at intervals specified in the banking instrument. The chair must distribute the annual ledger report and the monitoring reports to the other members of the MBRT.[87]

The bank sponsor must assure the success of the debited compensatory mitigation activities at the mitigation bank.[88] The cost of mitigation credits to a third party is determined by the bank sponsor.[89] The sponsor is responsible for maintaining accounting procedures outlined in the banking instrument. In general, the sponsor must submit to the Corps a statement when credits are debited or additional credits are proposed.[90]

### Types of banks

Banks may be sponsored by any of four entities. A bank may be sponsored by: a public agency or a combination of governmental entities; a private entrepreneur or company; a non-profit organization or land trust; or a combination of public and private entities working together to provide compensation.

Bank type relates to the relationship between the bank sponsor and the bank client(s). Banks can generally be categorized into one of five types:

- **Single-user bank**—Single-user banks are those for which the sponsor is also the sole credit user or client. In 1992, the majority of the nation's banks were single-user banks established by state departments of transportation for the principal purpose of compensating for wetland losses attributed to their construction activities. The bank sponsor of a single-use bank can be a public or private entity. The majority of single-user banks are sponsored by public works agencies.
- **Public commercial bank**—These banks are sponsored by public entities generally to compensate for wetland losses caused by a combination of public works projects and private development. Public commercial, or general use, banks are established to serve a public service function available to both private developers and public entities.
- **Private commercial bank**—Private commercial, or entrepreneurial, banks are those sponsored by a private entrepreneur or private non-profit organization with credits available for sale on the open market. Clients for such banks may include public or private entities. The first truly entrepreneurial bank was permitted by the Corps in 1992. Today these banks represent the majority of all banks.
- **Combination public-private commercial bank**—A combination public-private bank is one that is

[84] *Id.*
[85] *Id.*
[86] *Id.*
[87] *Id.*
[88] *Id.*
[89] *Id.*
[90] Institute for Water Resources. *National Wetland Mitigation Banking Study: Model Banking Instrument.* Alexandria, VA: Institute for Water Resources, U.S. Army Corps of Engineers, May 1996. IWR Technical Paper WMB-TP-1.

established by a combination of public and private agencies to compensate for permitted wetland losses. Credits may be available to public agencies or to the general public.

- **Public bank**—A public bank is one that generates credits solely for use by multiple public agencies. The bank sponsor is one or a combination of several public entities, such as federal, state, and/or local government agencies.

### Securing the bank site

When a bank is established, the bank sponsor must specify in the banking instrument the type of real estate provisions that will be used to ensure that the bank will remain a wetland during bank operation. The bank site can be protected using several permanent land protection mechanisms, including conservation easements or full transfer of title.

## DEFINING AND DETERMINING WETLAND CURRENCY

Mitigation credits are the basis of trade for wetland mitigation banks. Mitigation banks require a system for defining the number of credits allocated to the bank and for determining the type and number of credits needed as compensation for any particular project. Bank credits are the "currency" that defines the unit of compensation for units of wetland loss.

### Credits and debits

A wetland **credit** is the standard unit of measurement for quantifying the net gain in wetland acreage or function that results from wetland restoration, creation, enhancement, or preservation. A credit may be measured by some standard of functional replacement, habitat unit, or by acreage of a particular type or quality of wetland. Although ideally credits are determined by a measure of functional equivalency, methodologies for conducting functional assessments tend to be complicated and time consuming.[91] As a result, acreage is commonly used as the measure for defining credits (see section IV. "Wetland valuation and crediting").

A wetland **debit** is the standard unit of measure for quantifying wetland disturbance or loss. Debits are expressed in the same terms as credits; they either relate to some measure of functional equivalency or acreage.[92]

Wetland credits and debits are the form of currency that is used in banking transactions. When permitted impacts to wetlands occur, the regulatory agency generally determines the extent of the loss in terms of debits. If the Corps decides that mitigation for the permitted impacts can take place through the use of a mitigation bank, the agency determines the amount of credits that must be purchased to mitigate for the debited loss.

### Credit and debit evaluation

Mitigation banks need a system for valuing the compensation credits produced by the bank and for determining the number and type of credits needed as compensation for any particular project. The 1990 MOA states that when unavoidable wetland impacts are permitted, lost wetland functional values should be replaced. At a minimum, mitigation should provide one for one functional replacement "with an adequate margin of safety to reflect the expected degree of success associated with the mitigation plan…"[93] In order for wetland functional values to be replaced, the Corps must first assess the wetland functions that will be lost by the permitted activity.

In an effort to provide a measure for evaluating two different wetlands so that the degradation of one can be offset by the restoration, creation, enhancement, or preservation of the other, wetland scientists and managers have developed dozens of evaluation methods ranging from the complex to the simple.[94] These methods attempt to establish, in a qualitative or quantitative fashion, the nature and extent of different services that a wetland may provide. Once those services are known, they may be translated into a "currency" which can serve as the basis for establishing mitigation ratios for purchasing wetland mitigation bank credits. The two most common evaluation methods are to simply use acreage as a proxy for functions and to utilize a functional as-

[91] Brumbaugh, Robert and Richard Reppert. *National Wetland Mitigation Banking Study: First Phase Report.* Alexandria, VA: Institute for Water Resources, February 1994. IWR Report 94-WMB-4.

[92] *Id.*

[93] U.S. Environmental Protection Agency and U.S. Department of the Army. *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.* 1990. III.B.

[94] Bartoldus, C. *A Comprehensive Review of Wetland Assessment Procedures: A Guide for Wetland Practitioners.* St. Michaels, MD: Environmental Concern Inc., 1999; Kusler, J. and W. Niering. "Wetland Assessment: Have We Lost Our Way?" *National Wetlands Newsletter* 20:2 (March-April 1998): 1, 9-14; Brinson, M. "Assessing Wetland Functions Using HGM." *National Wetlands Newsletter* 18:1 (Jan.-Feb. 1996): 10-16.

sessment methodology (see section IV. "Wetland valuation and crediting").

The 1990 MOA states and the 1995 guidance makes clear that, where practical, an appropriate functional assessment methodology should be used to assess wetland restoration, creation, and enhancement activities and to quantify the amount of available credits. However, if such a methodology is impractical to use, acreage may be used as a surrogate for measuring function.[95]

**Acreage-based measurements**

The most common and simple methodology for assessing wetland functions for the purpose of assigning credits is to utilize wetland acreage as a proxy for wetland functions. Using acreage to evaluate credit generation generally is time efficient, cost effective, and does not require the use of professional expertise. However, basing credits on acreage assumes that the functional value one acre of the wetland lost will equal the functional value of one acre of the mitigation wetland. This may be true in circumstances where bank credits are being withdrawn for in-kind permitted losses of wetlands with the same functional value. However, when a bank is used to replace wetlands out-of-kind (bottomland hardwood forests are being replaced with a freshwater marsh), this is likely not the case. In addition, if a high quality wetland is being replaced with a lower quality wetland of the same type, using a straight acreage measure would lead to a net loss of wetland functions.

**Functional assessment methodologies**

Functional assessment methodologies attempt to help quantify all or a narrow set of wetland functions and assign area or functional units to the wetland. Three well-known functional assessment methodologies include the Wetland Evaluation Technique (WET), Habitat Evaluation Procedures (HEP), and Hydrogeomorphic Approach (HGM). In addition, some states, regions, and Corps districts have developed their own functional assessment methodologies. However, all of these methodologies have their limitations. For example, HEP, which was developed to quantify fish and wildlife habitat, does not consider functions other than habitat for fish and wildlife (see section IV. "Wetland valuation and crediting").[96]

**Mitigation replacement ratios**

Credit and debit evaluation methods serve two purposes. First, they define the number of credits that are available at the bank. Second, they establish a measure of the impacts at the permitted site from which the mitigation replacement ratios can be calculated. A mitigation replacement ratio, or compensation ratio, is "the number of units of credit (functional units or acres) which must be debited from a bank in order to compensate, or replace, one unit of wetland which is expected to be lost."[97]

For example, a bank may use acreage as a currency, but there may be concern on the part of the regulatory agency that an acre of created wetland purchased from a particular bank will not compensate for the loss of an acre of naturally occurring mature bottomland hardwood forest, a particularly difficult wetland type to replace. The permittee may then be required to purchase three acres of banked wetland for each acre of impact to the forested wetland—a 3:1 ratio.

Ratios are used in mitigation banking programs, among other things, to reflect the comparative value of dissimilar wetland types and to compensate for the uncertainty that a bank will be able to compensate for permitted wetland losses. For example, higher mitigation ratios may be applied for impacts to rare wetland types, wetlands that are difficult to restore or create, for out-of-kind replacement, and to favor more reliable forms

**WETLAND FUNCTIONS AND VALUES**

Wetland **functions** are those services that wetland perform, regardless of how these services are valued by society. Wetland functions include flood storage, groundwater recharge, storm wave and surge protection, fisheries and wildlife production and habitat, pollution and sediment assimilation, and nutrient cycling. Wetland **values** are those services that wetlands perform that are considered beneficial to society. Some wetland values include aesthetic, open space, water quality and educational values. Wetland values and functions can and often do overlap. For example, the flood storage function of a wetland may be considered a high value by someone who lives in the floodplain of a river that has a tendency to flood, but not by someone who is not at risk of being harmed by a flood. Nonetheless, flood control is a function provided by that wetland, regardless of whether or not it is valued by society.

[95] U.S. Environmental Protection Agency and U.S. Department of the Army. *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*. 1990. III. B.; Federal *Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995. II. D. 7.

[96] Brumbaugh, Robert and Richard Reppert. *National Wetland Mitigation Banking Study: First Phase Report*. Alexandria, VA: Institute for Water Resources, February 1994. IWR Report 94-WMB-4. 32.

[97] *Id.* at 19.

of mitigation over less reliable forms, such as favoring wetland restoration over creation or preservation. Although a 1.5:1 ratio may be required for banks established through restoration of a degraded wetland, a ratio of 10:1 might be required for banks established by preserving an already existing and functionally robust wetland. Higher ratios can also be used to compensate for the stage of development of the replacement wetland. For example, if a particular bank were established through restoration that would normally require a 1.5:1 replacement ratio, a higher ratio may be required if bank credits are sold in advance of bank maturity to account for the uncertainty that the lost wetland functions would be replaced. In this case, ratios are used to deal with uncertainty by charging a "risk premium," as well as a "temporal premium."

### Timing of credit withdrawal

Functional or design milestones generally determine the number of credits theoretically available at a bank for sale and withdrawal at the time of debiting (see sections IV. "Wetland valuation and crediting," "Performance standards in practice," and "Design standards"). In theory, mitigation banking is the restoration, creation, enhancement, or preservation of wetlands to compensate for wetland losses *in advance* of permitted development activities. However, because of the financial costs of establishing banks, regulatory agencies allow bank sponsors to release credits for sale before the bank reaches functional maturity.

The 1995 guidance outlines three minimum requirements under which advanced debiting may occur: "1) banking instrument and mitigation plans have been approved; 2) bank site has been secured; and 3) appropriate financial assurances have been established. In addition, initial physical and biological improvement should be completed no later than the first full growing season following initial debiting of a bank."[98]

Because advance sale of credits allows for a temporal loss of wetland functions, the permitting agency may require higher mitigation replacement ratios in these cases. Decisions about the percentage of advance credits that will be available for sale are made on a case-by-case basis.[99] The 1995 guidance does not set a ceiling or minimum percentage of advance credits that can be released. Although proposed guidance used 15 percent as an example, the preamble to the final guidance states: "The final guidance is being revised to eliminate the reference to a specific percentage in order to provide needed flexibility."[100] (See section IV. "Credit release.")

Banking instruments (or banking statutes, regulations, or guidelines) may provide detailed information on the schedule of credit release. These sections may provide information about the percentage of credits that will become available after specific milestones are met, such as having a conservation easement in place, securing adequate funds, or meeting hydrologic criteria.

### Assigning credits to non-mitigation activities

Wetland mitigation banks are established to provide compensation for permitted wetland losses. In order to assure comparability of the replacement wetland to the lost wetland, banks must define "credits," or units of trade. Because the goal of the wetland regulatory program is to achieve no net loss of wetland functions, any bank activity that generates credits but does not replace permitted wetland losses, raises substantial concern. Three issues related to assigning credits for non-wetland acres are addressed below—the protection of uplands, non-native invasive species control efforts, and research and education activities.

**Assigning credits for protection of upland areas**

Wetland mitigation banks that have been designed to replace lost wetland functions, but are surrounded by incompatible land uses, such as a development that produces a large amount of stormwater runoff laden with sediments, will suffer impacts and some diminution of wetland functions. Therefore, protecting uplands or buffers surrounding a mitigation bank can serve to minimize adverse impacts of adjacent land uses, protect them from edge effects, which make them more vulnerable to invasion by exotic species, and can con-

[98] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995.

[99] *Id.* The 1995 guidance does not set a ceiling or minimum percentage of advance credits that can be released. The proposed guidance used 15 percent as an example, and the "Supplementary Information" section of the final guidance states "The percentage of advance credits permitted for a particular bank may be higher or lower than the 15 percent example included in the proposed guidance. The final guidance is being revised to eliminate the reference to a specific percentage in order to provide needed flexibility."

[100] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995. Supplementary Information.

nect the replacement wetland to other natural areas that serve to enhance the effective size of the wetland.

However, if credits are assigned to upland or buffer areas, in effect, permitted wetland impacts can be mitigated with upland acres resulting in a net loss of wetland acres and functions. The banking guidance does allow limited credits to be assigned to upland areas "only to the degree that such features increase the overall ecological functioning of the bank."[101] However, the protection of non-wetland features as the *only* mitigation requirement for authorized impacts does not support the no net loss of wetlands goal (see section IV. "Wetland types available for crediting").

**Assigning credits for invasive species eradication and control**

Invasive species pose a severe threat to the nation's plants, animals, and ecosystems. An **invasive species** is a species that is non-native (or alien) to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health. Wetlands have been particularly affected by a number of these species. For example, every year thousands of acres of wetlands are invaded by purple loosestrife (*Lythrum salicaria*), an ornamental plant from Europe introduced in the 1800s.[102] This species now occurs in all continental states, seriously affecting the Northeast and upper Midwest. The species alters the fundamental structure of its new habitat by filling open water with dense, impenetrable stands up to thousands of acres in size.[103]

Naturally occurring wetlands that have been occupied by invasive species may cease to provide their full complement of functions. As such, the removal of invasive species may increase the functional value of the wetland. Many wetland mitigation projects propose to control or remove invasive species as part of the mitigation plan and/or long-term maintenance requirements.

Although control of invasive species is essential for ensuring that wetland functions are preserved in perpetuity, whether or not invasive species control in an existing wetland constitutes compensatory mitigation and should be a source of mitigation credits is a point of debate. On an acre-for-acre basis, the control of invasive species as the sole restoration activity does not contribute to a net gain in wetland acreage, although it may contribute to a net gain in wetland functions. The one-time removal of invasive species should clearly not be the basis for wetland mitigation credits, particularly because areas infested with invasive species tend to have recurrences after the initial removal of the species. However, if the mitigation project includes the eradication and on-going control for those species, with the concomitant restoration of natural wetland functions, the removal and control of invasive species should be considered a legitimate restoration tool.

**Assigning credits for research, education, or recreation**

Providing the public or academic institutions with access to mitigation sites for research or for educational and recreational opportunities may be viewed as a public value. However, providing credits to wetland mitigation banks or in-lieu-fee mitigation projects for purposes other than wetland restoration, enhancement, or creation, does not promote the no net loss policy.

## BANK SITING CONSIDERATIONS

The 1995 banking guidance states that federal agencies should give careful consideration to the ecological suitability of a site for achieving the goals of the bank (see section IV. "Bank siting").[104] Banks may be established on public or private lands, and in some circumstances, may be located on federal, state, tribal, or locally owned areas if the policies of the public agency allow use of its land for such purposes. In 1999, the FWS determined that compensatory mitigation would not be allowed on National Wildlife Refuge System lands "because these lands are already targeted for restoration, and we will be restoring these lands in the future. Additionally, refuge lands may not be used to establish wetland mitigation banks."[105]

The credits generated by banks on public land can be based only on the additional ecological values of the wetland associated with establishment of the bank, rather than functional values existing, planned, or achieved through preservation.[106] This point is an important one

[101] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995.
[102] Cox, G. 1999. Alien Species in North America and Hawaii: Impacts on Natural Ecosystems. Island Press, Washington, D.C. Thompson, D.Q., R.L. Stuckey, and E.B. Thompson. 1987. Spread impact and control of purple loosestrife (*Lythrum salicaria*) in North American wetlands. USDI Fish and Wildlife Service. Washington, D.C. 215pp.
[103] *Id*.
[104] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995. II. B. 2.
[105] *Final Policy on the National Wildlife Refuge System and Compensatory Mitigation Under the Section 10/404 Program.* 64 Fed. Reg. 175, 49229-49234.
[106] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995. II. B. 2.

*"The **service area** of a mitigation bank is the designated area (e.g., watershed, county) wherein a bank can reasonably be expected to provide appropriate compensation for impacts to wetlands and/or other aquatic resources."*

Source: Federal Guidance for the Establishment, Use and Operation of Mitigation Banks. Federal Register, Vol. 60, No. 228. 58605-58614. Tuesday, November 28, 1995.

—the reduction of credits assures that the wetland functions already protected by public action are not available as credits to be sold. Concerns over siting banks on public lands arise out of fear that if a mitigation bank is established on public lands, the mitigation actions will not be contributing to the no net loss goal if the mitigation was already accomplished or the agency had the capacity to secure funds to carry out the restoration activities. In addition, unless the number of credits assigned to the bank takes into account the fact that the bank sponsor has not had to secure long-term protection and ownership of the land, the public may be subsidizing banking, as some of the costs of bank establishment are already accounted for.

### Geographical location

Mitigation banks can sell credits to permittees whose impacts occur within a designated geographic **service area** (e.g., hydrologic unit, watershed, county, region).[107] The boundary of the service area is generally set forth in the banking instrument. The 1995 guidance states that the service area should be based on hydrologic and biotic criteria. The guidance further suggests that service areas be based on the "Hydrologic Unit map of the United States" developed by the U.S. Geological Survey (USGS) and one of two ecoregional maps developed by the federal agencies.[108] However, trades beyond the service area may be authorized on a case-by-case basis "where it is determined to be practicable and environmentally desirable."[109] The discretion given to the Corps in determining the size of service areas and in allowing impacts that occur beyond the boundaries of service areas to credit a bank can result in controversy if the service area is either too small or too large.

[107] *Id.* at II. D. 3.
[108] *Id.*
[109] *Id.*

### Location matters

The functions that wetlands perform are not abstract or portable. Indeed, wetland functions have value because of where they exist in the landscape. A prairie pothole provides essential habitat because of its location in the flyway of migratory waterfowl. A riparian wetland provides flood control because of its location along a river or stream. An estuarine wetland provides nursery areas for valued species that thrive in a transitional environment between freshwater and marine habitats.

The importance of retaining wetland functions within a specific landscape is one of the primary reasons underlying the 1990 MOA preference for on-site mitigation. At least in theory, on-site mitigation is preferable to off-site mitigation because it replaces similar functions and values to those lost to development, and it does so in the same location. However, many of the ecological and compliance problems often associated with on-site mitigation, such as widely fluctuating water levels, isolation from other habitats, and encroachment from adjacent development, may be avoided with off-site mitigation. Appropriate bank siting can serve to maximize the functions and values of a replacement wetland if an ecologically sustainable site is chosen.

A 1997 study compared the locations of where wetland mitigation banks were sited in Florida to where permitted wetland losses were occurring to determine how wetland functions and values were being traded across the landscape. The study found that wetlands were being transferred from highly urbanized, high-population density areas to more rural, low-population density areas. Permits for wetland destruction were being issued in areas were growth was occurring. Because of high land costs, however, wetland banks were instead being sited in more rural areas where land costs were lower.[110]

Moving wetlands across the landscape may have a serious impact on wetland functions and their human values. Although wetland functions may be similar in the lost wetland and the mitigation site (both have the *ability* to filter sediments and provide habitat to wildlife and flood control benefits), because the mitigation wetland is no longer located where people live, the value of the replacement wetland may be diminished. The mitigation wetland may have the ability to filter sediments from run-off, but because there is minimal sedimentation in the rural compared to the urban area, this

[110] King, Dennis M. and Luke W. Herbert. "The Fungibility of Wetlands." *National Wetlands Newsletter.* 18:4 (1997): 10-13.

function is not fully realized. The mitigation site may be able to provide flood storage functions, but because fewer people live nearby, and the wetland is not located in a floodplain, this function and its associated value is minimized, while flooding increases in the area where the original wetland was lost.

In addition to concerns about whether mitigation sites are functionally equivalent to natural wetlands, the location of replacement wetlands will determine whether those functions, if achieved, are realized. When wetlands are traded across the landscape, so are their real and potential functions. Depending on how these functions are valued, the relocation of wetland functions may be of significant concern. Again, wetland mitigation banking may help to achieve no net loss of wetland acreage, but the location of mitigation sites may affect whether or not the replacement of wetland functions and values is achieved.

Concerns have also been raised about the sustainability of wetlands in urbanizing landscapes. Both naturally occurring and mitigation wetlands are susceptible to degradation in areas that are under development. Development surrounding these wetlands may result in heavy sediment loads, decreased water quality, altered hydroperiods, loss of adjacent uplands, and other effects that can lead to wetland degradation.[111] In part, this may account for why wetland mitigation sites are often located in more rural settings. In sum, location is critical to the ecological functionality of wetlands, even if the bank is not close to an urban area. Inappropriately located mitigation sites are a major reason for mitigation failure.

### Size matters

The 1995 banking guidance lists several advantages of consolidating wetland mitigation into banks off-site. The guidance presumes that consolidating compensatory mitigation into a larger parcel improves the likelihood of achieving functional equivalency with the impact site because financial resources, planning, and scientific expertise can be leveraged. The loss of multiple small wetland impacts is often mitigated with one large mitigation bank that consolidates the lost acreage. The 1995 banking guidance established a preference for replacing small impacts with larger off-site mitigation banks. "In general, use of a mitigation bank to compensate for minor aquatic resource impacts (e.g., numerous, small impacts associated with linear projects; impacts authorized under nationwide permits) is preferable to on-site mitigation."[112] Federal policy has created a bias toward mitigating small impacts with large wetlands.

Increasingly, scientific evidence demonstrates that small isolated wetlands provide unique ecological and water quality functions. In addition, assemblage of small wetlands across a landscape may be equally important for many species. For example, many species of amphibians depend on small, seasonally dry wetlands for portions of their life cycle. The proximity of these small wetlands to other wetland complexes is critical for their dispersal.[113] The habitat functions provided from individual small wetlands or assemblages of small wetlands may not be able to be replicated by large consolidated wetlands. Scientists have suggested that wetland regulations should focus not just on wetland size, but also on local and regional wetland distribution when making permitting and mitigation decisions.[114]

## BANK OPERATION

The operational life of a bank is the period during which the terms and conditions of the banking instrument are in effect. This period ends when all compensatory mitigation credits have been purchased or banking activity is voluntarily terminated, and the debited bank is determined to be functionally mature, as specified in the banking instrument.[115]

Throughout the operational life of the bank, the bank sponsor is responsible for managing and assessing the development of the bank and reporting findings to the authorizing agency. During the period that the bank is in operation, the number of available credits in the mitigation bank may be adjusted to reflect changes in the conditions of the site.[116]

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[111] Environmental Law Institute. *Stakeholder Forum on Federal Wetlands Mitigation.* Washington D.C.: Environmental Law Institute, December 2001.

[112] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks.* 60 Fed. Reg. 228, 58605-58614. 1995. II. D. 4.

[113] Semlitsch, Raymod D. "Size Does Matter: The Value of Small Isolated Wetlands." *National Wetlands Newsletter.* 22:1 (2000). 5-6, 13. NOTE: This article summarizes the findings of several scientific studies on the ecological importance of small, isolated wetlands.

[114] *Id.* at 46-59.

[115] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks.* 60 Fed. Reg. 228, 58605-58614. 1995. II. E. 1.

[116] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks.* 60 Fed. Reg. 228, 58605-58614. 1995.

## FINANCIAL ASSURANCES

Given the possibilities for mitigation failure and the risk of allocating liability, financial guarantees can serve as an important assurance for bank performance. The bank sponsor is responsible for securing sufficient funds or other financial assurances to cover contingency actions in the event of bank default or failure. There are numerous financial instruments that can serve to improve the chances of a bank meeting its performance standards. These assurances can provide a source of funds in the event of contingencies, such as: performance bonds, irrevocable trusts, escrow accounts, casualty insurance, letters of credit, or legislatively enacted dedicated funds for government-operated banks (see box "Financial assurances").

Financial assurances, when appropriately defined, serve two purposes: to ensure that funds will be available to repair and maintain the site in the event of a problem not corrected by the credit producer and to provide the credit producer with a financial incentive to design, construct, and maintain the site properly.

Financial assurances may be more stringent for banks that utilize mitigation measures with less confidence of success, such as creation; attempt to mitigate wetland types that are more difficult to establish, such as bottomland hardwood forests; and for banks that plan to sell credits in advance of the bank reaching maturity. Once the bank is functionally mature or self-sustaining (as defined in the banking instrument), the financial assurance may be phased out or reduced. It may also be phased out depending on the successful completion of activities associate with different stages of wetland project implementation. Other financial assurances may be required during the long-term management and monitoring phase.

## PERFORMANCE STANDARDS

**Performance criteria** are often outlined in a banking instrument to link ecological performance (bank "success"), or stages of ecological performance, to requirements for financial assurances, the timing of credit release, and monitoring periods. Performance criteria are expressed as measurable **performance standards** (see section IV. "Performance standards in practice"). They can be used to measure ecological functions or physical properties, such as the attainment of appropriate wetland hydrology, percent coverage of vegetation, percent species composition or some measure of diversity.[120]

### FINANCIAL ASSURANCES

**Performance bonds**

The credit producer purchases a bond from a third party surety (paying a premium and posting collateral), or provides a bond, letter of credit, or other assets that ensure that the site functions properly for the specified period and that all necessary corrective actions will be taken. Once the period has ended and performance has been met, the bond is released. The bond can also be released in stages as different milestones are reached. The bond provides both a source of funds that can be drawn on by the regulatory agency in the event of bank failure and an incentive for the credit producer to take corrective measures so that the bond can be released.

**Escrow accounts**

The bank sponsor places a predetermined amount of money into a bank account to be held until performance standards or other milestones are met. Often, a set amount of money, for example, $5,000 per wetland credit, is deposited into the account as each credit is sold. The amount of money per credit deposited into the account can be diminished as specified milestones or performance standards, are met. If the bank becomes insolvent, the escrow account becomes the property of the regulatory agency, which can use the funds to ensure that the promised mitigation does in fact occur. The funds are released to the bank sponsor once the monitoring period is over.

**Letter of credit**

An engagement by a bank or other person made at the request of the bank sponsor that the issuer will honor drafts or other demands for payment upon compliance with the conditions specified in the credit. A credit may be either revocable or irrevocable. The engagement may be either an agreement to honor or a statement that the bank or other person is authorized to honor. Letters of credit are intended generally to facilitate purchase and sale of goods by providing assurance to the seller of prompt payment upon compliance with specified conditions or presentation of stipulated documents without the sellers having to rely upon the solvency and good faith of the buyer.[117]

**Irrevocable trusts**

A trust which may not be revoked after its creation, as in the case of a deposit of money by one in the name of another as trustee for the benefit of a third person (beneficiary).[118]

**Casualty insurance**

Insurance that is primarily concerned with losses caused by injuries to persons and legal liability imposed upon the insured for such injury or for damage to the property of others.[119]

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[117] Nolan, Joseph R. and Jacqueline M. Nolan-Haley. *Black's Law Dictionary*. 6th Edition. St. Paul, MN: West Publishing Co., 1990. 903-904.

[118] *Id.* at 1511.

[119] *Id.* at 803.

[120] Institute for Water Resources. *National Wetland Mitigation Banking Study: Model Banking Instrument*. Alexandria, VA: Institute for Water Resources, U.S. Army Corps of Engineers, May 1996. IWR Technical Paper WMB-TP-1.

Performance standards can be, and often are, linked to several different aspects of bank operation. Performance standards can help define a bank's credit release schedule (see sections III. "Defining and determining wetland currency" and IV. "Credit release"). For example, 30 percent of a bank's credits may be available once the banking instrument has been approved, the bank site has been secured, and financial assurances have been established. Another 30 percent of the credits may become available after wetland hydrology and a certain percentage of vegetative cover has been achieved, and the remaining credits may be available following the realization of all established performance standards.

Some credit release schedules, however, are based on the achievement of structural milestones, or design criteria, rather than ecological performance standards. For example, credit release for the Fox Creek Stream Mitigation Bank in Missouri is based on a combination of design criteria and performance standards. The bank allows 15 percent of the total anticipated credits to be available upon approval of the banking instrument, maintenance of adequate funds and financial insurance, and security of real estate assurances. Another 15 percent of the credits are available upon completion of planting of the riparian corridor. Another 25 percent of the credits are available after all construction, including streambank stabilization and channel enhancement. The remaining 45 percent of credits are available after successful demonstration of mitigation bank objectives, including meeting required performance standards.[121]

Performance standards can also be linked to financial assurances (see sections III. "Financial assurances" and IV. "Financial assurances for bank establishment"). For example, a banking instrument may require a high degree of financial assurances if credits are released prior to any performance standards being met. As performance standards are met, the amount of required financial assurances can be diminished.

Finally, the length of the monitoring period can be tied to meeting performance standards (see section IV. "Bank operation and oversight"). Rather than establishing a set time frame for requiring monitoring, such as five years, wetland banking instruments can require monitoring to continue until all of the performance standards are reached.

[121] Fox Creek, L.L.C. *Memorandum of Understanding Between Fox Creek L.L.C. and The U.S. Army Corps of Engineers.* MOU. St. Louis County, MO, 2000.

## ENFORCEMENT MEASURES AND REMEDIAL ACTION

Mitigation banking may provide a way to improve the enforcement record of compensatory mitigation. Enforcement provisions can be written into banking instruments and since banks consolidate mitigation into fewer areas, oversight by regulatory agencies may be easier. Enforcement provisions, however, do little to ensure that the required mitigation is conducted unless banks are routinely monitored and the enforcement provisions are used if banks are not in compliance (see section IV. "Remedial actions and enforcement").

Banking instruments often indicate the procedures that must be followed to identify and implement remedial measures at a bank if it is determined that the site has failed to meet performance standards. The 1995 banking guidance states that remedial measures "should be based on information contained in the monitoring reports (i.e., the attainment of prescribed performance standards), as well as agency site inspections."[122] The lead regulatory agency, in consultation with the MBRT and bank sponsor, ultimately makes the determination about whether or not remedial measures are required and the extent of those measures.

## LONG-TERM MANAGEMENT, MONITORING, PROTECTION, AND REMEDIATION

A formal monitoring and maintenance system is an important element of wetland mitigation banking. Maintenance provisions, often outlined in the banking instrument, require the bank sponsor to carry out certain maintenance measures, such as removal of invasive species or prescribed burning, consistent with established criteria. During bank operation, the bank sponsor is generally required to carry out these activities and is responsible for the associated costs. The bank sponsor is also responsible for funding long-term maintenance of the bank and identifying the entity that will be responsible for taking over long-term maintenance following the bank's operational phase.[123]

Regular monitoring of wetland mitigation banks is necessary to determine whether banks are meeting per-

[122] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks.* 60 Fed. Reg. 228, 58605-58614. 1995. II. E. 4.

[123] Institute for Water Resources. *National Wetland Mitigation Banking Study: Model Banking Instrument.* Alexandria, VA: Institute for Water Resources, U.S. Army Corps of Engineers, May 1996. IWR Technical Paper WMB-TP-1; *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks.* 60 Fed. Reg. 228, 58605-58614. 1995.

formance standards and to identify problems that might require remedial action.[124] Banking instruments should outline the bank sponsor's monitoring requirements. These provisions require the bank sponsor to perform specified monitoring to demonstrate compliance with performance criteria. Monitoring provisions may require the bank sponsor to conduct vegetation surveys, hydrologic monitoring, or wildlife utilization surveys. The bank instrument should also specify the frequency, methods, and period of monitoring required of the bank sponsor. The bank sponsor is required to submit to the MBRT chair a regular monitoring report at an interval specified in the banking instrument, usually on an annual basis.

The 1995 banking guidance suggests that monitoring periods will typically be five years, although this period can be extended for wetland types that require a particularly long time to become established, such as forested wetlands, or when remedial actions have been undertaken.[125] The 2001 NRC report suggests that monitoring periods should be extended for many created and restored wetland systems for which it takes longer than five years to determine whether mitigation goals have been achieved.[126] In lieu of requiring a predetermined monitoring period, banking instruments may require that monitoring continue until all performance criteria have been met. If performance criteria adequately reflect ecosystem functions, this approach seems particularly wise, as it allows for the consideration of unforeseen problems that might require remedial action and for wetland types that take longer to become established.

In most cases, the bank sponsor is required to carry out the monitoring requirements specified in the banking instruments. Requiring self-monitoring of a single-user bank forces the party causing an environmental impact to be responsible for ensuring that mitigation efforts are effective. Self-monitoring can also make enforcement easier because the enforcing agency can use the permittee's own data to prove non-compliance. Oversight by the regulatory agency on self-monitoring, however, is necessary to ensure adherence to monitoring requirements.

It is critical that the bank instrument specify the long-term ownership status of the bank to assure perpetual realization of the bank's ecological benefits and to ensure that incompatible land uses are prevented. The banked wetlands might otherwise be subject to development or degradation in the future. In some cases, mitigation banks remain the property of the bank sponsor. Private banks, however, more often seek to transfer long-term ownership of the bank to a natural resource agency, such as a state wildlife agency, or to a non-profit organization, such as The Nature Conservancy. A number of different real estate provisions can be used to protect the bank in perpetuity, including recording a conservation easement or transferring title of the land to a federal or state resource agency or non-profit conservation organization.[127]

Just as financial assurances are necessary during the operational stage of the bank, financial assurances are equally important following bank closure. During the long-term monitoring and maintenance period, the bank sponsor must identify the entity that will be responsible for providing these services, provide a source of funding for costs related to the services, and provide assurances that if bank failure occurs, funding is available to remedy the bank failure (see sections IV. "Financial assurances" and "Bank operation and oversight").

## COMPENSATORY MITIGATION AND THE WATERSHED APPROACH

Compensatory mitigation can be used strategically to help achieve regional conservation objectives. Government agencies can maximize the benefits of mitigation by proactively identifying, classifying, and evaluating existing wetlands and their potential for achieving wetland mitigation goals. Government agencies can strategically identify off-site areas that are ecologically suitable for mitigation, and therefore have a higher likelihood of achieving functional equivalency with an impact site or with reference wetlands. In addition, by identifying potential sites in advance, regulators can seek to maximize the compensation of lost functions. Watershed planning efforts can also seek to utilize mitigation to reduce the cumulative effects of multiple individual wetland impacts (see section IV. "Bank siting").

[124] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995. II. E. 3.

[125] Institute for Water Resources. *National Wetland Mitigation Banking Study: Model Banking Instrument*. Alexandria, VA: Institute for Water Resources, U.S. Army Corps of Engineers, May 1996. IWR Technical Paper WMB-TP-1; *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995. II. E. 3.

[126] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act*. Washington, D.C.: National Academy Press, 2001. 112.

[127] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995.

The 1995 banking guidance encourages the use of mitigation banks to address the specific resource needs of particular watersheds, ideally within the context of a comprehensive watershed plan.[128] The 2000 in-lieu-fee guidance supports making mitigation decisions based on local watershed planning efforts.[129] In addition, the 2001 NRC report strongly supports the selection of sites for wetland mitigation in the context of watershed planning.[130] The NRC committee concluded that regional watershed evaluation can help guide the creation of wetland corridors "that mimic natural distributions of wetlands in the landscape."[131]

NRC found that watershed planning could also set the stage for the relaxation of the current preference for on-site and in-kind mitigation. The study states, "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."[132] In its report, however, NRC acknowledges the risks of the watershed approach: "The committee is aware of the concern that a watershed approach might weaken the commitment during the permitting process to protect individual wetlands and the functions they provide, with existing wetlands being too readily traded for compensatory wetlands that might not be ecologically functional."[133]

Several wetland experts have supported the adoption of a watershed approach to permit and mitigation decision-making. When guided by a science-based watershed assessment, this approach is seen as a means to improving the compliance record of mitigation by supporting off-site mitigation options over on-site mitigation, which has a poor history of advancing the no net loss goal.[134] Watershed planning can also be the basis for out-of-kind mitigation decisions, if the end result is a net gain in priority wetland functions.[135] However, any relaxation of the on-site and in-kind preference for mitigation should be based on a science-based watershed assessment guided by national standards. Indeed, the call for the development of national guidance to define the standard for the watershed approach is one that has been aired for some time and has been reiterated more recently.[136]

## THE STATE REGULATORY CONTEXT FOR WETLAND MITIGATION BANKING

In addition to the federal guidelines developed to govern the creation and use of wetland mitigation banks, some states have developed their own statutes, regulations, or guidelines (see Appendix E). Twenty-three states have either statutes or regulations to authorize the use of wetland mitigation banks. Specifically, 12 states have both state statutes and regulations to authorize the use of wetland mitigation banks.[137] Nine states have only statutes,[138] while two states, Michigan and Ohio, have only regulations. Idaho currently has a proposed statute addressing wetland mitigation banks, and New Hampshire and Washington have proposed regulations.

Eight states have chosen to issue guidelines to govern the use of wetland mitigation banks, rather than to enact or adopt statutes and regulations.[139] Ten states with statutes and regulations have also issued guidelines.[140] Six of these 10 guidelines expand upon the statutes and regulations.[141] Delaware and Illinois have draft guidelines to address the operation of wetland mitigation banks.

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[128] *Id.*

[129] U.S. Department of the Army, U.S. Environmental Protection Agency, U.S. Department of Interior, and U.S. Department of Commerce. *Federal Guidance on the Use of In-Lieu-Fee Arrangements for Compensatory Mitigation under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.* 2000. 66915.

[130] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act.* Washington, D.C.: National Academy Press, 2001. 4.

[131] *Id.*

[132] *Id.*

[133] *Id. at* 144.

[134] Scodari, Paul and Leonard Shabman. "Rethinking Compensatory Mitigation Strategy." *National Wetlands Newsletter.* 23:1 (2001): 5; Turner, R. Eugene, Ann M. Redmond, and Joy B. Zedler. "Count it by Acre or Function – Mitigation Adds Up to New Loss of Wetlands." *National Wetlands Newsletter.* 23:6 (2001): 5.

[135] Scodari, Paul and Leonard Shabman. "Rethinking Compensatory Mitigation Strategy." *National Wetlands Newsletter.* 23:1 (2001): 5.

[136] Scodari, Paul and Leonard Shabman. "Rethinking Compensatory Mitigation Strategy." *National Wetlands Newsletter.* 23:1 (2001): 5; National Research Council. *Compensating for Wetland Losses Under the Clean Water Act.* Washington, D.C.: National Academy Press, 2001. 87.

[137] Arkansas, Florida, Illinois, Louisiana, Maine, Maryland, Minnesota, New Jersey, North Carolina, Oregon, Texas, and Wisconsin.

[138] California, Kentucky, Mississippi, Nebraska, Nevada, Tennessee, Virginia, Washington, and Wyoming.

[139] Colorado, Georgia, Hawaii, Idaho, Indiana, Iowa, Missouri, and South Carolina. "State guidelines" refer to the eight states that only have guidelines and the six that have expanded their formal programs through the issuance of guidelines (the remaining four state guidelines simply mimic the state statutes).

[140] Arkansas, California, Kentucky, Maryland, Minnesota, Oregon, Virginia, Washington, Wisconsin, and Wyoming.

[141] California, Kentucky, Minnesota, Virginia, Washington, and Wisconsin.

Some counties have adopted legislation that is stricter than the applicable state or federal regulations. Permittees wishing to develop in certain counties must then comply with the county requirements in addition to the state and federal requirements. Examples of counties that have adopted banking programs include DuPage County, Illinois; King County, Washington; and Pierce County, Washington.

In addition to the state and federal authorities governing the establishment of wetland mitigation banks, at least one nonprofit organization, The Nature Conservancy, has developed internal guidelines to govern its establishment and administration of wetland mitigation projects, including banks.[142] These guidelines obviously cannot supplant federal and state authorities, but instead are meant to ensure that the assumed projects further the conservation objectives of the organization.

### Bank sponsors

State statutes, regulations, and guidelines address the types of banks that may be established and the types of mitigation that may occur at these banks. Of the 23 states with statutes or regulations addressing wetland mitigation banks, 12 allow public and private entities to sponsor banks, as does the federal guidance.[143] Six states have guidelines that allow public and private entities to sponsor banks.[144] Five states have state statutes or regulations that only authorize a public entity to sponsor a bank.[145] Minnesota has guidelines that only authorize publicly owned banks, and New Jersey has a statute that allows only privately owned banks.

In addition to addressing the types of entities that may sponsor a bank, a few states have also addressed explicitly whether banks may be located on public or private lands. Michigan has a regulation that allows banks to be sited on either public or private lands, and Colorado, Iowa, and Minnesota have guidelines that authorize this as well. Minnesota's guidelines further clarify that if public land is used for a bank, the value of the land rights and public contributions must be factored into the sale price of the credits.[146] Illinois has guidelines that allow banks to be sited only on public lands.

### Limitations on mitigation methods

The federal guidance allows banks to accomplish their mitigation requirements through restoration, creation, enhancement, and in exceptional circumstances, preservation. Some of the state statutes, regulations, and guidelines expand upon or limit these options. For example, Minnesota's statutes and Iowa's guidelines only authorize the use of restoration and creation. In total, seven states have statutes or regulations that do not allow for preservation banking; one state, Iowa, has guidelines that do not allow for preservation.[147] Louisiana and Illinois have expanded the options for mitigation methods. Louisiana's statute allows preservation even in the absence of exceptional circumstances.[148] Illinois allows restoration, creation, preservation, and research.[149]

### Service area

State statutes, regulations, and guidelines may limit the area from which a bank may accept credits for impacts. Thirteen states have statutes or regulations that define the service area of the bank.[150] Seven states have guidelines that limit the service area of the bank.[151] Limits may be tied to a wetland planning region, as in Arkansas, or within the same watershed as the bank, as in Indiana. In contrast, Mississippi's statute authorizes the Mississippi Transportation Commission to acquire credits for its impacts anywhere within Mississippi and even outside of Mississippi.[152]

### In-kind vs. out-of-kind

Some state statutes, regulations, and guidelines also require that the compensatory wetland mitigation be in-kind. Ten states have a statute or regulation[153] and

[142] The Nature Conservancy. *Mitigation Guidelines*. 24 May 1990; The Nature Conservancy. *The Nature Conservancy's Wetlands Mitigation Banking Guidelines*. 1998; The Nature Conservancy. *Standards and Guidelines for Compensatory Mitigation Projects of The Nature Conservancy*. 10 Jan. 2002.

[143] California, Florida, Louisiana, Maine, Maryland, Michigan, Nevada, North Carolina, Oregon, Tennessee, Washington, and Wisconsin.

[144] Colorado, Georgia, Idaho, Indiana, South Carolina, and Virginia.

[145] Arkansas, Illinois, Kentucky, Nebraska, and Texas.

[146] Minnesota Board of Water & Soil Resources. *Guidelines for Wetland Banking Minnesota Wetland Conservation Act*. 16 Mar. 1994.

[147] Kentucky, Maryland, Minnesota, New Jersey, Oregon, Wisconsin, and Wyoming.

[148] La. Rev. Stat. Ann. §49:214.41(A).

[149] 20 Ill. Comp. Ann. Stat. 830/3-6.

[150] Arkansas, Florida, Louisiana, Maine, Maryland, Michigan, Minnesota, New Jersey, Ohio, Virginia, Washington, Wisconsin, and Wyoming.

[151] Colorado, Georgia, Idaho, Indiana, Iowa, Missouri, and South Carolina.

[152] Miss. Code §65-1-51.

seven states have guidelines that require in-kind mitigation.[154]

State statutes, regulations, and guidelines may contain other requirements to limit the use of banks. For example, Maine's regulations limit the use of banks by a single entity to 25 acres of wetland alteration per year.[155] The guidelines in Minnesota state that the use of banks should generally be limited to linear-type transportation projects or utility projects that impact less than five acres per basin, or other projects with impacts of less than five acres.[156]

State statutes, regulations, and guidelines address additional areas of wetland mitigation banking, such as financial assurances, replacement ratios, and credit definitions. These provisions are referenced throughout the report in the appropriate sections.

[153] California, Maine, Maryland, Michigan, Nebraska, New Jersey, Ohio, Oregon, Wisconsin, and Wyoming.

[154] Hawaii, Idaho, Iowa, Minnesota, Missouri, South Carolina, and Virginia.

[155] 310 Code Me. R. §7.

[156] Minnesota Board of Water & Soil Resources. *Guidelines for Wetland Banking Minnesota Wetland Conservation Act.* 16 Mar. 1994.

# IV. THE STATUS OF WETLAND MITIGATION BANKING

The information and data presented in this section refer only to wetland mitigation banks. Information on mitigation sites approved under umbrella banking instruments is discussed in section V.

## GENERAL INFORMATION

The use of mitigation banks as compensation for permitted wetland impacts under §404 of the CWA has seen a considerable increase in the past decade. ELI's 1993 study of wetland mitigation banking in the United States found that there were only 46 approved banks by July 1992. ELI's current survey has documented 219 approved banks, 197 of which are active and 22 of which are sold-out (see box "Bank status definitions"). This represents a 376 percent increase in the number of wetland mitigation banks in the country in only 10 years.[157] In addition, there are eight banks that are approved but inactive, at least 95 banks pending approval, and one bank that has expired. Despite this significant increase in wetland mitigation banking in the past 10 years, the dominant form of compensatory mitigation continues to be permittee-responsible mitigation. Wetland mitigation banking and other forms of third party or off-site compensatory mitigation are the exception rather than the rule.[158]

Due to the difficulty in obtaining information on inactive, pending, and expired banks, the analysis in section IV. "The Status of Wetland Mitigation Banking," refers to the 219 approved banks, for which documentation was available or verified.

At least 139,000 acres have been approved under wetland mitigation banking agreements in the United States.[159] Although some of this acreage is represented by wetland restoration, creation, enhancement, or preservation, some may include non-wetland acreage. An additional 8,000 acres are pending approval. By comparison, only 17,664 acres were included in wetland mitigation banks in 1992.[160]

The size of individual wetland mitigation banks range from the largest at 23,922 acres (Farmton Mitigation Bank in Florida) to the smallest at six acres (ODEC—Virginia Power Bank in Virginia and McHugh Wetland Bank in Washington).[161] In 1992, the vast majority of the banks were less than 100 acres with 50 percent of the total number of banks less than 40 acres. While a substantial percentage of banks continue to be less than 100 acres, the percentage of banks over 100 acres has risen from 35 percent in 1992 to 57 percent in 2001.[162] The highest concentration of small banks is in Illinois where 20 of the state's 21 banks are

**BANK STATUS DEFINITIONS**

**Approved-active**—an approved bank that is authorized to sell credits.

**Approved-sold-out**—an approved bank that has sold all of its credits.

**Approved-inactive**—an approved bank that is currently not authorized to sell credits due to a failure to meet performance goals, the expiration of financial assurances, or other such factors.

**Pending**—a bank with a prospectus that has been submitted to the appropriate agency.

**Expired**—a bank that has been formally approved by the appropriate agency, but is never constructed and has not generated credits for sale.

[157] ELI identified existing banks (approved-active and approved-sold-out) and pending banks from November 2000 through December 2001. In December 2001, the list of banks were verified with Corps districts and state regulatory programs. For the sake of consistency, this report uses a cut-off date of December 2001 to assure consistency in the data.

[158] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act.* Washington, D.C.: National Academy Press, 2001. 86.

[159] The 204 wetland mitigation banks that provided information on acreage represent 139,896 acres. There are 15 active banks, however, for which acreage information was not available.

[160] *Wetland Mitigation Banking.* Washington, D.C.: Environmental Law Institute, 1993. Appendix B.

[161] Environmental Management Systems, Inc. *Individual Environmental Resource Permit Technical Staff Report.* Permit. Volusia and Brevard Counties, 2000. 1; Mc Hugh, Joseph Scott. *Pacific County and Mchugh Wetland Mitigation Agreement.* Banking Instrument. Pacific County, WA. 2001. 1; Old Dominion Electric Cooperative and Virginia Electric and Power Company. *Memorandum of Agreement between Old Dominion Electric Cooperative and Virginia Electric and Power Company and U.S. Army Corps of Engineers Norfolk District to Establish a Wetland Bank for Wetland Losses in the Roanoke River Basin.* MOA. Halifax County, WA. 1997. 4.

[162] In 1992, 11 of the 46 banks (24 percent) were between 100 acres 1000 acres, 65 percent of the banks were less than 100 acres, and only 10 percent (five banks) were over 1000 acres. Of the 204

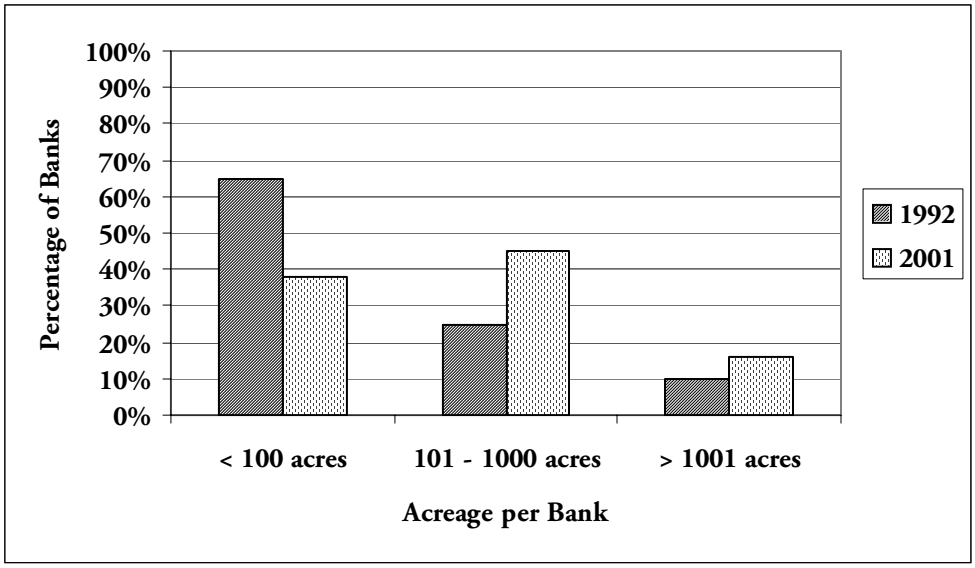


**FIGURE 1.** Change in the percentage of banks between 1992 and 2001 with sizes less than 100 acres; between 101 and 1000 acres; and greater than 1001 acres.

less than 100 acres and 57 percent of these are less than 50 acres. In comparison, 53 percent of the banks in Florida are over 1,000 acres. Other states with notably large banks are Texas, where 45 percent of the banks are over 1,000 acres and all but one bank has over 100 acres, and Alabama, where all three banks in the state are over 500 acres and two of the three are over 1,000 acres. It is unclear whether or not the size of the wetland mitigation banks in different areas of the country are designed to reflect the relative size of naturally occurring wetlands in the area.

## GEOGRAPHICAL DISTRIBUTION

In 2001, wetland mitigation banks were found in 40 states, in contrast to 1992 when banks were present in only 18 states. Banks are scattered across the entire United States and every region has at least one operating bank. Not surprisingly, the southeastern United States, an area with one of the highest concentrations of wetlands, also includes the highest concentration of wetland acreage in banks.[163] Nine southeastern states—Alabama, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, and Tennessee—have 92 banks with over 104,000 wetland acres in banks. Altogether, 74 percent of the total U.S. wetland acreage in banks is in the southeast.

The amount of wetland acreage in a state does not, however, always reflect the number of banks in a given state. For example, one-fourth of the state of Maine is covered in wetlands, yet the state does not have a single bank.[164] Likewise, Connecticut does not have any operating banks despite the fact that five percent of the state's acreage is wetland. The northeast U.S. has the fewest number of approved banks in the country. In total, the northeast—Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont—has only one approved bank—Rochester's Cornerstone Group-Rochester International Commerce Center Wetland Mitigation Bank in New York,[165] which is only 20 acres.[166]

Of the 40 states with wetland mitigation banks, Florida has the largest number of banks as well as the greatest amount of wetland acreage in banks (see box "Florida: Why so many?"). There are 34 approved banks in the state that include more than 50,050 wetland acres. Other states with significant numbers of banks include

banking instruments that contain bank acreage today (2002), 45 percent of the banks (or 93) are between 100 and 1,000 acres with 38 percent (or 79 banks) less than 100 acres, and 16 percent (or 33 banks) are over 1,000 acres.

[163] Dahl, T.E. *Status and Trends of Wetland in the Conterminous United States 1986 to 1997.* United States Department of the Interior, Fish and Wildlife Service. Washington, D.C.: Department of the Interior, Fish and Wildlife Service, 2000.

[164] United States Geological Survey. *National Water Summary on Wetland Resources.* Water-Supply Paper 2425. Washington, D.C.: United States Government Printing Office, 1996. 213.

[165] Rochester's Cornerstone Group-Rochester International Commerce Center LLC. *Rochester's Cornerstone Group-Rochester International Commerce Center, Limited Liability Company Mitigation Banking Agreement.* Banking Instrument. Monroe County, NY. 1998.

[166] Additionally, Massachusetts has an umbrella agreement established for the creation of banks, however, it has yet to approve any sites for debiting.


**FIGURE 2:** Number of approved wetland mitigation Banks in each state.

Georgia, Illinois, and California, which have 25, 21, and 16 approved banks, respectively.

### Historic land use

Between 1986 and 1997, 30 percent of all wetland loss was attributed to urban development, 26 percent to agriculture, 23 percent to silviculture, and 21 percent to rural development.[167] This study did not permit a thorough examination of where lost wetland acreage was being mitigated. Wetland banking instruments do, however, often note the historical use of the land on which banks are established. This information provides a cursory look at where banks are being located. An examination of where mitigation banks are sited revealed that, of the 109 banking instruments with historical land use information, over 65 percent of the banks are sited on land previously used for agriculture. During interviews, a number of wetland program managers voiced concern over the lack of attention to where banks are created in relation to where permitted wetland impacts occur. State wetland program officials in Ohio indicated they are now beginning to evaluate bank siting more closely because the state's banks tend to be sited in rural areas where land is inexpensive rather than close to the permitted impacts.[168]

## CHANGES IN BANK TYPE, TYPE OF BANK SPONSORS, AND TYPE OF BANK CLIENTS

Perhaps one of the most significant changes in wetland mitigation banking in the past decade has been the evolution of banking as a private enterprise. In the early 1990s, nearly 75 percent of the nation's existing banks were sponsored by state highway agencies, port authorities, or local governments—in other words, they were single-user banks.[177] Although single-user banks sponsored by state departments of transportation and other banks created for public-works projects continue to be widespread, today the dominant bank type is the private commercial or entrepreneurial bank. In 1992, there was only one private commercial bank in operation, or two percent of the total number of banks. Today there

[167] Dahl, T.E. *Status and Trends of Wetland in the Conterminous United States 1986 to 1997.* United States Department of the Interior, Fish and Wildlife Service. Washington, D.C.: Department of the Interior, Fish and Wildlife Service, 2000. 10-11.

[168] Ohio Environmental Protection Agency. Telephone Interview. 7 Feb. 2001.

[169] United States Geological Survey. *National Water Summary on Wetland Resources*. Water-Supply Paper 2425. Washington, D.C.: United States Government Printing Office, 1996.

[170] *U.S. Census Bureau Quick Facts*. United States Census Bureau. 10 March 2002. <http://quickfacts.census.gov/qfd/states/12000.html>

### FLORIDA: WHY SO MANY?

Florida's wetland mitigation banking program—in terms of the number of banks and the acreage of wetland in banks—is the largest in the United States. A number of factors likely contribute to the size of Florida's banking program: amount of wetland acreage in the state, the rate of population growth and corresponding development pressure, and the maturity of the state's mitigation banking program.

Since the 1700s, over half of Florida's wetlands have been destroyed. Nonetheless, Florida has the largest total wetland acreage in the conterminous United States with approximately 11 million wetland acres.[169] For decades, Florida has also experienced a population boom not to be rivaled. In the 1990s, Florida had a 23.5 percent increase in population, 10 percentage points higher than the national average.[170] Florida's population growth has brought with it a demand for development of all kinds. Due to the higher relative acreage of wetlands, land development is more likely to impact wetland area, necessitating more mitigation and therefore creating greater demand for wetland mitigation bank credits.

These factors do not fully explain the size of Florida's wetland mitigation banking program. The state statutes and guidelines governing wetland mitigation, the program's maturity, and the supply of wetlands and the demand for land together create a more complete picture of why Florida's mitigation banking program is the largest. In 1989, the Department of Environmental Protection approved rules governing the use of compensatory mitigation. Although the rules did not specifically address mitigation banking, they included provisions allowing for the preconstruction of mitigation, which allowed for the use of mitigation banking.[171] Four years later, the Florida legislature passed the Florida Environmental Reorganization Act, mandating the Department of Environmental Protection and its sister agencies to jointly develop and adopt rules on mitigation banking. Florida's wetland mitigation banking rules became effective in early 1994.[172] These rules establish criteria for the establishment of banks, providing clarity for the bank sponsor on the requirements for bank establishment. In addition, an interagency team comprised of state and federal agencies began meeting in 1995 to develop guidance on streamlining the mitigation bank review team (MBRT) process for Florida. The team developed a draft guidance document in 1997 on standard procedures for bank crediting and debiting. The relative clarity of Florida's rules combined with the maturity of the state's program, the streamlined MBRT process, and the demand for bank credits has created a secure climate for the establishment of wetland mitigation banks in the state.

### NEW ENGLAND: WHY SO FEW?

The New England states include a sizable portion of the total acreage of wetlands in the United States.[173] Yet this survey found only one wetland mitigation bank in the seven northeastern states, which include Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. The absence of banks in this region is most likely due to two related reasons: a lack of demand for mitigation credits and small service areas.

The rise of commercial mitigation banking is driven by the need for mitigation credits combined with the knowledge that the credits produced by a bank will satisfy mitigation requirements. The larger the bank's service area, the more likely it is that there will be demand for the credits generated. In New England states, many of which have their own state wetland programs, many states have based their service areas on small watersheds. This is particularly true in Connecticut and New Hampshire. In Connecticut, each of the state's 169 municipalities has the authority to regulate mitigation banking.[174] In essence, each of these municipalities represents its own service area. In New Hampshire, wetland mitigation bank credits can only be used for impacts that occur within the same watershed as the bank. The state has defined 110 individual watersheds.[175] Small service areas and the potential for dissimilar rules for bank establishment from municipality to municipality make banking a less attractive compensatory mitigation option in these states.

In many of the other northeastern states where service areas are not an issue, the demand for mitigation credits does not exist. New York, Rhode Island, and Vermont state wetland officials indicated that there are few or no banks in their states because the demand for mitigation credits is marginal to non-existent. Rhode Island, for example, only had 0.29 acres of permitted wetland losses in 1999 and 3.3 acres in 1998. With such small permitted losses, the state does not view the development of a mitigation banking program as a priority.[176]

are 135 private commercial banks, or 62 percent of the total. Of the 214 approved wetland mitigation banks that indicate bank type, 135 are private commercial, 61 are single-user, 12 are public commercial, five are a combination public-private commercial, and one is a public bank (see figure 3 and section III. "Bank basics").[178]

The breakdown of bank sponsors reflects the distribution of bank types. Today, 145 banks—the major-

[171] Redmond, Ann, Terrie Bates, Frank Bernadino, and Robert M. Rhodes. "State Mitigation Banking Programs: The Florida Experience." *Mitigation Banking: Theory and Practice.* Ed. L. Marsh, D. Porter, and D. Salvesen. Washington, D.C.: Island Press, 1996. 56.

[172] Goode, Ann Eberhart. "State Mitigation Banking Policies." *National Wetlands Newsletter.* 20:6 (1998): 8.

[173] Dahl, T.E. *Status and Trends of Wetland in the Conterminous United States 1986 to 1997.* United States Department of the Interior, Fish and Wildlife Service. Washington, D.C.: Department of the Interior, Fish and Wildlife Service, 2000.

[174] Connecticut Department of Environmental Protection. Telephone Interview. 13 Feb. 2001.

[175] New Hampshire Department of Environmental Services. Telephone Interview. 7 Feb. 2001.

[176] Rhode Island Department of Environmental Management, Wetland Policy. Telephone Interview. 13 Mar. 2001.

[177] *Wetland Mitigation Banking.* Washington, D.C.: Environmental Law Institute, 1993.

[178] Banking instruments for five of the 219 approved banks do not indicate the sponsor type.

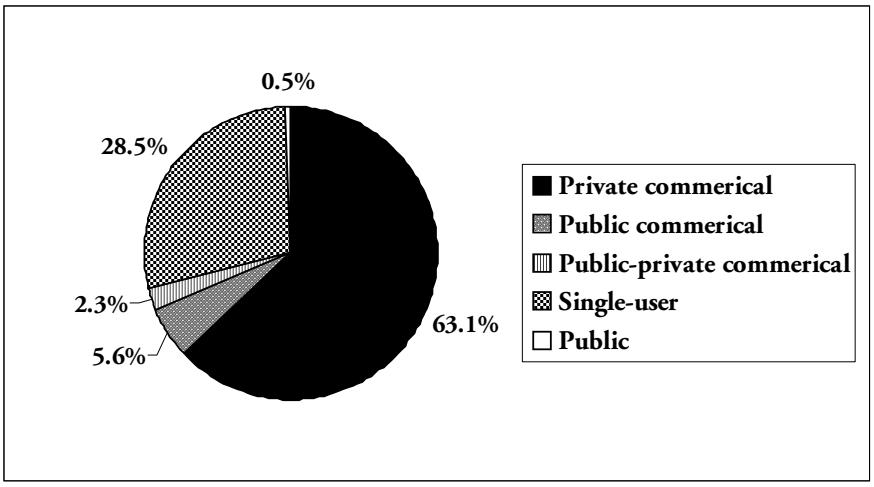


**FIGURE 3.** Proportions of wetland mitigation banks that are private commercial, public commercial, combination public-private commercial, single-user, or only public.

ity of wetland mitigation banks—are sponsored by private entities. Fifty-four are sponsored by public agencies, nine by private non-profit groups, and five are sponsored by a combination of public and private entities (see figure 4).

### Private commercial banks

Private commercial banks are those sponsored by a private entrepreneur or private non-profit organization with credits available for sale on the open market. The marked rise in the establishment of private commercial banks is attributable to two principal factors: mitigation banking guidance issued by federal agencies in 1993 and 1995 and the amount of capital available to the private entrepreneur. ELI's 1993 study noted that the biggest impediment to the establishment of entrepreneurial banks was the lack of consistency in permitting and mitigation decisions that would allow the market to produce an appropriate number of credits with a reasonable expectation of return. This impediment to commercial banking was in effect removed through the issuance of 1995 banking guidance. The federal guidance, as well as a number of subsequent state guidances and legislation on the establishment and use of banks, lent a degree of consistency and predictability to the mitigation banking market.

In addition, the vast majority of private mitigation bankers now have access to the capital necessary to establish a bank through the sale of credits in advance of the bank reaching maturity, providing additional incentives for the establishment of private commercial banks (see section IV. "Credit release"). The availability of capital removed many of the disincentives created by the high costs of establishing a bank. Nonetheless, a significant investment is still required to create a bank.

The vast majority of private commercial bank sponsors are private, for-profit entities. Seven private commercial banks, however, are sponsored by private non-profit organizations, such as The Nature Conservancy. The small number of banks sponsored by non-profit groups may be attributed to the controversial nature of wetland mitigation banking. The range of private sponsors for private commercial banks does not lend itself to easy categorization. These banks span the gamut from small banks sponsored by private landowners seeking to make a profit to private companies created solely for the purpose of creating wetland mitigation banks. Some private commercial banks are established to meet a sponsor's own compensatory mitigation requirements with any excess credits being sold to other permittees. For example, Ohio Edison Grand River Mitigation Bank in Ohio, aims to use the first seven of the total number of credits generated in the bank to comply with mitiga-

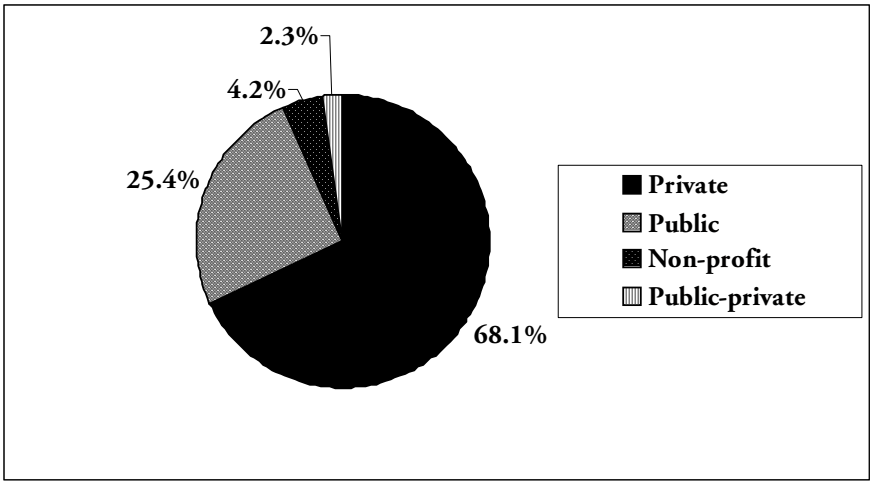


**FIGURE 4.** Proportions of wetland mitigation banks with private, public, non-profit, or combination public-private bank sponsorship.

tion requirements stemming from a §404 Corps permit and will make the remaining credits available for sale to the general public.[179]

Credits generated from private commercial banks are sold on the open market and are generally designated as credits for "general use." Seventy-eight percent, or 106 of the 135 private commercial banks, are general use banks. Although private commercial banks now outnumber single-user banks, public works agencies may be the principal purchasers of credits from private commercial banks. For example, the Tennessee Department of Transportation purchased all of the credits available for advance debiting in two of Tennessee's three private banks. The agency prefers to buy private credits to offset its wetland losses.[180]

### Single-user banks

Single-user banks are those for which the sponsor is also the sole credit user or client. These banks are assured of a market, as the sponsor is the entity creating demand. Although the largest percentage of single-user bank sponsors are public agencies, a number of private entities have created single-user banks as well. The majority of single-user banks are sponsored by the same entity that undertakes the debiting activities. However, it is common for state department of transportation banks to be managed by another state entity, such as the state of fish and wildlife agency. Of the 61 single-user banks, 31 are operated by state departments of transportation. An additional 13 single-user banks are sponsored by other public agencies. The remainder of the single-user banks (17) are sponsored by private enterprises. Although Florida has the highest number of single-user banks—11 in all—these banks only make up 35 percent of the total banks in the state. All of the banks in Arkansas and Idaho, five and two respectively, are single-user banks.

### Public commercial, combination public-private commercial, and public banks

Public commercial banks, combination public-private banks, and public banks remain the least common bank types. Public commercial banks are those sponsored by a state agency, such as a state department of fish and game or a county, which sell credits on the open market. Public banks are banks sponsored by a federal, state, or local entity that sell credits only to other public agencies. Of these bank types, there are 12 public commercial banks, five combination public-private banks, and one public bank. Half of the public commercial banks and two of the five combination public-private banks designate bank credits for general use. The remaining banks either did not provide information on the credit users or indicate specific groups that may debit the bank.

Much of the increase in mitigation banking in the United States from 1992 to 2001 can be attributed to the activity of private sponsors. Whether creating a single-user bank for personal debiting or, more commonly, a private commercial bank for general debiting, private sponsors have seized an opportunity to profit from a new market. The number of public single-user banks on the other hand has not significantly increased. Similarly, public commercial banks and combination public-private banks remain rare likely due to the fact that they compete with private commercial banks for clients and do not have equal access to capital.

## BANK SITING

Where a bank is sited strongly determines whether the project will be capable of producing ecologically effective compensatory mitigation. Landscape characteristics directly affect its potential to support and maintain adequate and appropriate wetlands hydrology, hydric soils, hydrophytic vegetation, and wildlife species and to provide desired services, such as flood control and water quality.[181] Factors such as the degree of site degradation and its compatibility with adjacent land uses also affect the bank's ability to replace lost wetland functions.[182]

Detailed siting criteria are generally not outlined in the majority of bank authorizing instruments. Nor are they consistently found in banking guidance and statutes issued by regulatory agencies.[183] Only ten states have statutes, regulations, or guidelines that outline bank siting criteria: Arkansas,[184] California,[185] Colorado,[186]

[179] Ohio Edison Company. *Department of the Army Permit Number 94-492-7*. Permit. Farmington Township, OH. 1996. 5.

[180] Nashville district, Army Corps of Engineers. Telephone Interview. 21 Nov. 2000.

[181] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act*. Washington, D.C.: National Academy Press, 2001. 47.

[182] *Id.* at 35, 49.

[183] Siting criteria were not systematically reviewed in our analysis of authorizing instruments, in large part because such information was not consistent and readily apparent within banking instruments and permits.

[184] Ark. Reg. §1203.2.

[185] Cal. Fish & Game Code §1784.

[186] *Guidance to Colorado Division of Wildlife Staff on the Establishment, Use and Operation of Mitigation Banks in Colorado*. 1 Nov. 2000.

Florida,[187] Georgia,[188] Indiana,[189] Iowa,[190] Maryland,[191] South Carolina,[192] and Virginia.[193] Authorizing instruments and state policies may use siting criteria to help steer projects toward particular land types (e.g., prior converted croplands or former historic wetlands), in particular watersheds (e.g., those with intense development pressures or high impacts), and to areas with compatible adjacent land uses (e.g., adjoining to publicly protected areas). Siting criteria can also be used to prioritize the location of banks according to the wetland functions and values deemed most vital to specific regions or watersheds and that meet regional, state, or local planning goals.

Minnesota's geographic service area definition reflects certain siting goals. According to its wetland banking guidelines, if a bank is in a county with less than 50 percent of pre-settlement wetlands, then the bank can mitigate for impacts throughout the state. Banks in counties with greater than 80 percent of pre-settlement wetlands remaining may sell credits only for impacts within the same county or major watershed.[194] Georgia uses credit ratios to steer bank siting—the state authorizes a lower credit ratio if credits are withdrawn from a bank in a high growth county as opposed to one in a rural county.[195] Although these stipulations may help guide banks to certain localities, in the end, bank sponsors may still have a lot of flexibility in locating bank sites.

**BANK SITING CRITERIA**

Below are examples of bank siting criteria found in banking statutes, regulations, guidelines and authorizing instruments. Bank siting criteria may require that banks be established on:

- Historic wetland sites;
- Previously drained or degraded sites of certain wetland types (e.g., forested or riparian wetlands);
- Sites with reliable, adequate, and available water supply necessary to provide for proposed wetland functions and values;
- Sites situated within the landscape such that self-sustaining hydrology can be ensured;
- Sites containing majority of drained or hydrologically modified hydric soils;
- Sites with predominately hydric or hydrologically modified soils;
- Sites in close proximity to designated priority areas, such as state management areas, public lands, preserves;
- Sites connected to existing wetland systems and/or areas of wildlife significance;
- Sites with sufficient distance from incompatible land uses and/or urban or populated areas that may reduce long-term wetland functioning;
- Sites that contain adequate associated upland areas to serve as a wetland buffer;
- Sites in which construction will not adversely affect ecologically significant aquatic or upland areas, cultural sites, or habitat for threatened and endangered species; or
- Sites that will enhance habitat and species diversity, outdoor recreation, and scientific and research values.

### Ecological suitability and significance

According to the 1995 banking guidance, the ecological suitability of a compensatory mitigation site for replacing lost aquatic functions should be considered during the development phase.[196] Ensuring adequate hydrologic sources is essential since "hydrology is the driving force influencing wetland development, structure, function, and persistence."[197] The wetland hydrology of a site in large part is determined by its landscape

[187] Fla. Stat. ch. 373.4136.

[188] U.S. Army Corps of Engineers, Savannah district; U.S. Environmental Protection Agency, Region IV; U.S. Fish & Wildlife Services, Southeast Region; and Georgia Department of Natural Resources. *Guidelines on the Establishment & Operation of Wetland Mitigation Banks in Georgia*. 1995. See <http://www.sas.usace.army.mil/bankguid.htm>.

[189] Mitigation Banking Review Team. *Interagency Coordination Agreement on Wetland Mitigation Banking within the State of Indiana*. See <http://www.lrl.usace.army.mil/orf/info/ICA1097.html>.

[190] Mitigation Banking Review Team. *Technical Guidance for Wetland Mitigation Banking in Iowa*.

[191] Walbeck, D. and D. Clearwater. *Maryland Nontidal Wetland Mitigation Guidance*. National Wetlands and Waterways Division. July 1998. See <http://www.mde.state.md.us/wetlands/mitguide.htm>.

[192] Mitigation Banking Review Team. *Joint State/Federal Administrative Procedures for the Establishment and Operation of Wetland Mitigation Banks in South Carolina*. July 1996.

[193] Virginia Marine Resources Commission and Virginia Institute of Marine Science. *Guidelines for the Establishment, Use and Operation of Tidal Wetland Mitigation Banks in Virginia*. See <http://www.state.va.us/mrc/guideli.htm>.

[194] Minnesota Board of Water & Soil Resources. *Guidelines for Wetland Banking Under Minnesota Wetland Conservation Act*. 16 Mar. 1994.

[195] U.S. Army Corps of Engineers, Savannah district; U.S. Environmental Protection Agency, Region IV, U.S. Fish & Wildlife Service, Southeast Region, and the Georgia Department of Natural Resources. *Guidelines on the Establishment & Operation of Wetland Mitigation Banks in Georgia*. 1995. See <http://www.sas.usace.army.mil/bankguid.htm#policy>.

[196] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995.

[197] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act*. Washington, D.C.: National Academy Press, 2001. 37.

position, which influences topographic characteristics, soil permeability and composition, and hydraulic properties of the underlying strata.[198] The likelihood of establishing sustainable hydrology may be increased by identifying reference wetlands on a landscape or basin wide scale to be used as templates from which to design and establish banks.[199] According to the banking instruments reviewed, however, reference wetlands have not been widely used to guide bank siting.

Ecological suitability and significance of a bank site is not consistently and adequately documented in authorizing instruments, but is addressed in some. The banking instrument for WetBank-Gunnison Bank in Colorado indicates that the site was selected due to the ecological, topographical, and geographical attributes necessary for wetland restoration. Considerations regarding its location included: 1) presence of a majority of drained, hydric soils, 2) avoidance of impacts to high-quality wetland and aquatic resources and threatened and endangered species as a result of bank establishment, 3) associated upland areas to act as a buffer and to provide habitat diversity, 4) proximity to public lands to enhance migratory corridors, and 5) provision of open space.[200]

Florida consistently requires suitability information to be clearly specified in banking instruments and permits. Under the Florida Environmental Reorganization Act of 1993, bank sponsors must provide reasonable assurance that the proposed bank will 1) improve ecological conditions of the regional watershed, 2) provide viable and sustainable ecological and hydrological functions, 3) be compatible with adjacent land uses, and 4) be effectively managed in perpetuity.[201] As a result, information on the ecological importance and suitability of bank sites is outlined in Florida authorizing instruments in the form of functional assessments, wildlife utilization (particularly by threatened and endangered species) analyses, or designations of importance by state agency programs or scientific studies.

Similarly, California instituted its State Policy on Conservation Banking in 1995 to encourage the creation or restoration of banks on lands that conserve important habitats or habitat linkages. This policy requires that an authorizing agency (such as the Department of Fish and Game) formally approve the proposed bank site and associated management plan to verify that the site possesses habitat value of regional significance and is worthy of restoration or permanent protection.[202]

The lack of adequate information on the ecological suitability of bank sites in authorizing instruments likely results in a decreased ability of regulatory agencies to effectively evaluate the long-term sustainability of proposed mitigation projects. Adopting standards for the type of ecological information that must be provided prior to bank approval may improve the ability of agencies to assess site suitability (see box "Bank siting criteria"). New Jersey has adopted such an approach by developing minimum submission standards, which require bank sponsors to submit information on the suitability of sites, such as projected water budgets, soil and substrate profiles, and descriptions of how proposed sites interact with surrounding regional wetland and aquatic resources (see section IV. "Design standards").

### Watershed planning

To improve the ability of compensatory mitigation to establish wetland functions, mitigation sites should be identified in the context of a watershed or landscape plan.[203] The adoption of a watershed approach may guide regional mitigation decision-making based on known historic wetland ranges, existing and reference wetland conditions, identified threats to aquatic ecosystems and functions of concern, and itemized restoration needs and goals.[204]

Recent studies recommend that bank planning and establishment decisions be based on regional watershed

[198] *Id.* at 47.

[199] Brinson, M. and R. Rheinhardt. "The Role of Reference Wetlands in Functional Assessment and Mitigation." *Ecological Applications* 6:1 (1996): 69-76.

[200] Still Water — Ohio Creek, LLP. *Banking Instrument for the WetBank-Gunnison.* Banking Instrument. Gunnison County, CO. 1999.

[201] Fla. Admin. Code. Ann. r. 62-342.400; Olsen, E. "Mitigation Banking Under the Florida Environmental Reorganization Act of 1993." *Florida Bay Journal* 68: (July/August 1994): 1-6; Salvesen, D. *Wetlands Mitigation Banking: Florida's Efforts.* ULI Policy Forum Series 637. Washington D.C.: Urban Land Institute, (Jan 25) 1994.

[202] Wheeler, D. and J. Strock. *Official Policy on Conservation Banks.* The Resources Agency and California Environmental Protection Agency. 7 Apr. 1995. See <http://ceres.ca.gov/wetlands/policiesmitbank.html>.

[203] Foote-Smith, C. "Restoration in a Watershed Context." *National Wetlands Newsletter* 18:2 (March-April 1996: 10-13; Rogers, J. "Wetland Mitigation Banking and Watershed Planning." *Mitigation Banking: Theory and Practice.* Ed. L. Marsh, D. Porter, and D. Salvesen. Washington, D.C.: Island Press, 1996. 159-183; National Research Council. *Compensating for Wetland Losses Under the Clean Water Act.* Washington, D.C.: National Academy Press, 2001.

[204] Perez, J., D. Halterman, L. Hodory, and D. White. *A Guide to Developing Local Watershed Action Plans in Ohio.* Ohio Environmental Protection Agency, Division of Surface of Water, 1997.

assessments.[205] This approach better ensures that projects are sited and designed to address specific resource needs and to guarantee a broader array of wetland functions.[206] In addition, conducting compensatory mitigation on a watershed scale may help "maintain wetland diversity, connectivity, and appropriate proportions of upland and wetland systems needed to enhance the long-term stability of wetland and riparian systems."[207]

Several researchers have proposed models to guide regional wetland planning, such as the strategy for southern California's coastal wetlands and the framework for defining hydrologic equivalence for freshwater wetlands on a landscape scale.[208] In 1994, Massachusetts established a wetlands restoration and banking program to implement a more proactive, watershed-based planning process for identifying and evaluating potential wetland restoration sites in the state.[209] Such regional approaches may allow for the assessment of cumulative impacts of individual mitigation projects on a landscape scale. They may also help integrate watershed planning with other landscape or land use planning efforts to better ensure that the banking program is consistent with local, regional, or state water quality or floodplain management plans, and with comprehensive development, open space, or green infrastructure planning.[210]

Despite the support of watershed planning by both the scientific community and regulatory agencies, only 11 of the of the 219 approved banking instruments indicate that the bank siting is consistent with larger environmental planning efforts, such as state coastal, watershed, or wildlife management plans, or local comprehensive planning and zoning ordinances.[211] Only two states—Michigan and North Carolina—explicitly require that mitigation sites be planned in a watershed context in their banking statutes or regulations.[212] Bank siting procedures adopted by regulatory agencies to approve mitigation site selection, however, are not routinely captured in bank authorizing instruments and may not be well reflected in banking statutes and regulations. Nonetheless, the absence of a connection between bank siting and larger-scale planning efforts raises concern that states and the Corps may not have adequately applied a watershed approach to wetland mitigation banking programs to date.

### Private vs. public ownership

Ownership of the land on which a bank is sited influences monitoring and enforcement, maintenance, and long-term management of the site, as well as how credits are priced.[213] According to Corps policy, banks may be established on public or private lands. However, those sited on public lands—such as on federal, state, tribal, or locally-owned resource management areas—should ensure that resulting mitigation does not displace public restoration efforts that would have otherwise occurred, and that the credits generated are based solely on additional ecological values rather than values provided by existing conservation or planned public programs (see section III. "Bank siting considerations").[214]

Most states allow banks to be sited on both public and private lands (see section III. "The state regulatory context for wetland mitigation banking"). New Jersey is the only state that legally limits bank siting to privately owned lands, with the exception that they can be sited on public property if the land is acquired expressly for the purpose of wetland mitigation.[215] This require-

[205] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act*. Washington, D.C.: National Academy Press, 2001.

[206] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995; National Research Council. *Compensating for Wetland Losses Under the Clean Water Act*. Washington, D.C.: National Academy Press, 2001. 139.

[207] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act*. Washington, D.C.: National Academy Press, 2001. 59.

[208] Bedford, B. "The Need to Define Hydrologic Equivalence at the Landscape Scale for Freshwater Wetland Mitigation." *Ecological Applications* 6:1 (1996): 57-68; Zedler, J. "Coastal Mitigation in Southern California: The Need for a Regional Restoration Strategy. *Ecological Applications* 6:1 (1996): 84-93.

[209] Foote-Smith, C. "Restoration in a Watershed Context." *National Wetlands Newsletter* 18:2 (March-April 1996: 10-13.

[210] Environmental Law Institute. *Wetland Mitigation Banking*. Washington D.C.: Environmental Law Institute, 1993. 125-140.

[211] Seven banks in Florida, one bank in Alabama, one in Oregon, one in Tennessee, and one in Washington have banking instruments that clearly delineate that the site is consistent or in accordance with regional or state natural resources planning efforts.

[212] Michigan requires that banking be planned in a watershed or ecoregional context and North Carolina requires that banking be consistent with an approved Basinwide Restoration Plan. 12 Mich. Admin. Code r. 281.954 and N.C. Admin. Code tit. 15A, R02.0402.

[213] Environmental Law Institute. *Wetland Mitigation Banking*. Washington D.C.: Environmental Law Institute, 1993. 70.

[214] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995.

[215] N.J. Admin. Code tit. 7, §7A-14.1(f); New Jersey Wetlands Mitigation Council and Department of Environmental Protection. *Wetland Mitigation Bank Proposal: Checklist for Completeness*. Trenton: New Jersey Department of Environmental Protection. 2001.

ment appears to be applied; no banks are located on public local, state, or federal property in New Jersey.

Of the 206 approved wetland mitigation banks that provided data on landownership, the majority (74 percent) are located on private lands. Of these 152 banks, 142 are under corporate or individual private ownership and 10 are under private non-profit ownership. The total area on private lands is approximately 96,336 acres, or 69 percent of the total land area in banks.[216]

The remaining banks are located on public lands: 39 banks on state-owned land, 11 on local government land, and four on federally owned properties. These banks total approximately 43,503 acres, or about 31 percent of total banked lands.[217] Of the 54 banks sited on public lands, only one is a solely public (non-commercial) bank, four are combination public-private commercial, nine are public commercial, seven are private commercial, and 33 are single-user banks.[218] Forty-three of these banks have public sponsors, seven have private sponsors (six private commercial and one non-profit), and four have combination public-private sponsorship. For the small number of banks in which private sector parties are in charge of construction and maintenance of the site, the public entity generally retains land ownership upon bank closure and assumes long-term management responsibilities, as indicated in the conservation easement or deed restriction.[219]

The majority of the banks sited on public lands are sponsored by public agencies. All four of the banks located on federal lands are sponsored by the federal agency; these banks are single-user banks designed to mitigate for the federal landowner's impacts on their respective property.[220] Out of the 11 banks on locally owned lands, six are public commercial, two are single-user, two are private commercial, and one is combination public-private bank. Of the 39 banks on state lands, 28 are single client (predominately sponsored by state departments of transportation), five are private commercial, three are public commercial, and three are combination public-private banks.

> *"The service area of a mitigation bank is the designated area (e.g., watershed, county) wherein a bank can reasonably be expected to provide appropriate compensation for impacts to wetlands and/or other aquatic resources."*
>
> Source: Federal Guidance for the Establishment, Use and Operation of Mitigation Banks. Federal Register, Vol. 60, No. 228. 58605-58614. Tuesday, November 28, 1995.

To help ensure that banks sited on public lands are protected in perpetuity and are not susceptible to a change in land ownership or management, legal assurances should be adopted. Of the 54 banks on public lands, less than half of the authorizing instruments specify the legal assurances for land protection. Of the 25 public banks that do indicate legal assurances, ten adopt restrictive covenants, seven adopt conservation easements, six adopt deed restrictions, one adopts both a conservation easement and deed restriction, and one indicates that some protective real estate mechanism is to be adopted.

As discussed earlier, if a mitigation bank is established on currently held and managed public lands, the mitigation actions do not contribute to the no net loss goal if the wetland mitigation activities would have been carried out by the public agency. However, no effort has been made to date to determine whether or not private mitigation on public lands has displaced public restoration efforts.

## BANK APPROVAL

### The MBRT process

MBRTs are the administrative entities that review, approve, and monitor proposed mitigation bank projects. The MBRT process was first formally defined in the 1995 banking guidance (see section III. "Establishment of mitigation banks").[221] With the issuance of this guidance, the MBRT process became a mandatory

[216] Acreage is noted for 200 of the 206 banks with land ownership information. Of these banks, 96,336 acres are located on private lands and 43,503 acres on public lands. Private non-profit ownership accounts for 1,256 acres.

[217] Of the 31 percent of banked acreage in public ownership, 38,367 acres are on state agency property, 2,676 acres on local government property, and 2,460 acres on federal government property.

[218] Of the 11 banks on local government lands, two banks have private sponsorship (one being by a non-profit). Similarly, eight of the 39 banks on state government lands have banks sponsors from the private sector. None of the banks on federal lands have private sector involvement.

[219] Four of the seven privately sponsored banks sited on public lands indicate within the banking instrument that a conservation easement or deed restriction is granted to the public landowner to help ensure future land protection.

[220] These single-user banks are sponsored by the Department of Energy, U.S. Army, U.S. Marine Corps, and NRCS on their respective lands.

[221] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks.* 60 Fed. Reg. 228, 58605-58614. 1995.

element of creating and managing a federally approved wetland mitigation bank. The MBRT takes the lead in facilitating the "establishment of mitigation banks through the development of mitigation banking instruments."[222]

In addition to the MBRT's role in establishing a mitigation bank, it also serves as an integral part in the management of the bank. Some of these duties include establishment of performance criteria, approval of credit release and sale to permittees, review of maintenance and monitoring reports, oversight of contingency or remediation measures, and monitoring of the overall functioning of the bank site.

**Signatory approval or lack of approval**

The MBRT process of approving a mitigation bank can be lengthy. In some cases, all but one signatory agency will approve the final terms outlined in the authorizing instrument and the process can be stalled until the issue is resolved with the final signatory. During interviews with Corps and state agency representatives, the time-consuming nature of bank approval was noted as one of the weaknesses of the MBRT process. It is inevitable that with a number of different agencies there will be divergent opinions that will not all be easily satisfied by one agreement. In many cases, when one agency disagrees with some aspect of the terms set forth, and a mutually beneficial solution cannot be reached, parties agree to disagree and that agency then removes itself from the process. This allows the bank approval process to move forward, but also may in some cases compromise some aspect or the quality of the agreement.

**Barriers and benefits**

Despite occasional disagreements among signatories, the rigorous review and approval that is inherent to the MBRT process is helpful in several respects. It provides a valuable opportunity to bring together a multi-agency group with often varying environmental objectives to reach consensus. The MBRT process demands in-depth discussions among a diverse group of parties and aims to foster a thorough understanding of the goals and procedures set forth in the authorizing instrument. The group of decision-makers strengthens the process by bringing to the table people with complementary areas of expertise.

While there are many benefits to the MBRT process, Corps districts and state wetland regulatory programs note several drawbacks. For example, much coordination is required to bring the MBRT members together on a regular basis when many of them already have demanding workloads. In addition, the task of participating on the MBRT may be delegated to an agency employee who does not have adequate decision-making authority, which can prolong the decision-making process by weeks or months. As discussed above, reaching consensus is another difficult aspect of the MBRT process.

These drawbacks cause some states to see the MBRT process as a burden or a hurdle to the establishment and use of mitigation banks as a compensatory mitigation tool. For example, according to a Corps district representative in Seattle, after going through the MBRT process one county was frustrated with the process because it took so long to get it off the ground.[223]

In some cases, the MBRT process can take several years to move from the initial proposal phase to the approval of the project. For many states, perceived obstacles of the MBRT process have encouraged them to turn to other forms of compensatory mitigation (i.e., ad hoc in-lieu-fee, consolidated mitigation, project-specific mitigation, or other forms of gray-area mitigation) to satisfy mitigation requirements. The use of ad hoc or gray-area mitigation is discussed further in section VIII. Many states that use MBRTs regularly in their mitigation projects view the use of ad hoc or gray-area mitigation as a loophole in the federal compensatory mitigation program.

### Corps-sponsored banks v. state- and local-sponsored banks

For the most part, wetland mitigation banks are established to generate credits that can be used to satisfy mitigation requirements under §404 of the CWA. As such, the majority of the nation's banks have been approved by the Corps for use in satisfying §404 compensatory mitigation requirements. States or localities may, however, establish wetland banks to meet compensatory mitigation requirements of state or local programs rather than §404. These banks may be approved by the state or local regulatory agency, rather than the Corps. There are a small number of banks in the country that have been approved at the state or local level without Corps involvement. Of the 259 approved banks and umbrella agreements in the country, 37 are state- or locally sponsored. For instance, all 6 of the approved-soldout banks in DuPage County, Illinois are locally

[222] *Id.*

[223] Army Corps of Engineers, Seattle district. Telephone interview. 20 Dec. 2000.

approved and all of the banks in North Dakota have been approved without Corps approval.

In some cases, banks have been established to meet compensatory mitigation requirements under state or local programs but the Corps has decided to approve use of the bank to satisfy §404 permit requirements as well. Washington state banks are one such example. While these banks were established as county-sponsored mitigation banks and are not federally sanctioned, the Corps reserves the right to use these banks on a case-by-case basis. The Corps requires reports on the banks, performance standards, and a ledger.[224]

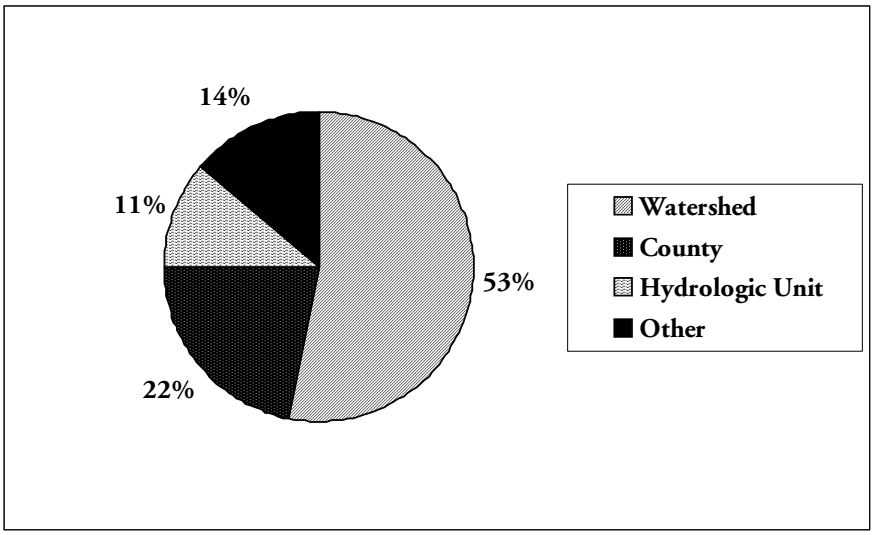


**FIGURE 5.** Proportions of wetland mitigation banks with designated geographic service areas according to watersheds, county boundaries, USGS hydrologic units, or other delineations.

In two states—New Jersey and Michigan—EPA has delegated administration of the §404 program to the state with limited oversight.[225] In these states, the wetland mitigation banking programs differ from banking programs in states where the Corps has the lead jurisdiction in §404 matters. For example, in New Jersey and Michigan, the states do not set up MBRTs or go through the formal processes established by the Corps. Instead, the states rely upon their own administrative guidelines.

## WETLAND MITIGATION BANK GEOGRAPHIC SERVICE AREAS

A wetland mitigation bank's geographic service area is the designated area—such as a watershed or county—that serves as the boundary for providing compensation for permitted wetland impacts. For example, if a bank's service area is the watershed in which it is located, the bank sponsor can only sell credits to permittees whose impacts occur within that same watershed. The service area is generally set forth in the banking instrument.[226] Of the 219 approved banks in the country, 96 percent of the banking instruments contain information on service areas. Regardless of how the service area is defined, virtually all banking instruments indicate that the bank may be debited outside of the service area on a case-by-case basis, usually to be determined by the Corps.

Service areas are generally defined in one of two ways: by watershed or by county. Watershed service areas can be defined in two ways—by watersheds delineated by a state agency or by hydrologic units defined by the USGS.[227] Depending on the state and region, service areas can range in size from the watershed where the bank is located to the entire state. For example, all banks in the Chicago Corps district are principally available only for use for impacts within the watershed where the bank is located.[228] Alternatively, the Wisconsin

[224] *Id.*

[225] Lockwood, Susan. "Assumption, New Jersey Style." *National Wetlands Newsletter* 16:4 (1994): 6. "On December 22, 1993, New Jersey became the second state to assume the Clean Water Act (CWA) §404 wetlands protection program." Also, Michigan was the first state to assume these responsibilities according to: Brown, Stephen. "Michigan: An Experiment in Section 404 Assumption." *National Wetlands Newsletter* 11:4 (1989): 5.

[226] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks.* 60 Fed. Reg. 228, 58605-58614. 1995.

[227] USGS has divided and sub-divided the United States into hydrologic units. These successively smaller hydrologic units are classified into four levels: regions, sub-regions, accounting units, and cataloging units. The hydrologic units are arranged within each other, from the smallest (cataloging units) to the largest (regions). The 8-digit hydrologic unit areas are standardized and most commonly used to set service areas for mitigation banks. However, the 6-digit map, which is one step coarser, and the 10-digit map, which is one step finer, may also be used. See Hydrologic Unit Maps <http://water.usgs.gov/GIS/huc.html> 15 July 2002.

[228] The agreement also states that credits may be debited outside of the bank's watershed on a case-by-case basis. Army Corps of Engineers, Chicago district. *Interagency Coordination Agreement on Wetland Mitigation Banking.* Chicago: 1997. 7-8.

Waterfowl Association Banking Instrument states that the bank service area is the entire state of Wisconsin.[229] Watersheds themselves can vary widely in area and can be defined in different ways and at different scales.

The 1995 banking guidance suggests that service areas should based on the "Hydrologic Unit map of the United States," developed by the USGS and one of two ecoregional maps developed by the federal agencies.[230] Only 11 percent of bank service areas, however, are clearly based on the USGS hydrologic units. Of the 195 banking instruments that include information on geographic service areas, 53 percent are based on watersheds, 22 percent on county boundaries, 11 percent on hydrologic units, and 14 percent on other criteria. Other banking instruments indicate that the service area is defined by a state designated service area or the entire state.

For example, in South Carolina the state is divided into service units based on the General Soil Map of South Carolina and the Hydrologic Unit Map of South Carolina.[231] Service areas in Arkansas are based on five planning regions and smaller subsets of those regions called wetland-planning areas.[232]

Some banks adopt a tiered system for designating their service areas, such as primary, secondary, and tertiary service areas. This system is generally accompanied by different credit ratios based on the distance of the impact from the bank. For example, according to standard operating procedures developed by the Corp's Savannah district, "mitigation should be at or near to the project site and within the same watershed as the area of adverse impacts. Mitigation which fails to meet this standard will result in a lower credit calculation due to the kind and location factors."[233]

Several states, such as New Hampshire and Connecticut, have delineated relatively small service areas. New Hampshire, which is only 8,986 square miles, has delineated 110 service areas. In contrast, the service area for the Mile High Wetland Bank in Colorado includes eight counties and approximately 10,000 square

### PHASED BANKING

The expense of establishing wetland mitigation banks, particularly large banks and those that require significant structural changes, can be quite high. The expense is compounded when the sponsor is required to secure financial assurances for bank establishment and oversight and is only authorized to sell a limited number of credits prior to meeting performance standards. One way to circumvent this problem is to establish the bank in phases, such as constructing separate portions of the bank according to a specified timeline. The principal advantages to the phased approach are: diminished immediate need for large amounts of financial assurances; smaller initial capital investment; and decreased need for the sale of advance credits to cover initial expenses. Of the 219 approved banks in the country, approximately 25 have used some form of the phased approach. These banks range in size from 61 acres to 23,922 acres.[235] Florida has 10 phased banks—the largest concentration of phased banks in the country. Other states with phased banks include California, Georgia, Illinois, Kansas, North Carolina, New Jersey, Ohio, Oregon, and Virginia.

In Florida, the Department of Environmental Protection has instituted a phased program whereby the bank sponsor must secure two different permits from the department or a local water management district: a conceptual permit and a construction permit. Once the conceptual permit is approved, the bank sponsor can more easily secure funding for construction. The bank sponsor cannot, however, begin debiting the bank until it has been established. Under this phased approach, the bank sponsor must then secure a construction/operation permit to begin construction. In 10 cases, bank sponsors have secured a conceptual permit and then more than one construction permit, opting to approach bank development in phases. The Lake Louisa and Green Swamp bank in Palatlakha River watershed first secured a conceptual permit and then secured two construction permits: Lake Louisa and Green Swamp Phase I and Lake Louisa and Green Swamp Phase II.[236]

[229] Wisconsin Waterfowl Associates Wetland Mitigation Group, LLC. *Wisconsin Waterfowl Associates Wetland Mitigation Bank Prospectus and Operating Agreement for the Walkerwin Wetland Bank Site.* Banking Instrument. Colombia County, WI. 1996. 11. (Wisconsin has passed new regulations requiring that wetland mitigation banks established after February 1, 2002 must have defined service areas and mitigation cannot be applied statewide. Wis. Admin. Code §350.03.)

[230] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks.* 60 Fed. Reg. 228, 58605-58614. 1995.

[231] Interagency Agreement. *Joint State/Federal Administrative Procedures for the Establishment and Operation of Wetland Mitigation Banks in South Carolina.* July 1996. 18.

[232] Arkansas Multi-Agency Wetland Planning Team. <http://www.mawpt.org/wetlands/classification/divisions.asp> 15 April 2002.

[233] Army Corps of Engineers, Savannah district. *Standards Operating Procedure Compensatory Mitigation Wetlands, Openwater, and Streams.* 1997. 4.

[234] Mile High Wetlands Group. *Mile High Wetland Bank Prospectus Document, Final.* Banking Instrument. Brighton County, CO. 1999.
U.S. Census Bureau State and County Quick Facts, Colorado <http://quickfacts.census.gov/qfd/maps/colorado_map.html > 1 May 2002.
U.S. Census Bureau State and County Quick Facts, New Hampshire. <http://quickfacts.census.gov/qfd/states/33000.html > 1 May 2002.

[235] The smallest bank employing the phased approach is the Weathers' Wetland Mitigation Bank in Oregon and the largest bank is the Farmton Mitigation Bank in Florida.

[236] Ecosystems Land Mitigation Corporation. *Management and Storage of Surface Waters Technical Staff Report (Phase I).* Permit. Palatlakha River Watershed, FL. 1995.
Ecosystems Land Mitigation Corporation. *Management and Storage of Surface Waters Technical Staff Report (Phase II).* Permit. Palatlakha River Watershed, FL.1997.

miles. [234] Small service areas, coupled with limited demand for mitigation credits due to a low volume of permitted impacts, may create low demand for wetland mitigation banks. Nonetheless, service areas should not be enlarged or relaxed to create demand for a proposed or established wetland mitigation bank.

The ability of a mitigation site to replace wetland functions is largely related to where that replacement wetland is located in the landscape (see section III. "Bank siting considerations"). As such, bank service areas should be limited to an area in which lost wetland functions can be mitigated. This will usually limit the service area to the watershed in which the bank is located. Although the need for some flexibility is understandable, banking instruments should not include overly flexible statements allowing debiting outside the service area. If banks are allowed to debit impacts outside the designated service area, higher mitigation ratios should be required.

## MITIGATION METHODS IN USE

The federal wetland regulatory agencies have articulated a preference for the mitigation methods to be used in wetland mitigation banking. Both the 1990 MOA and the 1995 banking guidance reinforce the preference for wetland restoration over enhancement and creation. They further state that preservation should be used only in "exceptional circumstances," and wetland creation is expressly discouraged (see section III "Mitigation methods").

Considerable debate remains about the appropriate role of preservation as a mitigation option. Some wetland experts assert that preservation provides the ecological benefit of permanently protecting important aquatic resources that may not be protected through the existing regulatory process; for example, isolated wetlands (prairie potholes and vernal pools) not regulated in certain states, drier wetlands that are not considered jurisdictional wetlands, and forested wetlands that can be logged without a permit.[237] In addition, the performance record of manmade constructed wetlands is unsatisfactory. Created or restored wetlands often do not meet permit requirements[238] and rarely replace the ecological functions of the lost wetlands.[239] Preservation of extant high quality wetlands—by reducing mitigation uncertainty inherent in creation and restoration projects—may provide a greater likelihood of protection of long-term wetland functions and values from development by placing aquatic resources under conservation easements or by transfer of title to governmental agencies or conservation organizations.[240]

Federal policy has remained consistent in its support for restoration over other forms of compensatory mitigation. However, the majority of states allow all compensatory mitigation methods in their banking programs (see section III. "The state regulatory context for wetland mitigation banking"). Four states—Illinois,[241] Iowa,[242] Michigan,[243] and Minnesota[244] —do not allow enhancement and eight states—Iowa,[245] Kentucky,[246] Maryland,[247] Minnesota,[248] New Jersey,[249] Oregon,[250] Wisconsin,[251] and Wyoming[252]—do not allow preservation. Although a state may allow all mitigation methods, restrictions may be placed on less preferred types. For example, Ohio requires that for enhancement to be allowable, wetlands restoration or creation must also constitute a component of the compensatory mitiga-

[237] Spingarn, A. "High Ratio Wetland Preservation as a Mitigation Tool." *Unpublished.* February 4, 2000.

[238] Brown, P. and C. Lant. "The Effect of Wetland Mitigation Banking on the Achievement of No-Net-Loss." *Environmental Management* 23:3 (1999): 333-345; Turner, E., A. Redmond, and J. Zedler. "Count It by Acre or Function-Mitigation Adds Up to Net Loss of Wetlands." *National Wetlands Newsletter* 6:23 (November-December 2001): 5-6, 14-16.

[239] According to the NRC study (2001), only 21 percent of the mitigation sites met various tests of ecological equivalency to the wetland functions lost. The replacement wetlands ranged from 0 to 67 percent functionality. The compliance rates for the same studies ranged from six to 100 percent. *As cited in* Turner, E., A. Redmond, and J. Zedler. "Count It by Acre or Function-Mitigation Adds Up to Net Loss of Wetlands." *National Wetlands Newsletter* 6:23 (November-December 2001): 5-6, 14-16.
U.S. Environmental Protection Agency. *An Approach To Improving Decision Making in Wetland Restoration and Creation*. EPA/600/R-92. Corvallis: Environmental Protection Agency, Environmental Research Laboratory, 1992.

[240] Gardner, R. "Federal Wetland Mitigation Banking Guidance: Missed Opportunities." *Environmental Law Reporter* 26: (February, 1996): 10075-10079. Spingarn, A. "High Ratio Wetland Preservation as a Mitigation Tool." *Unpublished.* February 4, 2000.

[241] 20 Ill. Comp. Stat. 830/3-6.

[242] Mitigation Banking Review Team. *Technical Guidance for Wetland Mitigation Banking in Iowa.*

[243] 12 Mich. Admin. Code r. 281.951.

[244] Minn. R. 8420.0720.

[245] Mitigation Banking Review Team. *Technical Guidance for Wetland Mitigation Banking in Iowa.*

[246] Ky. Rev. Stat. §150.255(2).

[247] Md. Regs. Code tit. 26, §23.04.03.

[248] Minn. R. 8420.0720.

[249] N.J. Stat. Ann. §13:9B-13.

[250] Or. Rev. Stat. §196.600.

[251] Wis. Stat. §281.37.

[252] Wyoming Department of Environmental Quality. *Wyoming Statewide Wetland Mitigation Bank: Guidelines for Interpretation and Implementation.* Apr. 1995.

tion, resulting in at least one acre of restored or created wetland for each acre of wetland impacted.[253] Similarly, for wetland preservation to be acceptable, restoration or creation in general must also be undertaken, resulting in at least one acre of restored or created wetland for each acre of wetland impacted.[254]

States can guide the mitigation method used not only by placing requirements or restrictions on the bank sponsors, but on the credit user as well. The Standard Operating Procedures developed by the Corps' Charleston district require that at least 50 percent of the required mitigation credits purchased or created by any given permittee should be from restoration, creation, and/or enhancement activities.[255] This policy prevents permittees from purchasing credits solely generated from preservation activities to compensate for wetland impacts.

Of the 219 approved banking instruments, information on compensatory mitigation methods was documented for 143 banks. Sixty-two percent of these banks (89 banks) conduct restoration activities; 65 percent (93 banks) conduct enhancement activities; 45 percent (64 banks) conduct creation activities; and 44 percent (62 banks) conduct preservation activities.[256] The majority of banks—78 percent—employ multiple mitigation methods (e.g., restoration, enhancement, and preservation) at the bank site. The dominant mitigation method at each bank could not be determined. As a result, although several banks, such as the Anderson Tract Mitigation Bank in Texas, are predominately preservation banks, because they also conduct restoration and enhancement activities, they are documented as multi-mitigation method banks.[257]

Of the 32 banks documented that solely use one mitigation method, 11 are wetland restoration banks, 11 are wetland creation banks, five are enhancement banks, and the remaining five are preservation banks. The largest bank in the country, Farmton Mitigation Bank in Florida (23,922 acres),[258] is predominately an enhancement bank while the second largest bank, Sandy Island in South Carolina (16,826 acres),[259] is solely a preservation bank.

Through legislation and rule-making, states have tailored replacement ratios and bank credit valuation to guide the use of compensatory mitigation methods. Higher replacement ratios have been instituted for non-preferred methods, such as preservation and creation, to compensate for the lack of wetland acreage gain and the increased risk of mitigation failure (see box "Replacement ratios and credit valuation"). In these cases, the valuation of credits has been tailored to reflect mitigation method preferences, generally resulting in preferential treatment in the following order: restoration, creation, enhancement, and preservation. Replacement ratios range from 1 to as high as 3.5 acres for enhanced wetland[260] and 1 to 27 acres for preserved wetland per acre of wetland impact.[261] In defining credits, some banks have been authorized to offer only one credit per 13 acres of enhanced wetland in the bank[262] and one credit for 15 acres of preserved wetland. [263]

Enhancement and restoration are the primary mitigation activities generating credits for wetland mitigation banks. This likely reflects the cost-effectiveness, ease, and likelihood of effectively restoring a wetland where one was formerly present. Of all the methods, however, preservation remains the least costly and least risky to the bank sponsor,[264] which may explain its continued, frequent practice despite explicit discouragement in federal guidelines and policies.

[253] Ohio Admin. Code §3745-1-54(E)(4)(c).

[254] The requirement for accompanied restoration and creation when preservation is a component of compensatory mitigation may be waived if "the director determines that restoration or creation need not be a component based on significant ecological reasons." Ohio Admin. Code §3745-1-54(E)(5).

[255] U.S. Army Corps of Engineers, Charleston district. *Standard Operating Procedure - Compensatory Mitigation.* 30 Sept. 1996.

[256] Enhancement activities were documented at 93 banks; restoration at 89 banks; creation at 64 banks, and preservation at 62 banks. Of the 143 banks with compensatory mitigation information, 111 banks conducted multiple mitigation methods; hence these numbers are not mutually exclusive.

[257] Although predominately a preservation bank, Anderson Tract Mitigation Bank also conducted enhancement activities. Texas Parks and Wildlife Department. *Memorandum of Agreement for the Anderson Tract Mitigation Project for Highway Impacts to Wetlands Requiring Department of the Army Permits.* MOA. Sabine River Watershed, TX. 1994.

[258] Miami Corporation. *Farmton Mitigation Bank: Individual Environmental Resources Permit Technical Staff Report.* Permit. Volusia County, FL. 2000.

[259] South Carolina Department of Transportation. *Sandy Island Mitigation Banking Agreement.* Banking Instrument. Horry County, SC. 1996.

[260] Marsh Resources Inc. *Executed Banking Instrument for the purposes of establishing the Meadowslands Mitigation Bank.* Banking Instrument. Bergen County, NJ. 1999.

[261] Willow Grove Lake Wetlands Mitigation Bank (New Jersey) *as cited in* Spingarn, A. "High Ratio Wetland Preservation as a Mitigation Tool." *Unpublished.* February 4, 2000.

[262] Miami Corporation. *Farmton Mitigation Bank: Individual Environmental Resources Permit Technical Staff Report.* Permit. Volusia County, FL. 2000.

[263] Cedar Run Wetlands, L.L.C. *Cedar Run Wetlands Bank, Banking Instrument.* Banking Instrument. Prince William County, VA. 2000; Orange County Board of County Commissioners. *Split Oak Mitigation Bank: Wetland Mitigation Bank Permit Staff Report.* Permit. Orange County, FL. 1996.

[264] Spingarn, A. "High Ratio Wetland Preservation as a Mitigation Tool." *Unpublished.* February 4, 2000.

## WETLAND TYPES AVAILABLE FOR CREDITING

### Uplands and buffer acreage

According to the 1995 banking guidance, upland areas included in a wetland mitigation bank may receive credits "only to the degree that such features increase the overall ecological functioning of the bank"[275] (see section III. "Defining and determining wetland currency"). The inclusion of upland acreage in a mitigation bank may serve to buffer and protect the mitigation wetland from adjacent adverse land practices and land uses. In addition, uplands and the connectivity they provide between aquatic systems are essential for many wetland-associated animal species—providing essential habitat, breeding, and dispersal areas.[276]

Although the preservation or restoration of upland and buffer areas may enhance wetland functions on the site, they should not be directly counted as mitigation credits. Rather, a functional assessment should "determine the manner and extent to which [upland] features augment the functions of restored, created, or enhanced wetlands and/or other aquatic re-

**REPLACEMENT RATIOS AND CREDIT VALUATION TIED TO COMPENSATORY MITIGATION METHODS**

The following are examples of states that have tied replacement ratios or credit definitions to the mitigation method employed through statute, regulations, or guidance. Since states often combine replacement ratios and how credits are defined, the two methods are not distinguished. Replacement ratios are usually expressed in acres to be mitigated per acres impacted. Valuation of credits is often expressed as number of acres per credit.

| State | Replacement Ratio or Credit Value |
|---|---|
| Indiana[265] | Enhancement/Preservation: replacement ratios greater than 1:1; credit value may be as low as 10-25 percent of credit value of created or restored wetlands |
| Maine[266] | Restoration/Enhancement/Creation: 1:1 to 2:1 (depending on type of wetland impacted)<br>Preservation: 8:1 |
| Maryland[267] | Preservation: 1/10th credit, equaling about 15:1 replacement ratio |
| Michigan[268] | Preservation: 10:1 |
| Missouri[269] | Preservation to receive only partial credit |
| New Jersey[270] | Restoration: 2:1<br>Creation: 2:1 or less if applicant demonstrates equal ecological value<br>Enhancement based on documented assessment of ecological value of impacted wetland |
| Ohio[271] | Restoration/Creation: 1:1<br>Enhancement: 2:1<br>Preservation: 2:1 |
| Oregon[272] | Restoration: 1:1<br>Creation: 1.5:1<br>Enhancement: 3:1 |
| Wisconsin[273] | Restoration: 1:1<br>Enhancement: no credit to 1:1 depending on comparison functional values<br>Creation: 2:1 |
| Wyoming[274] | Restoration/Creation: 1:1<br>Enhancement: awarded for percent increase in measurable values (limited to 50 percent increase) |

[265] Mitigation Banking Review Team. *Interagency Coordination Agreement on Wetland Mitigation Banking within the State of Indiana.*
[266] 310 Code Me. R. §5.
[267] Nontidal Wetlands and Waterways Division. *Maryland Nontidal Wetland Mitigation Guidance*. July 1998.
[268] Mich. Admin. Code r. 281.925.
[269] Missouri Department of Natural Resources. *State of Missouri Aquatic Resources Mitigation Guidelines*. May 1998.
[270] N.J. Admin. Code tit. 7, §7A-15.8(c-e).
[271] Ohio Admin. Code §3745-1-54(E).
[272] Or. Admin. R. 141-085-0135.
[273] Wis. Admin. Code §350.07.
[274] Wyoming Department of Environmental Quality. *Wyoming Statewide Wetland Mitigation Bank: Guidelines for Interpretation and Implementation*. Apr. 1995.
[275] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995.
[276] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act*. Washington, D.C.: National Academy Press, 2001. 51-53.

[277] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995.

sources."[277]

Ninety wetland banking instruments indicate that uplands are present on the mitigation site and specify whether the upland acreage is available for debiting. Although some of the remaining 129 banks also may have wetland-upland complexes represented on the site, associated upland acreage is not indicated in the authorizing instrument. Only 15 banks indicate that upland buffers on the project site are not factored into the total credits available. Of the banks that include uplands, 90 percent (81 banks) count the acreage in the valuation of bank credits. Nationwide, 16,817 acres of uplands are explicitly included in the calculation of available credits.[278] The mean size of recognized upland acreage is approximately 218 acres per bank; however, a wide range of upland acreage exists. For example, the minimum size of upland on a bank was one acre and the maximum was 6,453 acres.[279]

The states with a large number of banks with upland credits were those in Florida (16), Georgia (15), Illinois (12), and Virginia (7).[280] The state of Florida has the largest amount of upland acreage per bank permitted for crediting.[281]

As with determinations of overall bank credits, acreage-based ratios are commonly used for valuing the extent to which uplands enhance overall wetland functions on a bank site. The value of one credit ranges from one acre of upland up to as many as 20 upland acres (see box "Upland credit definition ratios"). The most common ratio to value upland acreage is three acres of upland for each credit (3:1), with the average being five and a half upland acres per credit (5.5:1). Wisconsin is the only state that has established a crediting valuation ratio requirement in its banking statute. This state values one credit per 10 acres of an adequate zone of established vegetated upland; restoration on adjacent uplands that "provide additional ecological functions to the site, beyond filtering run-off" may receive one credit for every four acres.[282]

Florida, Maine, Ohio, and Wisconsin have statutes or regulations, and Colorado, Iowa, and Virginia have banking guidelines, that allow for crediting of uplands. Almost all of the states have instituted policies that place requirements on the extent that uplands can be counted. Mimicking the interagency guidance, Colorado and Florida allow upland crediting to the extent that it improves the ecological value or functioning of the bank;[283] Iowa grants only "limited credit" for upland acreage;[284] and Virginia allows preservation of upland buffers for credit only if the sponsor can prove a demonstrable threat to the adjacent areas.[285]

**UPLAND CREDIT DEFINITION RATIOS**

Credit definition ratios for upland acreage, as specified by 37 banking instruments.

| Number of upland acres per credit | Number of banks using specified ratio |
|---|---|
| 1:1 | 2 |
| 1.1:1 - 2.0:1 | 3 |
| 2.1:1 - 3.0:1 | 12 |
| 4:1 | 5 |
| 5:1 | 4 |
| 6:1 | 1 |
| 6.1:1 - 7.0:1 | 2 |
| 7.1:1 - 8.0:1 | 2 |
| 10:1 | 1 |
| 14:1 | 1 |
| 15:1 | 3 |
| 20:1 | 1 |

### Wetland types represented in banks

Although banking instruments routinely indicate that the wetland classification system developed by Cowardin (1979) will be used to define wetland type, the wetland types specified in banking instruments do not necessarily adhere to this system. Descriptions of wetland types in banking instruments are generally not uniform and are often inadequate, as one study found

[278] Four out of the 81 banks with debitable uplands do not indicate the amount of acreage. Thus, the total acreage is actually greater than the calculated 16,817 acres.

[279] The largest mitigation bank, Farmton Mitigation Bank, has the largest upland acreage among all banks; the upland acreage (6,453 acres) consists of 27 percent of the total bank acreage (23,922 acres). *As cited in* Miami Corporation. *Farmton Mitigation Bank: Individual Environmental Resources Permit Technical Staff Report.* Permit. Volusia County, FL. 2000.

[280] The number of banks in each state that allow for debiting of uplands are: Arizona (2), Colorado (4), Florida (16), Georgia (15), Illinois (12), Iowa (2), Mississippi (1), Nebraska (1), New Jersey (5), Ohio (1), Oregon (1), South Carolina (4), Tennessee (3), Texas (4), Utah (1), Virginia (7), and Wisconsin (2).

[281] Of the sixteen banks with debitable upland acreage greater than 100 acres, ten are located in Florida. The remaining six have one bank in each of the following states: Georgia, Mississippi, Nebraska, South Carolina, Tennessee, and Texas.

[282] Wis. Admin. Code §350.07.

[283] *Guidance to Colorado Division of Wildlife Staff on the Establishment, Use and Operation of Mitigation Banks in Colorado* and Fla. Admin. Code Ann. r. 62-342.470.

[284] Mitigation Banking Review Team. *Technical Guidance for Wetland Mitigation Banking in Iowa.*

[285] Virginia Marine Resources Commission and Virginia Institute of Marine Science. *Guidelines for the Establishment, Use and Operation of Tidal Wetland Mitigation Banks in Virginia.* 1 Jan. 1998.

to be the case for compensatory wetland projects in San Francisco.[286] Although 139 banking instruments contain specific information on the wetland types represented in the banks, because a uniform system is not used this report describes bank types in more generalized or popular terms, as reflected below.[287]

The most common wetland type represented in banks is palustrine emergent wetlands, which includes herbaceous wetlands, wet prairies, wet meadows, and inland freshwater marshes (a common wetland type covering over 25 million acres in the U.S.).[288] The Colbert-Cameron Mitigation Bank in Florida,[289] for example, provides enhancement of inland marsh habitat and the Florida Mitigation Bank preserves and enhances freshwater and sawgrass marsh habitat.[290] At least six banks in Illinois create and restore wet prairies.[291] Only a handful of banks seem to provide mitigation for wet meadows,[292] including Rainey Mitigation Bank[293] and Bailey's Meadow Mitigation in Utah,[294] and Rochester's Cornerstone Group-International Commerce Mitigation Bank in New York.[295]

Studies have found that herbaceous wetland types have been effectively restored and created, essentially replicating natural reference systems.[296] Due to a better mitigation performance record, bank sponsors may prefer to provide compensatory mitigation of freshwater emergent marshes to other wetland types. However, some palustrine emergent wetland types, such as sedge meadows, may be more difficult to replace.[297]

Despite significant creation and restoration challenges, the second most common wetland types in banks are palustrine forested and palustrine scrub-shrub wetlands,[298] including bottomland hardwood wetlands,[299] pine flatwoods/savanna,[300] and southern deepwater swamps[301] (e.g., cypress swamps).[302] Significant repre-

[286] Breaux, A. and F. Serefiddin. "Validity of Performance Criteria and a Tentative Model for Regulatory Use in Compensatory Wetland Mitigation Permitting." *Environmental Management* 24:3 (1999): 327-336.

[287] One hundred thirty-nine (139) banks clearly specify wetland types to be restored, created, enhanced, or preserved on-site. The remaining 80 banks either do not have a wetland type(s) determined at the time the authorizing instrument was finalized or the specific wetland type(s) failed to be captured during data entry due to inadequate documentation.

[288] Dahl, T. *Wetlands Status and Trends of Wetlands in the Conterminous United States 1986 to 1997.* United States. Department of the Interior, Fish and Wildlife Service. Washington: Department of the Interior, Fish and Wildlife Service, 2000. 10.

[289] Stenstrom, IcIntosh, Colbert, Whigham and Simmons. *Colbert-Cameron Mitigation Bank, Permit # 4-127-0314A-ERP.* Permit. Volusia County, FL. 1996.

[290] D&J Ranch Inc. *Florida Department of Environmental Protection Permit 492924779.* Permit. Osceola County, FL. 1997.

[291] Ecologic Planning, Inc. *Big Sag Wetland Conservancy Authorizing Instrument.* Hainsville, IL. 2001; Land & Water Resources. *Department of the Army Permit # 199801092.* Permit. Lake County, IL. 1999; DeKalb County Forest Preserve District. *DeKalb Forest Preserve Wetland Mitigation Bank.* Permit. DeKalb County, IL. 1999; Land & Water Resources, Inc. *Department of the Army Permit # 199600027.* Permit. Kane County, IL. 1996; Land & Water Resources, Inc. *Department of the Army Authorization, Permit # 199700831.* Permit. DuPage County, IL. 1998; Land & Water Resources, Inc. *Kilbuck Creek Wetland Mitigation Bank Charter.* Permit. Winnebago County, IL. 1998.

[292] Wet meadow is grassland with waterlogged soil near the surface but without standing water for most of the year. This wetland type is categorized as palustrine emergent. *As cited in* Mitsch, W., and J. Gosselink. *Wetlands, 2nd Edition.* New York: Van Nostrand Reinhold, 1993. 32.

[293] Diversified Habitats, LLC. *Mitigation Bank Enabling Instrument: Rainey Mitigation Bank.* Banking Instrument. Davis County, UT. 1998.

[294] Diversified Habitats. *Mitigation Bank Enabling Instrument Bailey's Meadow Mitigation Bank.* Banking Instrument. Salt Lake County, UT. 1999.

[295] Rochester's Cornerstone Group-Rochester International Commerce Center LLC. *Rochester's Cornerstone Group-Rochester International Commerce Center, Limited Liability Company Mitigation Banking Agreement.* Banking Instrument. Monroe County, NY. 1998.

[296] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act.* Washington, D.C.: National Academy Press, 2001. 22.

[297] *Id.* at 27.

[298] C&C Builders Wetland Mitigation Bank in New Jersey is creating and enhancing scrub shrub and forested wetland types. *As cited in* C&C Builders LLC. *Resolution of the New Jersey Wetlands Mitigation Council Conditionaly Appoving the C&C Builders, LLC Phase I Freshwater Wetland Migiation Bank.* Misc. agreement. Essex County, NJ. 1998.

[299] Riparian wetlands occur along rivers and streams and are occasionally flooded but otherwise dry for varying portions of the growing season. Riparian ecosystems are referred to as bottomland hardwood forests in the southeastern U.S. *As cited in* Mitsch, W., and J. Gosselink. *Wetlands, 2nd Edition.* New York: Van Nostrand Reinhold, 1993. 40; Obion Wetland Mitigation Bank in Tennessee provides an example of bank restoration and enhancement and Coastal Bottomland Mitigation Bank in Texas provides an example of bank preservation of bottomland hardwood forests. *As cited in* Tennessee Department of Transportation. *Obion Wetland Bank Site Plan.* MOA. Dyer County, TN. 2000. *And* Texas Department of Trasportation. *Mitigation Banking Instrument for the Coastal Bottomlands Mitigation Bank.* Banking Instrument. Brazoria County, TX. 1999.

[300] Stennis Space Center Mitigation Bank in Mississippi provides an example of bank restoration of a pine savanna habitat. *As cited in* NASA. *Final Mitigation Plan for General Permit Wetland Compliance at the John C. Stennis Space Center, Mississippi.* Banking Instrument. Hancock County, MS. 1996.

[301] Southern deep water swamps are freshwater woody wetlands located in the southeastern U.S. that have standing water for most if not all of the growing season. *As cited in* Mitsch, W., and J. Gosselink. *Wetlands, 2nd Edition.* New York: Van Nostrand Reinhold, 1993. 39.

[302] Blue Elbow Swamp Mitigation Bank in Texas is preserving and enhancing cypress-tupelo bottomland hardwood forest. *As cited in* Texas Department of Transportation. *Memorandum of Agreement for the Blue Elbow Swamp Mitigation Project for Highway Impacts to Wetlands Requiring Department of the Army Permits.* MOA. Orange County, TX. 1995.

sentation of these wetland types is likely due to the fact that freshwater forested wetlands (including riparian forests and deepwater swamps) constitute the most extensive class of wetlands in the United States (50.7 million acres).[303] Enhancement and restoration activities take place almost twice as often as preservation and creation activities on these banked forested wetlands. Forested wetland sites, however, have been found to be difficult to restore or create due to the long time frame necessary to establish mature woody vegetation.[304] Despite such mitigation challenges, the focus on preserving, enhancing, and restoring forested wetlands, including riparian systems, may prove ecologically beneficial. According to the NRC study, special attention and protection should be afforded to riparian wetlands due to their contribution to stream water quality, stream health, and their unique position in the landscape.[305]

Coastal and marine wetland systems are less frequently found in banks. These include estuarine intertidal emergent wetlands, such as salt and brackish water marshes, which constitute about five percent of the total wetland acreage (5.3 million acres) in the U.S. These wetland types may, however, be represented but because they are not adequately classified, may not have been captured in this study. For example, banking instruments may fail to identify whether a "marsh" is a salt or freshwater marsh or whether a scrub wetland is estuarine or palustrine. Of the 139 banks with documented information on wetland types, less than 10 percent (14 banks) are restoring, creating, enhancing, or preserving saltwater marshes or tidal wetlands.[306] Even though this number may be underestimated due to inadequate documentation, it still reveals the seeming under-representation of tidal wetlands in banks.

As discussed earlier, NRC asserts that impacts to certain wetland types, such as vernal pools, fens, and bogs, should be avoided, as they are "difficult to impossible to create from scratch."[307] Although impacts to these wetland types may be occurring, they are not commonly represented in banks. However, one bank in North Carolina, Greater Sandy Run Mitigation Bank,[308] aims to restore pocosin wetlands, evergreen shrub bogs particularly abundant in that state.[309] In addition, Warm Springs Mitigation Bank is enhancing highly disturbed fens in Colorado.[310] For these unique wetland types, preservation of extant acreage may be more appropriate than the creation of vernal pools, fens, and bogs from uplands or even formerly existing wetlands. In California, Southwest Santa Rosa Vernal Pool Preservation Bank[311] is preserving 35.1 acres and Wright Preservation Bank[312] is preserving 75.7 acres of vernal pools.[313]

For all wetland categories, there is general concern that mitigation largely results in the establishment of more open water wetlands and wetlands significantly wetter than natural wetland systems.[314] According to the EPA, the most common type of wetland mitigation nationwide is a pond surrounded by an emergent marsh.[315] Open water habitats—including rivers,

[303] Dahl, T. *Wetlands Status and Trends of Wetlands in the Conterminous United States 1986 to 1997.* United States. Department of the Interior, Fish and Wildlife Service. Washington D.C.: Department of the Interior, Fish and Wildlife Service, 2000. 10.

[304] Niswander, S. and W. Mitsch. 1995. "Functional Analyses of a Two-Year-Old Created In-stream Wetland: Hydrology, Phosphorus Retention, and Vegetation Survival and Growth." *Wetlands* 15:3 (1995): 212-225.

[305] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act.* Washington, D.C.: National Academy Press, 2001. 5.

[306] The thirteen banks mitigating estuarine or coastal wetland types are: Bracut Marsh Mitigation Bank, CA; CGW Mitigation Bank, FL; Colbert-Cameron Mitigation Bank, FL; Everglades Mitigation Bank, FL; Farmton Mitigation Bank, FL; Huspa Creek Wetland Mitigation Bank, SC; Hobson Yard, NE; Inland Sea Shorebird Reserve Bank, UT; Little Pine Island Mitigation Bank, FL; Marsh Resources Inc Meadowlands Mitigation Bank, NJ; Marshlands Plantation Inc. Mitigation Bank, GA; McHugh Wetland Mitigation Bank, WA; Palacios Wetland Mitigation Bank, TX; and Tampa Bay Wetland Bank, FL.

[307] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act.* Washington, D.C.: National Academy Press, 2001. 24-27.

[308] United States Marine Corps. *Agreement to Establish the Greater Sandy Run Mitigation Bank in Camp Lejeune, Onslow County, North Carolina.* MOA. Onslow County, NC. 1999.

[309] Mitsch, W., and J. Gosselink. *Wetlands, 2nd Edition.* New York: Van Nostrand Reinhold, 1993. 55.

[310] Warm Springs Wetland, LLC. *Warm Springs Wetland Mitigation Bank Charter.* Banking Instrument. Park County County, 2000.

[311] Sonoma Vernal Pool, Inc. *Memorandum of Agreement for the South West Santa Rose Vernal Pool Preservation Bank (and Authorization to Create Wetlands).* MOA. Engle County, CA. 1999.

[312] California Department of Fish and Game and the Sonoma County Agricultural Preservation and Open Space District. *Memorandum of Agreement for the Wright Preservation Bank.* MOA. Sonoma County, CA. 1997.

[313] Only three banks are found to mitigate vernal pools, all of which are in California: Southwest Santa Rosa Vernal Pool Preservation Bank, Wildlands Mitigation Bank, and Wright Preservation Bank. Southwest Santa Rosa Vernal Pool Preservation Bank and Wright Preservation Bank are preserving vernal pools on site. The documentation for Wildlands Mitigation Bank was insufficient to determine the mitigation method used.

[314] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act.* Washington, D.C.: National Academy Press, 2001. 29.

[315] U.S. Environmental Protection Agency. *An Approach To Improving Decision Making in Wetland Restoration and Creation.* EPA/600/R-92. Corvallis: Environmental Protection Agency, Environmental Research Laboratory, 1992. *As cited in* Spingarn, A. "High Ratio Wetland Preservation as a Mitigation Tool." *Unpublished.* February 4, 2000.

streams, lakes, and ponds—are commonly present or created at bank sites and are routinely included in bank valuation and crediting. In response to this concern, the state of Wisconsin has declared that the creation of ponds or deepwater habitats as mitigation for wetlands may not be approved unless the wetland impacted is a deepwater marsh or shallow open water community.[316]

State or regional banking policy can prohibit certain types of compensation in an effort to discourage impacts to these wetland types. Alternatively, states or regions can tailor mitigation replacement ratios to create disincentives for impacting certain wetland types. The number of acres that is required for mitigation could also be increased for rare or threatened habitats; wetland types difficult to create or restore; or for mitigation that will result in high temporal losses, such as for riparian woody wetlands that require a longer time frame before establishing mature, functioning systems.[317]

In general, replacement ratios are higher for scrub-shrub or forested wetland types versus emergent or farmed wetlands. For example, Missouri has the following replacement ratios (expressed in terms of acres to be mitigated per acres impacted): 1:1 for open water; 1-1.5:1 for farmed wetlands; 1-3:1 for emergent wetlands; 1.5-3:1 for scrub shrub wetlands; 2-4:1 for wooded wetlands.[318] Michigan requires a 5:1 ratio for impacted rare or imperiled wetlands and 2:1 for forested wetland types, certain coastal wetlands, and for wetlands that border on inland lakes; and for all other wetlands the replacement ratio is 1.5:1.[319] Wisconsin allows for a lower replacement ratio, 1:1 instead of 1.5:1, for permitted projects that do not impact deep marshes, ridge and swale complexes, wet prairies (not dominated by reed canary grass), ephemeral ponds in a wooded setting, sedge meadows or fresh wet meadows (not dominated by reed canary grass), and certain bogs and hardwood/conifer/cedar swamps.[320]

Through the development of specific crediting requirements, such as the way credits are defined or can be withdrawn, states can encourage the inclusion of desired wetland types in their banking programs. For example, states can assign fewer credits per acre for more easily mitigated wetlands, such as freshwater emergent wetlands, and greater credits per acre for wetland types that are more difficult to restore or that take longer to achieve functionality, such as forested and riparian wetlands and wet prairies. Less frequently, authorizing agencies tie the timing of credit release to the type of wetland mitigated to influence the wetland types that will be represented in a banking program. In Louisiana, credit release is staggered over a longer time period and released in smaller increments for forested versus marsh mitigation banks. At year five, 50 percent of the total credits can be released for marsh banks but only 35 percent of total credits can be released for forested wetlands.[321]

### In-kind vs. out-of-kind

Since the goal of compensatory mitigation is to replace wetland functions that are lost through authorized development activities, in-kind wetland compensation is encouraged. Out-of-kind compensation, however, is allowed on a case-by-case basis if it is "determined to be practicable and environmentally preferable to in-kind compensation."[322] The 1995 banking guidance does stipulate that non-tidal wetlands should not be used to compensate for tidal wetland impacts.[323]

In-kind mitigation would dictate that if impacts to a forested wetland are approved, the lost functions should be replaced with a forested wetland that provides equal or higher functions. In many parts of the country, however, a compelling case may be made for out-of-kind compensation when it is used to restore historically abundant or rare wetland types. For example, if a state historically had an even distribution of white cedar swamps and emergent non-tidal wetlands, but historic losses of white cedar swamps have left the state with only 10 percent cedar swamps and 90 percent other non-tidal wetlands, the vast majority of current wetland impacts would occur to emergent non-tidal wetlands. These would typically be replaced in-kind through compensatory mitigation. However, if the state natural resource agency is concerned about the loss of migratory songbirds that are dependent on white cedar swamps for breeding, the establishment of the original distribution of non-tidal wetlands would be an appropriate management goal—50 percent white cedar swamp and 50 percent emergent non-tidal wetlands. As a result, the regulatory agency may appropriately decide to approve out-of-kind mitigation for impacts to emer-

[316] Wis. Admin. Code §350.05.

[317] Breaux, A. and F. Serefiddin. "Validity of Performance Criteria and a Tentative Model for Regulatory Use in Compensatory Wetland Mitigation Permitting." *Environmental Management* 24:3 (1999): 327-336.

[318] Missouri Department of Natural Resources. *State of Missouri Aquatic Resources Mitigation Guidelines*. May 1998.

[319] 12 Mich. Admin. Code r. 281.954.

[320] Wis. Admin. Code §350.06.

[321] La. Admin. Code. tit. 43:I, §724(F)(10)(c).

[322] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995. II.D.5.

[323] *Id.*

gent wetlands to compensate for historic losses of white cedar swamps.

In some cases, allowing out-of-kind mitigation to replace important wetland functions may be desirable, particularly if part of a watershed or landscape plan. Out-of-kind mitigation, however, should not be used to facilitate the loss of wetlands with high quality functions and values by making it easy to replace them with those of lower quality or ease of creation or restoration. In addition, rare, declining, or mature wetland types should not be replaced with more ubiquitous types. To help prevent the further loss of rare and threatened wetland habitats, states should establish a system that sets goals for replacing specific acreage of common wetland types with designated rare or declining wetlands.

This study did not systematically document whether or not banks require in-kind mitigation. However, upon cursory review, banks generally follow federal policy and require in-kind compensation of aquatic resources impacts. In-kind requirements are also reflected in state banking statutes, regulations, and guidelines (see section III. "The state regulatory context for wetland mitigation banking"). Bank instruments may specify that out-of-kind mitigation is allowed on case-by-case basis if determined to be environmentally preferable. For example, Weeks Bay Mitigation Bank in Alabama generally requires in-kind mitigation; however, impacts to low quality wetlands can be accepted as out-of-kind compensation if the permittee purchases wetland that are predicted to be of a higher quality when constructed.[324] Woodbury Creek Wetlands Mitigation Bank in New Jersey authorizes in-kind replacement of palustrine forested wetlands, palustrine scrub-shrub wetlands, and palustrine emergent wetlands. However, the bank may be used for out-of-kind replacement on a case-by-case basis.[325]

The way in which wetland types are delineated and reported will affect what constitutes in-kind versus out-of-kind mitigation. Disagreement among MBRT members and between the MBRT and bank sponsors has resulted over how wetland types are defined and how out-of-kind is determined.[326] The Mobile district, for example, considers all freshwater non-tidal wetlands one category, and essentially prohibits replacement of freshwater for saltwater wetlands or hardwood forested wetlands for open water wetlands.[327]

## DEBITING ACTIVITIES (BANK USE)

Many banks have defined parameters for debiting activities in their banking instruments. These parameters outline the debiting activities for which the credits are authorized to be used. Most banks allow credits to be used for wetland impacts resulting from linear projects and other permitted activities under §404 of the CWA. This may depend on many factors, including the bank client, the purpose and goals of the bank, and the legal provisions supporting the agreement.

Some banks have very few limitations on debiting activities[328] while others are very stringent. Some banks award permission to debit on a case-by-case basis and do not define debiting activities in the authorizing instrument. Parameters commonly outlined in banking instruments include impacts to certain ecosystems or habitats (e.g., moist pine savannahs, forested wetlands, open water wetlands, aquatic habitats, etc.). The Trinity River Mitigation Bank in Texas, for example, divides the total number of available credits into separate accounts. Each account is available for debiting for different categories of Corps-authorized impacts.[329]

Some single-user banks are particularly specific about the debiting activities allowed. For example, the Ablemarle Corporation Mitigation Bank instrument describes debiting activities as "construction, general maintenance, operation or expansion of Ablemarle Corporation's industrial plant facilities, brine field pipeline and access road network, or any other corporate activity requiring §404 permit."[330] Single-user depart-

[324] Wetland Restoration, L.L.C. *Mitigation Banking Instrument, Weeks Bay Mitigation Bank.* Banking Instrument. Baldwin County, AL. 1998.

[325] United States Wetland Services. *Resolution of the New Jersey Freshwater Wetlands Mitigation Council Conditionally Approving Phases I and II of Woodbury Creek Wetlands Mitigation Bank.* Misc. agreement. Glouchester County, NJ. 1995.

[326] Environmental Law Institute. *Stakeholder Forum on Federal Wetlands Mitigation.* Washington D.C.: Environmental Law Institute, December 2001; Department of Energy-Savannah River Operations Office. Telephone Interview. 17 Jan. 2002.

[327] U.S. Army Corps of Engineers, Mobile district. Telephone Interview. 9 Nov. 2000.

[328] The banking instrument for the Warm Springs Wetland Mitigation Bank states "Any impact of any size that occurs in any class of wetland or open water that occurs within the service area may be mitigated at Warm Springs Wetland, provided that the Corps on Engineers determines that off-site rather than on-site mitigation is preferable for a particular impact."; Carpenter, Alan T. and Dick Roth. *Warm Springs Wetland Mitigation Bank Charter, Park County, Colorado.* Bank Charter. Park County, CO. 2000. 9.

[329] Halff Associates, Inc. *Mitigation Banking Instrument Agreement Trinity River Mitigation Bank, Ltd. Tarrant County, Texas, Permit Application No.: 199800370.* Banking Instrument. Tarrant County, TX. 2001. 16.

[330] Richardson, Bill. *Albemarle Corporation Mitigation Bank Instrument.* Banking Instrument. Magnolia, AR. 1999. 2.

ment of transportation banking instruments usually state simply that credits are available for unavoidable impacts for highway construction and mitigation projects.

## THE PRICE OF MITIGATION

The price of wetland mitigation bank credits per acre is not well documented and is difficult to estimate with precision. Approximately 25 out of the 219 approved banking instruments include information about the cost of credits per acre. In addition to the banking instruments analyzed, the Corps has collected this data on an additional 10 banks.[331] The 35 banks for which the price of credits was available show great variation among costs, with figures ranging from $500 per acre for enhancement (Old Beaver Wetland Mitigation Bank, Idaho)[332] to $106,000 per acre for creation (Downer's Grove, Illinois).[333] Some have anticipated that mitigation costs may rise as high as $20,000 per acre for all forms of compensatory mitigation in response to increases in "land values, performance demands, and technology costs."[334]

Variations in costs are likely due to such factors as demand for credits, the local regulatory framework, [335] availability of alternative compensation methods, mitigation method used, location of the bank, wetland type being replaced, and the size of the tract. Different prices per acre are often specified according to the mitigation method used (i.e., restoration, creation, enhancement, or preservation). It is also important to note that single-user banks (such as Old Beaver) do not typically calculate the price per acre.

Determination of the price of credits is done in several different ways. Some banking instruments and MBRTs clearly identify pricing criteria, and price credits accordingly. For example, some banking instruments indicate that the price is determined by the cost of the land plus restoration, creation, or enhancement costs, divided among all the credits available. Credit prices for the Black River Mitigation Bank in South Carolina are described as follows: $2.8 million for the purchase of the land, $192,000 for design, and $1 million for construction. The sum of these costs divided by the total number of acres (1,709) leads to a mitigation cost of $2,336 per acre.[336]

Mitigation banks may have variable financial objectives. One Corps study categorized the financial objectives of mitigation banks or mitigation ventures as "for-profit," "break-even," or "mixed."[337] Many commercial bankers view mitigation banking as an avenue for profit, which will be reflected in the pricing of credits. Many commercial bankers must consider the price of alternative mitigation options available in the region to ensure that the bank remains competitive.[338] As noted in a Corps study, "a mitigation credit market emerges when one or more ventures sell credits to one or more permit applicants for a price established by bargaining among sellers and permit applicants."[339] In most states there is some form of competition, or multiple "ventures" for buying and selling credits. On the other hand, many state agencies and some non-profit groups are obligated *not* to use mitigation as a revenue generating mechanism, and will therefore price credits to break even with the costs associated with credit production.

The financial objective of the bank may be inferred based on the bank type. For instance, private commercial, combination public-private commercial, and public commercial banks (see section III. "Bank basics") are the only bank types likely to be created with a motive for profit. On the other hand, if the sponsor is a private

[331] Brumbaugh, Robert. CEWRC-IWR-P "Credit Prices for Mitigation Supply Ventures, 1995-1997" 1997.

[332] Figure estimated from land purchase price; engineering, planning, supervision, and administration costs; and development costs divided by total number of acres in bank. See "Draft Report – Wetland Mitigation Banking Case Study: Old Beaver Wetland Mitigation Bank Idaho Transportation Department, Idaho; August 1992." 13.

[333] Development and Environmental Concerns, DuPage County. Spreadsheet on "DuPage County Wetland Banks." Information updated January 4, 2001.

[334] Bank, Fred, and Paul Garrett. "Federal Aid Highway Program and Wetlands Mitigation." *Greener Roadsides*. United States. Department of Transportation, Federal Highway Administration. Washington D.C.: Federal Highway Administration Office of Natural Environment. Volume 8, No. 3, Summer, 2001. 3.

[335] Shabman, Leonard A., Paul Scodari, and Dennis King. "Wetland Mitigation Banking Markets." Mitigation Banking Theory and Practice. Eds. Lindell L. Marsh, Douglas R. Porter, and David A. Salvesen. Washington D.C.: Island Press, 1996. 114.

[336] *CTE Products and Services Page – Connections '98 Conference*. Center for Transportation and the Environment. 29 April 2002. <http://itre.ncsu.edu/cte/P-thunter.html>.

[337] Brumbaugh, Robert. CEWRC-IWR-P, 1997. "Credit Prices for Mitigation Supply Ventures 1995-1997." 1997.

[338] Strand, Peggy. Personal telephone communication. 8 Mar. 2002.

[339] Scodari, Paul, et al, *National Wetland Mitigation Banking Study Commercial Wetland Mitigation Credit Markets: Theory and Practice*. IWR Report 95-WMB-7 November 1995. vii.

**ASSESSMENT METHODOLOGIES USED FOR EVALUATING BANK CREDITS.**

- **Acreage**: a simple acreage index is often used as a surrogate for wetland functions. For example, one credit may be defined as equal to one acre of restored wetland; one credit equal to three acres of enhanced wetland; and one credit equal to 15 acres of preserved wetland.
- **Best Professional Judgment**: a case-by-case assessment made by a professional familiar with a background in wetland science.
- **Functional Equivalency**: an established assessment methodology designed to measure one or more wetland functions or services.
- **Combination**: an approach that combines best professional judgment with wetland acreage scaled to some value of functionality.

non-profit or a public entity the financial objective may be to break-even.[340] Single-user banks operate slightly differently because the same entity produces and purchases the credits, leaving no real incentive to turn a profit from the sale of credits.

## WETLAND VALUATION AND CREDITING

A wetland credit is the standard unit of currency used to quantify the net gain in aquatic functions, usually by acreage, which result from wetland restoration, creation, enhancement, or preservation. The same standard used to define the number of credits available at a wetland mitigation bank should be used to evaluate the lost functions at the site of the permitted impact.[341] Wetland acres and functions should be evaluated at both the bank site and the impacted wetlands. How credits are defined in large part determines those wetland features that will be replaced or lost. Credits may be measured by some standard of functional equivalency, acreage, best professional judgment, or a combination of several techniques.

> *"Credits and debits are the terms used to designate the units of trade (i.e., currency) in mitigation banking. Credits represent the accrual or attainment of aquatic functions at a bank; debits represent the loss of aquatic functions at an impact or project site."*
>
> Source: Federal Guidance for the Establishment, Use and Operation of Mitigation Banks. 60 Fed. Reg. 228, 58605-58614. 1995. II.D.7.

To achieve the goal of no net loss of wetlands, wetland mitigation banking must employ a system that ensures that the amount of mitigation by any given permittee is at a minimum equally sufficient to compensate for permitted wetland losses. Comparing one wetland to another for purposes of mitigating a single project is difficult. Yet, banking requires that credits be used as currency to compensate for a variety of transactions, often involving vastly different wetland types and systems.

Functional assessment methodologies are considered the preferable approach to evaluating wetland credits at a bank site to ensure that lost wetland acres *and* functions are adequately replaced (see section III. "Defining and determining wetland currency"). This position was presented in the 1995 banking guidance and supported by the findings in the 2001 NRC study.[342] The current reliance on acreage to measure wetland values and functions may in large part be due to the lack of one standard methodology applicable for quantifying the different wetland functions and types across the nation.[343] Indeed, despite the plan developed by the Corps in 1996 to develop the HGM approach for assessing wetland functions, this method has failed to gain widespread acceptance or application by the Corps or other regulatory agencies.[344] The functional assessment techniques available today may be overly complex and costly, requiring extensive technical expertise, without providing sufficiently accurate and applicable results to warrant general use in the compensatory mitigation process.[345]

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[340] It should be noted that some banks with not-for-profit financial objectives state in the banking instrument that any profits gained from selling credits will be used to further the goals of the bank (e.g., purchase more land for development of wetlands). For example, in the case of the Shady Valley Wetland Mitigation Bank, the sponsor, The Nature Conservancy, is a non-profit organization, and "[i]f surplus funding is derived from the banking process, it will be applied towards acquisition of additional mountain bog habitat and/or a stewardship endowment." See The Nature Conservancy. *Shady Valley Wetland Mitigation Bank Memorandum of Agreement.* Memorandum of Agreement. Johnson County, Tennessee, 1997. Appendix A, 1.

[341] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act*. Washington, D.C.: National Academy Press, 2001. 7.

[342] *Id.* at 136.

[343] U.S. Army Corps of Engineers. *Regulatory Guidance Letter, No. 01-1.* "Guidance for the Establishment and Maintenance of Compensatory Mitigation Projects Under the Corps Regulatory Program Pursuant to Section 404(a) of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899." Washington, D.C.: U.S. Army Corps of Engineers. October 31, 2001.

[344] U.S. Army Corps of Engineers. *National Action Plan to Develop the Hydrogeomorphic Approach for Assessing Wetland Functions.* 61 Fed. Reg. 160. August 16, 1996.

[345] Kusler, J. and W. Niering. "Wetland Assessment: Have We Lost Our Way?" *National Wetlands Newsletter* 20:2 (March-April 1998): 1, 9-14.

The 1995 banking guidance states that if "an appropriate functional assessment methodology is impractical to employ, acreage may be used as a surrogate for measuring function."[346] Acreage-based transactions may, however, only compensate for a fraction of the wetland functions destroyed at impact sites.[347] The weakness of this approach is not surprising, as acreage may not have a one to one connection to wetland functions. For example, 28 acres of salt marsh were constructed in San Diego Bay expressly to provide nesting habitat for the endangered light-footed clapper rail. The bird did not utilize the marsh areas for nesting, however, even though they nested nearby and the right vegetation was present. Scientists determined that the coarse dredge-spoil soils did not supply sufficient nitrogen for the plants to grow tall enough to be suitable for nesting. Although an adequate amount of acreage was created, the mitigation site provided no clapper rail nesting functions.[348]

### Functional equivalency

Among the options commonly used to evaluate the number of available credits at a bank, functional equivalency measures are considered by most scientists to be the most effective at guaranteeing that wetland functions and acres are replaced. Functional equivalency is best determined through the use of science-based rapid assessment procedures that measures all recognized functions of both the impacted and mitigation sites.[349] Functional assessment methodologies, such as the HGM approach or HEP, were recommended for use in the 1995 banking guidance to determine credits and debits.[350] In 1996, the Corps and NRCS formally adopted the HGM approach.[351] Before being implemented locally, HGM must develop the approach regionally.

Of the 14 states that have banking statutes, regulations, or guidelines that indicate how credits will be defined, almost 60 percent (eight states) indicate that functional assessment methods are to be used, at least in part. Arkansas,[352] California,[353] Florida,[354] Louisiana,[355] and New Jersey[356] have either a statute or regulation that requires a functional assessment to be used to define credits. Colorado,[357] Iowa,[358] and South Carolina[359] have guidelines that do so.

At least 40 wetland functional assessment methodologies are currently in use in the United States for a variety of purposes.[360] At least 12 rapid assessment procedures are currently used in conjunction with wetland

[346] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995. II.D.7.

[347] Environmental Law Institute. *Wetland Mitigation Banking*. Washington D.C.: Environmental Law Institute, 1993. 79. Kusler, J. and W. Niering. "Wetland Assessment: Have We Lost Our Way?" *National Wetlands Newsletter* 20:2 (March-April 1998): 11.

[348] Zedler, J.B. 1993. Canopy architecture of natural and planted cordgrass marshes: Selecting habitat evaluation criteria. *Ecological Applications* 3(1) 123–138.

[349] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act*. Washington, D.C.: National Academy Press, 2001. 136.

[350] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995. II.D.7.

[351] *National Action Plan to Develop the Hydrogeomorphic Approach for Assessing Wetland Functions*. 61 Fed. Reg. 160, 42593-42603. 1996.

[352] Arkansas's statute defines credits based upon functional assessment, and Arkansas's guidelines specifically name the use of the hydrogeomorphic wetland assessment method. Ark. Code Ann. §15-22-1003; Arkansas Soil and Water Conservation Commission. *Arkansas Wetlands Mitigation Bank Program*.

[353] Cal. Fish & Game Code §1790. In addition to the statute, California has banking guidelines that also authorize credits to be defined using acreage, habitat quality, contribution to a regional conservation strategy, or any other acceptable basis. Wheeler, D. and J. Strock. *Official Policy on Conservation Banks*. The Resources Agency and California Environmental Protection Agency. 7 Apr. 1995. <http://ceres.ca.gov/wetlands/policies/mitbank.html>.

[354] According to Florida's regulations, bank credits are to be based upon degree of improvement in ecological value. Fla. Admin. Code Ann. R. 62-342.470.

[355] According to Louisiana's regulations, bank credits are to be based upon habitat units. La. Admin. Code tit. 43a, §I.724.

[356] According to New Jersey's regulations, bank credits are to be based upon wetland values and functions. N.J. Admin. Code tit. 7, §7A-15.23.

[357] According to Colorado banking guidance, bank credits are to be determined by functional assessment methodology. *Guidance to Colorado Division of Wildlife Staff on the Establishment, Use and Operation of Mitigation Banks in Colorado.*

[358] According to Iowa banking guidance, bank credits are to be applied on functional basis, equal to that required for wetland compensation. Mitigation Banking Review Team, *Technical Guidance for Wetland Mitigation Banking in Iowa.*

[359] According to South Carolina's banking guidance, the bank sponsor will propose the assessment methodology to determine the credits available in the bank. USACE, Charleston district; USEPA – Region IV; USFWS – Charleston Ecological Services Office; South Carolina Department of Natural Resources; South Carolina Department of Health and Environmental Control; and USDA – NRCS. *Joint State/Federal Administrative Procedures for the Establishment and Operation of Wetland Mitigation Banks in South Carolina*. July 1996.

[360] Bartoldus, C. *A Comprehensive Review of Wetland Assessment Procedures: A Guide for Wetland Practitioners*. St. Michaels, MD: Environmental Concern Inc., 1999. 2. Also see: Environmental Law Institute. *Wetland Mitigation Banking*. Washington D.C.: Environmental Law Institute, 1993; and National Research Council *Compensating for Wetland Losses Under the Clean Water Act*. Washington, D.C.: National Academy Press, 2001.

mitigation banking programs nationwide.[361] Functional assessment methodologies, however, are only used to define credits at approximately 13 percent of all wetland mitigation banks (25 banks).[362] The most commonly used functional assessment procedure for establishing bank credits is the Wetlands Rapid Assessment Procedure (WRAP) and its modified version (Modified Wetlands Rapid Assessment Procedure or MWRAP), as applied in Florida.[363] HEP is the second most commonly used procedure to determine credits, however, it is only found in use at approximately four banks. Two banks in Texas indicate that WET was used. One bank, Patrick Lake Wetland Mitigation Bank in Wisconsin, uses a procedure based on WET but adapted to the North Central United States.[364] One bank has adopted the IVA, which estimates relative value of wetland functions within a planning region and uses indicators based on predictors from WET.[365] Despite its formal recognition, only one banking instrument indicates that HGM is used to establish credits.

Four regionally developed approaches have been adopted to meet local banking needs. The Coulter Marsh Agricultural Wetland Mitigation Bank in Iowa determines credits and debits based on the NRCS's Midwest Regional Depressional Functional Wetland Assessment Model.[366] Three banks in California have adopted locally developed methods. The Barry Jones Wetland Mitigation Bank in California uses a variation of a wetland functional assessment, borrowing concepts from the "Draft Guidebook to Functional Assessment in Riverine Waters and Wetlands of the Santa Margarita Watershed."[367] The authorizing instrument for Santa Ana River Wetland Mitigation Bank indicates that WET and HEP were "too resource intensive and too broad;" thus, the sponsors developed their own valuation methodology for the bank.[368] The Southwest Santa Rosa Vernal Pool Preservation Bank determines preservation credits by combining the "Biological Resources Criteria from the High Quality Vernal Pool Site Verification Data Sheet, Phase II of the Plan" and the "Interim Method for Determining the Number of Available Credits and Service Areas for Vernal Pool Endangered Species Act Preservation Banks in the California Central Valley."[369]

### Combination

In addition to the more formal wetland assessment procedures, about 23 percent of banks (46 banks) have established a combined approach, which relies upon best professional judgment to scale wetland acreage according to some value of functionality. Some of these banks primarily rely on wetland acreage to establish credits, but use other functional measures as checks or supplements. The majority of these banks have adopted formulas to score credit values based on acreage adjusted by factors or multipliers in relation to compensation methods, wetland types (e.g., forested vs. emergent), habitat conditions, location (e.g., within or outside impacted watershed), financial assurances, or credit schedules. For example, the Charleston and Savannah Corps districts have developed a credit definition approach that combines best professional judgment along with some measures of functionality.[370]

Flexibility in banking statutes, regulations, or guidance may facilitate the adoption of approaches that com-

[361] Authorizing instruments indicate that at least twelve functional assessment methodologies are being used to determine bank credits. These include, in order of frequency: MWRAP (by six banks); HEP (by four banks); WRAP; and WET (each by two banks). The remaining procedures were cited each by one bank: HGM; Indicator Value Assessment (IVA); Wetland Evaluation Methodology (WEM); and Wildlife Habitat Appraisal Procedure (WHAP). Four regional and/or tailored approaches were also adopted, including a Functional Assessment in Riverine Waters and Wetlands of the Santa Margarita Watershed, Natural Resources Conservation Service Midwest Regional Depressional Functional Wetland Assessment Model, and two assessments tailored specifically to the bank site (one being a vernal pool assessment).

[362] Of the 219 approved banks, 200 had sufficient documentation to determine how credits were being defined. Of these 200 banks, 25 were using established functional assessment methodologies.

[363] Six banks in Florida indicate that credits are established by MWRAP and two Florida banks indicated that WRAP is used.

[364] U.S. Army Corps of Engineers. *The Minnesota Wetland Evaluation Methodology for the North Central United States.* St. Paul, MN: U.S. Army Corps of Engineers, St. Paul district, 1988a.

[365] Bartoldus, C. *A Comprehensive Review of Wetland Assessment Procedures: A Guide for Wetland Practitioners.* St. Michaels, MD: Environmental Concern Inc., 1999. 51-51.

[366] Iowa Wetland Mitigation Bank, Inc. Banking *Instrument: Coulter Marsh Agricultural Wetland Mitigation Bank in the State of Iowa (Draft).* Banking Instrument. Franklin County, IA. 2000.

[367] Pacific Bay Homes. *Memorandum of Agreement Regarding the Establishment, Operation and Use of the Barry Jones Wetland Mitigation Bank.* MOA. CA. 1997.

[368] Riverside County Park. *Memorandum of Agreement Regarding the Establishment, Operation and Use of the Santa Ana River Mitigation Bank.* MOA. Riverside County, CA. 1997.

[369] Sonoma Vernal Pool, Inc. *Memorandum of Agreement for the South West Santa Rose Vernal Pool Preservation Bank (and Authorization to Create Wetlands).* MOA. Engle County, CA. 1999.

[370] U.S. Army Corps of Engineers, Charleston district. *Standard Operating Procedure Compensatory Mitigation.* RB-SOP-96-01. September 30, 1996; U.S. Army Corps Engineers, Savannah district. *Standard Operating Procedure Compensatory Mitigation: Wetlands, Openwater, & Streams.* June 7, 2000.

bine several valuation techniques. Three states—California, Illinois, and Oregon—have banking statutes, regulations, or guidelines that allow for multiple credit valuation systems. Illinois' regulations allow bank credits to be determined by multiplying the appropriate mitigation ratio by the unit of compensation, which is the replacement area, function, or monetary contribution.[371] According to Oregon banking regulations, bank credits are calculated based on the relative value of a habitat type and the number of acres affected by mitigation activities.[372] California banking guidelines authorize credits to be defined using acreage, habitat quality, contribution to a regional conservation strategy, or any other acceptable basis.[373]

Combined approaches provide a compromise between straight acreage-based systems and the more rigorous, yet more time-consuming, science-based functional assessment methodologies. They do appear, however, to introduce greater opportunity for subjectivity and potential bias concerning relative wetland values and their significance. In addition, procedures that generate scores scaled to wetland acreage assume that wetland functions are multiplicative, which may not always be the case.[374] By combining and regionalizing current methods, banks may be able to increase the ecological validity behind credit definition without the significant commitment of time and resources required to perform many functional assessment techniques.

### Best professional judgment

Best professional judgment is the definition of credits based upon the personal knowledge and expertise of individuals familiar with wetlands and their functions, such as MBRT members.[375] Only three banks indicate in their authorizing instrument that bank credits will be based solely upon some form of best professional judgment: American Equities Mitigation Land Bank at Reedy Creek in Florida,[376] Burke County Mitigation Bank in Georgia,[377] and Georgetown Mitigation Bank in Idaho.[378]

In the early days of wetland mitigation banking, a larger proportion of banks, particularly small banks, relied upon best professional judgment to value credits.[379] In some cases, this process may be shaped by ecological considerations similar to those that drive more formal techniques; however, this method is less replicable and produces fewer quantitative outputs. According to NRC, science-based, regionally standardized procedures are preferable to best professional judgment in comprehensively evaluating wetland functions for both impacted and mitigation sites.[380]

### Acreage

Traditionally, acreage has been used to determine both credits and debits. This method indexes the number of acres of wetlands restored, enhanced, created, or preserved to a measure of function. The majority of banks—61 percent or 125 banks—currently define credits by acreage. In four states, banking regulations or guidelines authorize credits to be defined solely by acreage: Indiana,[381] Michigan,[382]Missouri, [383] and Wiscon-

[371] Ill. Admin. Code tit. 17, §1090.50.

[372] Or. Admin. R. 141-085-0260.

[373] Wheeler, D. and J. Strock. *Official Policy on Conservation Banks*. The Resources Agency and California Environmental Protection Agency. 7 Apr. 1995. See < http://ceres.ca.gov/wetlands/policies/mitbank.html>.

[374] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act*. Washington, D.C.: National Academy Press, 2001. 131.

[375] Environmental Law Institute. *Wetland Mitigation Banking*. Washington D.C.: Environmental Law Institute, 1993. 88.

[376] According to the authorizing instrument for American Equities Mitigation Land Bank at Reedy Creek in Florida, bank credits are based upon the review of existing habitat value and proposed hydrologic and vegetative restoration efforts. *As cited in* American Equities #7 Ltd. *American Equities Mitigation Bank conceptual approval and permit for phase I and II construction.* Permit. Osceola County, FL. 1997.

[377] According to the authorizing instrument for Burke County Mitigation Bank in Georgia, bank credits are to be assessed using visual observation of field conditions and professional judgment. *As cited in* Georgia Department of Transporatation. *Individual Wetland Mitigation Banking Instrument for the Wetland Mitigation Bank in Burke County.* Banking Instrument. Burke County, GA. 1998.

[378] According to the authorizing instrument for Georgetown Mitigation Bank in Idaho, bank credits are determined by representatives from the U.S. Army Corps of Engineers, Idaho Department of Water Resources, Idaho Transportation Department, and the Idaho Fish and Game Department. *As cited in* Idaho Transportation Department. *Banking Instrument for: A Wetland Mitigation Bank at Georgetown Idaho.* Banking Instrument. Bear Lake County, 1996.

[379] Environmental Law Institute. *Wetland Mitigation Banking*. Washington D.C.: Environmental Law Institute, 1993. 88.

[380] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act*. Washington, D.C.: National Academy Press, 2001. 136.

[381] Mitigation Banking Review Team. *Interagency Coordination Agreement on Wetland Mitigation Banking within the State of Indiana.*

[382] Mich. Admin. Code r. 281.954.

[383] Missouri Department of Natural Resources, Missouri Department of Conservation, USFWS, USEPA, USACE, NRCS, and Missouri Department of Transportation; *State of Missouri Aquatic Resources Mitigation Guidelines*. May 1998.

**ACREAGE MEASURES IN WISCONSIN**

In Wisconsin, credit for restoration is set as one credit acre for every one acre restored. Credit for enhancement can range from no credit to one credit for every acre of wetland enhanced, depending on a comparison of functional values. Any creation accepted by the Wisconsin natural resources agency for project-specific compensation receives one-half credit acre for each acre of wetland created, unless the applicant can demonstrate that the circumstances warrant greater credit. Credit for establishment of an adequate zone of vegetated upland is 1:10. Restoration efforts on adjacent uplands that provide additional ecological functions to the site, beyond filtering run-off, may receive 1:4 credit.[385]

sin.[384] Acreage is a popular index since it can be determined without a site assessment and is not dependent upon any specialized technical knowledge.

Acreage measures generally define one credit as one acre of restored or created wetland. Often, fewer credits are assigned for enhancement and preservation and for upland acreage. For example, the banking instrument for the Flat Swamp Wetland Mitigation and Stream Restoration Bank in North Carolina defines credits based on an acreage formula.[386] More credit is typically assigned per acre to unique or ecologically significant wetlands or wetlands difficult to restore, such as bottomland hardwood forests. In addition, higher quality or certain categories of wetlands may be assigned higher credits per acre.

## MITIGATION REPLACEMENT RATIOS

Mitigation replacement ratios, also known as debiting or compensation ratios, are the "proportional requirements for replacing wetlands that are permitted for fill."[387] These ratios establish the number of units (commonly expressed as acres but also as credits) a permittee is required to replace given the number of units impacted. Establishing a consistent mitigation ratio facilitates the adequate and appropriate replacement of lost wetland acreage and functions.

Mitigation replacement ratios are often "tailored" to guide compensatory mitigation to particular geographic areas, to discourage impacts to particular wetland types or to large wetlands, and to discourage out-of-kind mitigation. For example, permittees whose impacts occur outside the service area of a bank where credits will be purchased or whose impacts are to rare wetland types, may be required to purchase more credits from the bank.

*A **mitigation replacement ratio** (compensation ratio) is the number of units of credits that must be debited from a bank to compensate or replace one unit of wetland expected to be lost. Ratios are generally expressed in functional units or acreage. The location, wetland type, and compensation method of the mitigation wetland can influence the ratio. For example, if a permittee impacts one acre of forested wetland, the may be required to replace it with two acres of forested wetlands, or a 2:1 ratio.*

### REPLACEMENT RATIOS IN BANKING INSTRUMENTS

The 1990 mitigation MOA established that in order to meet the goal of no net loss, the mitigation replacement ratio "should provide, at minimum, one-for-one functional replacement." This policy is commonly translated as a minimum of one acre mitigated for one acre impacted. Seven of the mitigation banking instruments analyzed require a minimum 1:1 mitigation replacement ratio.[388] To help buffer against banks failing to provide adequate functions, many banking instruments require mitigation replacement ratios that are higher than 1:1. Ten of the banks analyzed require minimum mitigation replacement ratios greater than one-to-one: one bank requires 1.5:1, four banks require 2:1, one bank requires either 3 or 3.5:1, one bank requires 10:1, and three banks rely upon multipliers (1.02, 1.04, 1.12) to be applied to a 1:1 compensation requirement.

Out of the 219 approved mitigation banking instruments, 112 provide information on replacement ratios. Forty-six percent of these 112 banking instru-

[384] Wis. Admin. Code §350.07.

[385] *Id.*

[386] Triangle Group. *Agreement to Establish the Flat Swamp Wetland Mitigation and Stream Restoration Bank in Craven County, North Carolina.* Banking Instrument. Craven County, NC. 2000.

[387] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act.* Washington, D.C.: National Academy Press, 2001. 108.

[388] Of the 219 approved banks, approximately half of the authorizing instruments (112 instruments) contained specifications on mitigation replacement ratios. Of the remaining 107 banks, 89 have instruments that fail to specify mitigation ratios and 18 could not be determined due to a lack of documentation.

ments adopt this tailored method.[389] Twenty-two banks have ratios tailored to wetland type or to reflect the wetland's restoration potential or uniqueness. Such a tailored approach might, for example, require three acres of replacement wetland for every acre of impacted woody riparian wetland (3:1 ratio), 2:1 for emergent wetland, 1.5:1 for scrub shrub wetland, and 1:1 for open water. The Santa Ana River Wetland Mitigation Bank in California has mitigation ratios based on the enhancement potential of the replacement wetland divided by a designated "value class" of the wetland lost.[390]

Sixteen banks require higher replacement ratios in cases when the impacted wetland is of a "high quality."[391] The Anderson Tract Mitigation Bank in Texas, for example, requires a 7:1 replacement for high quality wetlands, 5:1 for medium quality wetlands, and 3:1 for low quality wetlands.[392] Twelve banks set higher ratios for impacts that occur outside of the bank's geographic service area, watershed, or ecoregion.[393] Two banks establish higher ratios for impacts that occur within a coastal area. Ratios that reflect the size of the impact or the temporal nature of the impact are adopted by four banks. Three banks in Texas—Byrd Tract,[394] Klamm,[395] and Hawkins[396] mitigation banks—apply lower ratios for projects with "temporary" impacts as opposed to more permanent adverse effects, and Neabsco Wetland Bank in Virginia applies lower ratios for small-sized impacts (less than three acres).[397]

Replacement ratios may also be tailored based on the compensation method used. Three of the banks analyzed, Big Island in Ohio,[398] Coastal Bottomlands Mitigation Bank in Texas,[399] and Neabsco Wetland Bank in Virginia,[400] typically require higher ratios for mitigation wetlands that are enhanced or preserved as opposed to restored or created.

Forty percent of the banking instruments with replacement ratio criteria indicate that functional assessments (i.e., WET, HEP, and regional assessments) will be used to determine debits and resulting ratios, similar to credit determination.[401] In contrast, three banking instruments indicate that replacement ratios are to be determined on a case-by-case basis or by best professional judgment. These approaches may or may not result in ratios above the 1:1 minimum. For example, the authorizing instrument for the Patrick Lake Wetland Mitigation Bank in Wisconsin indicates that a regional functional assessment is to be used to determine the functional value of the wetlands lost.[402] The documentation for this bank, however, indicates that projects debiting the bank have been mitigated at a 1:1 ratio.

### Replacement and credit ratios by state law or policy

Ten states—Illinois, Maine, Maryland, Michigan, New Jersey, Ohio, Oregon, Texas, Wisconsin, and Wyo-

[389] Fifty-two banks have mitigation replacement ratios that are tailored based on factors, such as wetland type and compensation method. These ratios are often tailored by more than one criterion (such as higher ratios based on both wetland type and location of impacts). Thus, the numbers assigned to the different criteria are not mutually exclusive.

[390] Riverside County Park. *Memorandum of Agreement Regarding the Establishment, Operation and Use of the Santa Ana River Mitigation Bank.* MOA. Riverside County, CA. 1997.

[391] Wetlands may be assigned different categories, according to state statutes or policies. In Ohio, for example, wetland categories reflect the ability of wetlands to support functions (particularly wildlife habitat and species diversity) and values (recreation), and the quality of forested wetland types. Ohio Admin. Code §3745-1-54.

[392] Texas Parks and Wildlife Department. *Memorandum of Agreement for the Anderson Tract Mitigation Project for Highway Impacts to Wetlands Requiring Department of the Army Permits.* MOA. Sabine River Watershed, TX. 1994.

[393] Nine banks indicated higher ratios for impacts outside of the bank's service area, one of which had even higher ratios for project impacts outside both the service area and the ecoregion. Three banks had higher ratios for impacts outside of the watershed, one that specified even higher ratios if also outside the ecoregion.

[394] Enron Oil and Gas Company. *Mitigation Banking Agreement Byrd Tract Mitigation Bank Smith County, Texas.* Banking Instrument. Smith County, TX. 1998.

[395] KLAMM Inc. *Mitigation Banking Agreement Klamm Mitigation Bank Smith County, Texas.* Banking Instrument. Smith County, TX. 1998.

[396] R. Lacy, Inc. *Mitigation Bank Agreement Hawkins Mitigation Bank Smith County, Texas.* Banking Instrument. Smith County, TX. 1998.

[397] Wetlands Studies and Solutions, Inc. *Memorandum of Agreement Between Neabsco Wetland Bank Joint Venture and USACE to Establish a Procedure for Off-Site Compensation of Small Wetland Habitat Losses Under NWPs in Eastern Prince William County, Virginia.* MOA. Prince William County, VA. 1994.

[398] Ohio Wetlands Foundation. *Regulatory Functions Branch Letter, Big Island Mitigation Bank.* Misc. Agreement. Marion County, OH. 1994.

[399] Texas Department of Trasportation. *Mitigation Banking Instrument for the Coastal Bottomlands Mitigation Bank.* Banking Instrument. Brazoria County, TX. 1999.

[400] Wetlands Studies and Solutions, Inc. *Memorandum of Agreement Between Neabsco Wetland Bank Joint Venture and USACE to Establish a Procedure for Off-Site Compensation of Small Wetland Habitat Losses Under NWPs in Eastern Prince William County, Virginia.* MOA. Prince William County, VA. 1994.

[401] Forty-five banking instruments (out of 112 with replacement information) indicate that functional assessments would be used to determine debits and replacement ratios.

[402] Wisconsin Department of Transportation. *Letter of Agreement.* (Patrick Lake Wetland Mitigation Bank). Misc. Agreement. Dane County, WI. 1989.

ming—have a statute and/or regulation that specify replacement or crediting ratios (see Appendix I). Three states - Indiana, Minnesota, and Missouri - have guidelines that do so. Four states, Arkansas, Florida, Illinois, and Oregon, have a statute and/or regulation that require a higher credit ratio if the impact is not within the service area of the bank. Four additional states, Georgia, Indiana, Missouri, and South Carolina, have guidelines that mimic this requirement. Iowa[403] and Minnesota[404] have guidelines that require higher replacement or credit ratios if mitigation is not in-kind.

The guidelines in Georgia authorize a lower credit ratio if credits are withdrawn from a bank in a high growth county versus one in a rural county.[405] The regulations in Illinois authorize a higher replacement ratio if the impact site has endangered or threatened species, is essential habitat of endangered or threatened species, is an Illinois Natural Area Inventory Site, or is determined to have a high quality native wetland plant community.[406]

The large majority of replacement ratios fall between 1:1 and 3:1. Whether or not this represents a net gain in functions is unclear. The test is whether the required mitigation replacement ratios are actually fully met on the ground. Nine studies of four nonfederal mitigation programs found that mitigation replacement ratio requirements were never fully met, despite the fact that the mitigation replacement ratios for three of the nine programs were higher than 1:1.[407] In addition, studies have determined that the well-established five-year monitoring time frame is insufficient to evaluate whether a mitigation site will eventually achieve parity with a reference system; thus, mitigation ratios will often need to be higher than the wetland area lost in order to achieve functional equivalency.[408] Taking into account all of these factors, wetland scientists and regulators have generally argued that replacement ratios are routinely set too low for compensatory mitigation projects.[409]

[403] Mitigation Banking Review Team. *Technical Guidance for Wetland Mitigation Banking in Iowa.*

[404] Minnesota Board of Water & Soil Resources. *Guidelines for Wetland Banking Minnesota Wetland Conservation Act.* 16 Mar. 1994.

[405] USACE – Savannah district, USEPA – Region IV, USFWS – Southeast Region; and Georgia Department of Natural Resources. *Guidelines on the Establishment & Operation of Wetland Mitigation Banks in Georgia.* 1995. See <www.sas.usace.arym.mil/bankguid.htm#policy>.

[406] Ill. Admin. Code tit. 17, §1090.50.

[407] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act*. Washington, D.C.: National Academy Press, 2001. 109.

[408] *Id.* at 44.

[409] *Id*. at 108.

## CREDIT RELEASE

The 1995 banking guidance defines banking as "wetland restoration, creation, enhancement, and, in exceptional circumstances, preservation…*in advance of development actions*..."[410] Early credit release, however, is a defining component of wetland mitigation banking. As many as 92 percent of the nation's banks allow credits to be withdrawn from a mitigation bank in advance of bank maturity.[411]

The 1995 banking guidance allows for the advance sale of credits under certain circumstances (see section III. "Defining and determining wetland currency").[412] The guidance does not set a limit on the percentage of credits that can be sold prior to meeting performance standards. It states that decisions about advance debiting of credits should be made on a case-by-case basis.[413] Although a high percentage of banks allow release of credits prior to achieving all performance standards, most banks retain at least half of the potential credits for release after some performance standards have been met.

Advanced sale of credits is important to wetland mitigation banking because it allows bank sponsors—particularly private commercial bankers—to generate the capital necessary to establish and operate a bank. If banks are required to complete construction and meet final performance standards prior to debiting, bankers would have to invest in years of planning and large amounts of capital before having any possible chance of remuneration. Without this option, fewer private commercial banks may be established. The construction, monitoring, and maintenance needed to achieve performance standards can take many years.

Advanced debiting is common practice in every state and in all Corps districts, with the exception of the Galveston district, where credit sale is not permitted until "success criteria" are met.[414] Only 17 banks, or

[410] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995. Emphasis added.

[411] Only eight percent of the banking instruments specifically indicate that credits may not be sold prior to achieving final performance standards. Seventy-four percent specifically indicate that pre-sale of credits is allowed, 14 percent do not indicate whether or not credits may be released prior to achieving performance standards, and no documentation was available for the remaining four percent of the banks.

[412] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995.

[413] *Id*.

[414] Galveston district, U.S. Army Corps of Engineers. *Interagency Guidelines for the Development and Use of Mitigation Banks in the Galveston District, Corps of Engineers*. 21 July 1993.

eight percent of all of the banks in the United States, do not allow credits to be debited until final performance standards for the bank have been met.[415]

Of the 157 banking instruments that both allow credit release prior to meeting final performance standards and indicate credit release schedules, approximately 90 percent allow credits to be sold prior to achieving any performance standards. On average, banks allow for the advance debiting of 66 percent of credits prior to meeting all performance standards and 42 percent of credits prior to achieving interim performance standards or a portion of their standards. An interim standard could be achieving ten percent of vegetative coverage after one year of bank operation. Meeting a portion of the performance standards could mean that the bank has achieved two out of the ten performance standards, e.g., establishing wetland hydrology or removal of invasive species.

The percentage of credits released before achieving all performance standards ranges from 15 percent (3 banks)[416] to 100 percent. Furthermore, ten banks allow for the sale of 100 percent of credits prior to meeting any performance standards, i.e., the bank is allowed to sell all credits without providing any evidence that it has or will eventually lead to the establishment of a functional wetland. These banks are located in, California (5), Colorado (1), Louisiana (2), South Carolina (1), and Texas (1).[417] (See figure 5.)

In general, banks that allow for advance debiting do so only after the three principal milestones, outlined in the 1995 banking guidance, are met: 1) the banking instrument and mitigation plans have been approved; 2) appropriate financial assurances have been secured; and 3) the bank site has been secured through the use of restrictive covenants to ensure the future protection of the land. After meeting these criteria, most banks establish other milestones that allow for the release of additional credits. Credit release milestones are usually defined by construction schedules or the achievement of interim performance standards.

[415] California Department of Transportation. Banking Instrument: Pilgrim Creek Mitigation Bank. Banking Instrument. San Diego County, CA. 2000; Sonoma Vernal Pool, Inc. Memorandum of Agreement for the South West Santa Rose Vernal Pool Preservation Bank (and Authorization to Create Wetlands). MOA. Engle County, CA. 1999; Town of Limon. Limon Pilot Banking Instrument. Banking Instrument. Town of Limon, CO. 1996; Warm Springs Wetland, LLC. Warm Springs Wetland Mitigation Bank Charter. Banking Instrument. Park County County, 2000; GJ - Georgia Properties, Inc. Mitigation Banking and Revised Final Mitigation Plan for the Ogeechee River Mitigation Bank Bryan County, Georgia. Banking Instrument. Bryan County, GA. 1999; Idaho Department of Transportation. Memorandum of Agreement for Development and Use of a Old Beaver Wetland Bank in Idaho. MOA. 1988; Shorewood Corporation. Letter to Operations and Readiness Division Regulatory Branch (North) on Geist Reservoir Mitigation Bank. Hamilton, IN. 1990; Shorewood Corporation. Letter to Operations and Readiness Division Regulatory Branch (North) on Morse Reservoir Mitigation Bank. Hamilton, IN. 1990; Schroeder, Gary W. Bank Charter Schroeder Wetland Mitigation Bank. Banking Instrument. Tippecanoe County, IN. 1999; Triangle Group. Agreement to Establish the Scuppernong River Corridor Wetland Mitigation Bank in Tyrrell County, North Carolina. Banking Instrument. Tyrrell County, NC. 1998; The Nature Conservancy. Resolution of Wetlands Mitigaiton Council Approving Willow Grove Lake Wetlands Migiation Bank. Misc. agreement. Cumberland County, NJ. 1994; Harris County Flood Control District. Memorandum of Agreement for the Greens Bayou Wetland Mitigation Bank in Harris County. MOA. Harris County, TX. 1995; Van Riet, Lieven J. Katy-Cypress Wetland Mitigation Bank SWC Katy-Hockley Cutoff and Jack Road Harris County, TX: Final Approval and Signature Documents. MOA. Harris County, TX. 1996; Oak Meadows, Inc. Palacios Wetland Mitigation Bank Mitigation Banking Instrument. Banking Instrument. Calhoun County, TX 2000; Wetland Partners. Mitigation Banking Instrument Agreement Trinity River Mitigation Bank, Ltd. Banking Instrument. Tarrant County, TX. 2001; Old Dominon Electric Cooperative. Memorandum of Agreement Between Old Dominion Electric Cooperative and Virginia Electric and Power Company and U.S Army Corps of Engineers Norfolk District to Establish a Wetland Bank for Wetland Losses in the Roanoke River Basin. MOA. Halifax County, VA. 1997; White Cedar LLC. Memorandum of Agreement Between White Cedar and USACE to Establish a Procedure for Off-Site Compensation for Wetland Habitat Losses in Chesapeake, Suffolk, and Virginia Beach, Virginia. MOA. VA. 1995.

[416] POC - Willamsburg Environmental. *Banking Instrument: Shenandoah Wetland Company.* Banking Instrument. VA. 2001. 14; James River Wetland Mitigation Landbank LLC. *Banking Instrument James River Mitigation Landbank, L.L.C. Goochland County, Virginia.* Banking Instrument. Goochland County, VA. 1998. 14; Gray Cole, LLC. *Chickahominy Environmental Bank Mitigation Banking Instrument.* Banking Instrument. Charles City County, VA. 2000. 14.

[417] Mount Burdell Enterprises/Burdell Ranch Partners. *Memorandum of Agreement for the Burdell Ranch Wetland Conservation Bank Implementation Agreement.* MOA. Marin County, CA. 2000; Kimball Island Mitigation Bank. *Mitigation Banking Instrument: Kimball Island Mitigation Bank.* Banking Instrument. Sacramento County, CA. 1998; Conservation Resources, LLC. *Mitigation Bank Enabling Instrument, Laguna Creek Mitigation Bank.* Banking Instrument. Sacramento County, CA. 1999; Elliott Homes, Inc. *Clay Station Mitigation Bank Enabling Instrument.* Bank Instrument. Sacramento County, CA. 1999; Stillwater Plains Mitigation Bank, Inc. *Stillwater Plains Mitigation Bank.* Banking Instrument. Shasta County, CA. 2000; Land and Water Resources, Inc. *Upper Platte River Wetland Mitigation Bank Charter.* Bank Charter. Weld County, CO. 1998; TXI Operations, L.P. *Interagency Agreement Honey Island Swamp Mitigation Bank.* Interagency Agreement. St. Tammany Parish, LA. 2000; Poirrier and Poirrier Development, Inc. *Interagency Agreement Red River In-Lieu-Fee Mitigation Area.* Interagency Agreement. Slocum, LA. 2001; Newkirk Environmental Consultants, Inc. *Vandross Bay Mitigation Bank Plan.* Banking Instrument. Georgetown County, SC. 1994; Texas Dept. of Transportation. *Mitigation Banking Instrument for the Coastal Bottomlands Mitigation Bank.* Banking Instrument. Brazoria County, TX. 1999.

**CREDIT RELEASE MILESTONES FOR BARRA FARMS CAPE FEAR REGIONAL MITIGATION BANK, NORTH CAROLINA**

The Barra Farms Cape Fear Regional Mitigation Bank in North Carolina allows for the release of 15 percent of bank credits upon signing of the mitigation banking instrument; 15 percent upon completion of all restoration activities; 10 percent upon fulfillment of year one performance standards; 15 percent upon fulfillment of year two performance standards; 15 percent upon fulfillment of year three performance standards; 10 percent upon fulfillment of year four performance standards; and 20 percent upon fulfillment of year five performance standards.[418]

In some cases, bank sponsors need only meet minimal requirements before a substantial number of credits can be sold. For example, three of the six banks in Tennessee are able to sell 50 percent of the total expected amount of credits once the mitigation banking instrument is signed.[419] The majority of the banks that release 100 percent of their credits prior to achieving final performance standards or interim performance standards base credit release on construction milestones rather than ecological milestones. A number of banks also tie credit release to the approval of a management plan indicating how bank construction should proceed. For example, the charter for the Upper Platte River Wetland Mitigation Bank in Colorado states, "upon approval of [the] charter, no more than 30 percent of the total potential credits will be available for debit; upon written acceptance by the Corps that the site has been graded and planted according to the approved plans, 100 percent of the total available credits will be available for debit."[420] Overall, there are 31 banking instruments that either indicate the approval of management plans, design criteria, or as-built plans as a condition for release of credits.

The amount of credits that can be released prior to achieving performance standards is occasionally established through state statutes. For example, Oregon and Illinois allow 30 percent of bank credits to be sold before the bank demonstrates functional equivalency.[421] Maryland allows developers to use or sell up to half of the credits within the first two growing seasons. The remaining half of the credits may be released upon approval by the state regulatory agency once two full growing seasons have elapsed, provided that remediation is not required and the interim performance standards have been met.[422] Michigan, on the other hand, allows 75 percent of the credits to be sold before the wetland is fully functional as long as construction is completed and the plant community has achieved half of its design cover.

A few states do not specify the percentage of credits that will be available for presale, but do indicate whether or not presale is allowed on a case-by-case basis. In Washington, the Department of Ecology must determine for each approved bank whether to allow pre-construction release of credits, taking into consideration the particular ecological and economic circumstances of each bank.[423]

The 1995 banking guidance states, "The number of credits for withdrawal (i.e., debiting) should generally be commensurate with the level of aquatic functions attained at a bank at the time of debiting."[424] The majority of the banking instruments do tie the release of credits to the attainment of aquatic functions. Virtually all banks retain a fair number of the credits until the bank has met some performance standards. As noted earlier, there are only 10 banks that do not base the release of credits upon the achievement of some level of performance. The degree of aquatic functions exhibited at the bank at the time of debiting largely depends on how effective the performance standards are at measuring wetland functions.

## FINANCIAL ASSURANCES FOR BANK ESTABLISHMENT, OVERSIGHT, AND LONG-TERM MANAGEMENT

Given the possibility of mitigation bank failure or default and the risks in assigning liability, financial guarantees play an important function in the establishment, operation, and long-term management of mitigation banks (see section III."Financial assurances"). In the early 1990's only a handful of active or proposed banks included provisions for financial assurance. Today, the majority of banks have some form of financial assurance. Ideally, banking instruments should contain three

[418] EcoScience Corporation. *Agreement to Establish the Barra Farms Cape Fear Regional Mitigation Bank in Cumberland County, North Carolina.* Banking Instrument. Cumberland County, 1999. 9-11.
[419] U.S. Wetland Services, L.L.C. *Wolf River Wetland Mitigation Bank Memorandum of Agreement.* MOA. Fayette County, 1997. 8; Tennessee Department of Transportation. *Obion Wetland Bank Site Plan.* MOA. Dyer County, TN. 2000. 12; National Ecological Foundation. *Coffee County Wetland Mitigation Bank Memorandum of Agreement.* MOA. Coffee County, TN. 1995. 3.
[420] Land and Water Resources, Inc. *Upper Platte River Wetland Mitigation Bank Charter.* Bank Charter. Weld County, CO. 1998. 4.
[421] Or. Admin. R. 141-085-0430; Ill. Admin. Code tit. 17, §1090.70(d).
[422] Md. Regs. Code tit. 26, §23.04.06(D).
[423] Wash. Admin. Code §173-700-352.
[424] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks.* 60 Fed. Reg. 228, 58605-58614. 1995. II. D. 6.

distinct financial assurances: an assurance for bank establishment, an assurance for oversight, and an assurance for long-term management. Financial assurances for bank establishment generally cover construction and land acquisition costs. Oversight financial assurances cover the operational phase of the bank and generally include finances for bank monitoring, maintenance, and contingency plans. Finally, financial assurances for long-term management include the finances necessary to continue bank monitoring and maintenance in perpetuity.

The 1995 banking guidance states that banks should have financial assurances that reflect the realistic costs of monitoring, long-term maintenance, contingency, and remedial actions.[425] Ideally, the amount of financial assurances would be sufficient to cover all expenses should the bank fail. This study collected data from bank enabling instruments rather than investigating the operation of banks. As a result, the data collected did not allow for an evaluation of whether or not current financial assurances actually reflect the cost of bank establishment, monitoring, and long-term management.

Several options for financial assurances are presented in the 1995 banking guidance: performance bonds, irrevocable trusts, escrow accounts, casualty insurance, letters of credit, and legislatively-enacted dedicated funds for government operated banks. However, only four of the six types of financial assurances for the establishment of wetland mitigation banks are frequently employed. These assurances include performance bonds, letters of credit, escrow accounts, and trust funds (see section III "Financial assurances" for definitions). Other less common methods of financial surety are legislatively dedicated funds and operating budgets. Finally, one of the largest categories of "financial assurances," is a general statement in the banking instrument that the sponsor will assume financial responsibility for the establishment of the bank. This mechanism offers the weakest assurance that funds will be available to remediate problems in the case of bank failure. The majority of instruments that include this type of language are sponsored by public agencies.

In general, banks established by government entities continue to require very little in terms of financial assurances for bank establishment, oversight, and long-term management. Government-sponsored banks often maintain that they should not be required to secure financial assurances. Although, presumably, governmental agencies exist in perpetuity and have the financial credit of the state, local, or federal government behind them, governmental agencies are not immune from financial limitations. State legislatures may fail to appropriate adequate funds to meet obligations that are perceived as non-essential, or funding priorities may shift.

Absent a designated source of committed funds such as a letter of credit or escrow account, government-operated banks may be less likely to commit the resources necessary to remedy bank failure than some private banks. Of the banks operated by public agencies, just under half have specific financial assurances for bank establishment. Furthermore, of the 31 banks sponsored by state departments of transportation, 15 instruments state only that the sponsor is fiscally responsible for the bank's establishment and the remaining 16 instruments do not include any information on financial assurances for bank establishment. Only five of the 54 banks sponsored by a public agency strictly indicate specific financial assurances for bank oversight and only seven banks indicate distinct financial assurances for long-term management.

### Financial assurances: bank establishment

Given that virtually all banks release some portion of their credits prior to achieving any performance standards (see section IV. "Credit release") the use of financial assurances for bank establishment is an important element in assuring the bank's eventual ecological effectiveness. The more credits released prior to achieving performance standards the more critical the establishment of enforceable financial assurances becomes. In the event of bank failure, the MBRT or other responsible entity must be able to enforce accountability for withdrawn credits for which mitigation was not performed.

Today, the majority of the banks that require construction to become ecologically viable wetlands (i.e., non-preservation banks) have some form of financial surety associated with the construction, restoration, and/or enhancement of the bank. Of the approved banking instruments, 66 percent include financial assurances for bank establishment. Of the 168 banks established after 1995, 75 percent (126 banks) indicate financial assurances for bank establishment. It should be noted that financial assurance provisions may be available in documents other than the bank authorizing instruments, which were not consulted for the purposes of this study. The most common financial assurance for bank establishment is performance bonds; however, they only are applied in 32 percent of banks that designate the use of financial assurances.

[425] *Id.* at II. E. 5.

### Financial assurances: bank oversight

The second, and perhaps most critical category of financial assurances are bank oversight assurances. Financial assurances for bank oversight include funds for bank monitoring, maintenance, and contingency plans. If a bank does not have adequate capital set aside to maintain and place the bank firmly on the trajectory towards achieving ecological functionality there will inevitably be impacts that are never replaced. Of the banking instruments surveyed, 68 percent (150 banks) have information on financial assurances for bank oversight. Although a number of instruments still lack these assurances, there has been an increase in the use of bank oversight assurances since the 1995 banking guidance. Over half (56 percent) of the banks created before 1995 do not indicate financial assurances for bank oversight, whereas 21 percent of the banks created after 1995 lack financial assurances for bank oversight in the enabling instrument.

Similar to bank establishment, the most common form of financial assurance for bank oversight is the performance bond. Twenty-six percent of all banks require performance bonds. Other relatively common assurance mechanisms are escrow accounts (15 percent), letters of credit (11 percent), trust funds (9 percent), and interest bearing account (5 percent). The remainder of the banks (33 percent) indicate a variety of other mechanisms for financial assurances. The most common is to merely indicate that the sponsor is responsible for securing funds to operate and maintain the bank during its operational life.

In a handful of cases, financial assurances for bank oversight are tied to performance standards and are phased out as certain milestones are met. As confidence in the ecological effectiveness of the mitigation increases, financial assurances can decrease correspondingly. This approach serves as a valuable model and is a positive trend in wetland mitigation banking in recent years. The 1995 banking guidance suggests that financial assurances may be "phased-out or reduced, once it has been demonstrated that the bank is functionally mature and/or self-sustaining (in accordance with performance standards)."[426] For example, the banking instrument for WetBank—Gunnison in Colorado indicates that 33 percent of the performance bond will be released upon establishment of hydrophytic vegetation, 33 percent upon establishment of hydrophytic woody riparian vegetation, and the final 34 percent upon attainment of noxious weed control.[427] Only approximately 15 percent of the banking instruments that specify the length of the assurance, however, include this provision.

Of the 150 instruments that indicate financial assurances for bank oversight, only 61 indicate the duration of the required assurance. The relatively small portion of banking instruments that indicate this information may be attributed to stipulations in a state statute or guidance about the length of the assurance such as in Florida (see box "Financial assurances for phased banks —a Florida example"). In general, the majority of financial assurances for bank oversight are either linked to the monitoring period or to meeting performance standards. Often the length of time that the financial assurance must be held is extended when corrective measures are taken during the duration of the bank. For example, the Clay Station Bank in California indicates that financial assurances for maintenance will be released upon the fifth anniversary of the instrument's signing if there are no unresolved corrective measures requested by the MBRT.[429] Similarly, the instrument for the Burdell Mitigation Bank in California states that the bond will be released provided the bank meets the performance objectives specified in the resource management plan upon the later of either the fifth anniversary of the date of the MOA or the third anniversary of the remedial action most recently taken to meet the performance standards.[430]

Not all banks, however, link the release of the financial assurances to the end of the monitoring period. The banking instrument for the Boykin-Lillian Bank in Alabama states that the assurance will be released after the third year of operation or the completion of the bank development plan (whichever is later), despite the fact that the bank will be monitored until performance criteria are met.[431] Conversely, many banks have contingency funds that last beyond the monitoring period of the bank. For example, the American Equities Mitigation Land Bank at Reedy Creek in Florida has a main-

[426] *Id.*

[427] Still Water - Ohio Creek, LLP. *Banking Instrument for the WetBank – Gunnison Wetland Mitigation Bank.* Banking Instrument. Gunnison County, CO. 1999. 16.

[428] Fla. Admin. Code r. 62-342.700.

[429] Elliott Homes, Inc. *Clay Station Mitigation Bank Enabling Instrument.* Banking Instrument. Sacramento County, CA. 1999.

[430] Wildlands, Inc. *Mitigation Bank Enabling Instrument.* Banking Instrument. San Diego County, CA. 2000; Mount Burdell Enterprises/Burdell Ranch Partners, Ltd. *Memorandum of Agreement for the Burdell Ranch Wetland Conservation Bank Implementation Agreement.* Banking Instrument. Marin County, CA. 2000.

[431] Wetland Environmental Technologies. *Boykin/Lillian Mitigation Bank Mitigation Banking Instrument*. Banking Instrument. Mobile County, AL. 1999.

### FINANCIAL ASSURANCES FOR PHASED BANKS—A FLORIDA EXAMPLE

Another way to create flexibility within the system of financial assurances for bank oversight is to allow for the release of assurances based on phased bank construction. In Florida, 10 of the 32 banks are implemented in phases allowing the sponsor to secure and release smaller amounts of financial assurances. The Mitigation Banks Chapter of the Florida Department of Environmental Protection Rules states that the financial surety will last until "the bank or appropriate phase has been completely constructed, implemented, and trending towards success in compliance with the permit the respective amount of financial responsibility shall be released."[428] This technique is especially useful in Florida where banks are particularly large (up to 26,000 acres). Such a system not only ensures that the appropriate amount of financial assurance is applied given the degree of risk of bank failure, but allows the bank sponsor to free up additional funds as the bank begins to demonstrate ecological development.

tenance period of five years but the financial assurance is to last for 20 years.[432] This is also the case with a number of banks in Georgia, New Jersey, and Ohio where the monitoring period is set between three and 10 years and the financial assurance must endure until performance standards are met.

## Financial assurances: long-term management

Financial assurances for the long-term management and maintenance of a bank provide funding in perpetuity if necessary. Ideally, financial assurances for long-term management would be minimal or unnecessary because the bank would be monitored until the final performance standards are met and the bank would have been designed to be self-sustaining. Fewer than half of the banking instruments (71 of 154) that contain information on long-term maintenance also contain specific information on financial assurances for long-term maintenance. Unlike financial assurances for bank establishment and bank oversight, the most common form of financial assurance for long-term management is a trust or endowment fund (41 percent). The amount of funds that must be set aside for long-term maintenance and monitoring is established for a number banks by a pre-determined amount per credit sold. The highest amount specified is $8,400 per credit sold for the Rancho Jamul Mitigation Bank in California[433] and the lowest is $230 per credit sold for the Burdell Mitigation Bank in California.[434] Other banks have a set amount of funds put aside. For example, the permit for Panther Island Mitigation Bank in Florida indicates that over $1.1 million will be reserved for the long-term monitoring and maintenance of the bank.[435]

In the past 10 years there has been a steady increase in the inclusion of financial assurances for all aspects of bank operation, establishment, oversight, and long-term management. Although the increase in banks that employ such mechanisms is a positive trend, problems remain with both the consistency of how financial assurances are applied and with the usefulness of the assurances in instances of partial or total bank failure. As virtually all wetland mitigation banks allow advance debiting of credits, all banks—regardless of whether the sponsor is a public agency, private entity, or non-profit organization – should have a financial assurance for bank establishment. Financial assurances should also closely be tied to the amount of credits that can be sold in advance of meeting final performance standards. Higher levels of advanced debiting should coincide with larger financial assurances, with the assurances phased in decreasing amounts as performance standards are met.

An important step toward ensuring that financial assurances are included in all banking instruments is for states to require assurances as part of their rules on wetland mitigation banking. In Florida, for example, the rule on mitigation banking not only requires that all banks have assurances for implementation and long-term maintenance, it also provides standard forms for bank financial assurances.[436] The forms are based on the Resource Recovery and Conservation Act forms for financial assurances and are legally part of the rule. The use of standardized forms helps ensure that the state will in fact be able to collect funds should the bank fail.[437]

It has yet to be determined which type(s) of financial assurances are most useful to the regulator who must claim them when a bank fails to meet performance cri-

[432] American Equities #7 Ltd. *American Equities Mitigation Bank conceptual approval and permit for phase I and II construction, Wetland Mitigation Bank Permit Staff Report.* Permit. FL. 1997.

[433] Wildlands, Inc. *Mitigation Bank Enabling Instrument: Rancho Jamul.* Banking Instrument. San Diego County, CA. 2000.

[434] Mount Burdell Enterprises/Burdell Ranch Partners. *Memorandum of Agreement for the Burdell Ranch Wetland Conservation Bank Implementation Agreement.* MOA. Marin County, CA. 2000.

[435] South Florida Wetlands Joint Venture. *Environmental Resource Permit No. 11-00002-M.* Permit. Collier County, FL. 1999.

[436] Fla. Admin. Code r. 62-342.700.

[437] For more information on Florida's mitigation banking rule and standardized forms for financial assurances see the Florida Department of Environment web page at: <http://www.dep.state.fl.us/legal/legaldocuments/rules/rulelistnum.htm>. The forms can be found under section 62-342.

teria or achieve functional equivalency with a reference site. The experience of New Jersey, however, can be taken as a caution against assuming all financial assurances are equally effective. A failed bank in New Jersey used performance bonds as a financial assurance. When the bank first showed signs of failure the state regulatory agency's mitigation council attempted to call their bond. The threat of calling the bond caused the developer to begin to implement remedial actions at the site. New bonds were posted to cover the additional work necessary to bring the bank into conformance. A year later, however, the bank sponsor filed for Chapter 11 protection and then went bankrupt. The agency then discovered that the sponsor had failed to pay the bank premiums, making it impossible to call the bond. As a result of this experience, the state now recommends that banks use a letter of credit for their financial assurance.[438] The experience of New Jersey shows that, at a minimum, financial assurances should be current for the life of the bank, not renewable on an annual or bi-annual basis. Additionally, because calling financial assurances can be difficult, bank instruments should also include provisions for the suspension of the release of credits if the bank is operating at a deficit as a less cumbersome first step in enforcement.

The use of phased release of financial assurances is a useful tool as it can provide for flexibility for the sponsor while still securing the funds necessary to ensure that the bank meets either design criteria or performance criteria. Additionally, all bank financial assurances for monitoring and maintenance should be held, at least in part, until the bank meets final performance criteria. This is predicated on the assumption that the bank has meaningful performance criteria that create an ecologically effective wetland. Holding financial assurances until lackluster performance criteria are met serves very little purpose.

## PERFORMANCE STANDARDS IN PRACTICE

Ecologically based criteria—referred to as performance standards, success criteria, or release criteria—should be developed and used to measure the ecological effectiveness of compensatory mitigation. Performance standards are observable or measurable attributes used to evaluate whether a compensatory mitigation project is in compliance with the terms and conditions set forth in authorizing instruments.[439] Established standards should allow the MBRT, and in particular the Corps, to determine whether the objectives set forth in the banking instrument have been successfully fulfilled. They should also reflect the requirement of a minimum one-to-one replacement of wetland functions and acres.[440] Ideally, standards should measure a broad array of the major functions of wetland, particularly related to hydrology, vegetation, water quality, wildlife habitat, and soil.[441] Finally, performance standards should be easily measurable to facilitate enforcement in the case that a bank fails to meet permit or instrument conditions.[442]

### PERFORMANCE STANDARDS UNDER STATE LAWS AND REGULATIONS

Only two states—Florida and Maryland—require some form of performance criteria for banks in its statutes and regulations; and only two states—Iowa and Virginia—have performance requirements in banking guidelines (see box "Performance requirements"). Performance criteria can range from the general, (e.g., evidence of natural recruitment, wildlife utilization, native species dominance) to the specific (e.g., survivorship, percent cover, and composition of vegetation). Iowa is the only state that requires that created or restored wetland meet the criteria for jurisdictional wetlands. Iowa and Maryland restrict the presence of nonnative species. Florida, Iowa, and Virginia require hydrologic considerations.

[438] New Jersey Department of Environmental Protection. Telephone Interview. 28 Mar. 2002.

[439] Streever, W. *Examples of Performance Standards for Wetland Creation and Restoration in Section 404 Permits and an Approach to Developing Performance Standards.* Tech. Notes WRP WG-RS-3.3. Vicksburg: U.S. Army Engineer Research and Development Center, (Jan.) 1999.

[440] Streever, W. *Examples of Performance Standards for Wetland Creation and Restoration in Section 404 Permits and an Approach to Developing Performance Standards.* Tech. Notes WRP WG-RS-3.3. Vicksburg: U.S. Army Engineer Research and Development Center, (Jan.) 1999; Streever, B. "Performance Standards for Wetland Creation and Restoration Under Section 404." National Wetlands Newsletter 21:5 (May-June 1999): 10-13.

[441] Wilson, R. and W. Mitsch. "Functional Assessment of Five Wetlands Constructed to Mitigate Wetland Loss in Ohio, USA." *Wetlands* 16:4 (1996): 436-451; National Research Council. *Compensating for Wetland Losses Under the Clean Water Act.* Washington, D.C.: National Academy Press, 2001. 27 and 136.

[442] Streever, B. "Performance Standards for Wetland Creation and Restoration Under Section 404." National Wetlands Newsletter 21:5 (May-June 1999): 10-13.

## Performance standards in authorizing instruments

Approximately 65 percent of approved banks (135 banks) have performance standards outlined in their authorizing instruments.[443] Of the 75 banks without performance standards specified in their authorizing instruments, 35 allude to criteria contained in other supplemental documents, such as initial site proposals or management plans, or that were to be determined at a later date by the MBRT, bank sponsor, or based on specific sites or functional assessment results.[444] Since performance standards are not set forth in these banking instruments, it is unclear whether these criteria would be legally binding in a contested enforcement action or attempt to collect on a performance bond.

Over half of the banks without performance criteria in their instruments were established after the 1995 banking guidance.[445] In addition, there appears to be no correlation between bank type and whether or not banking instruments contain performance standards. Additional studies have found that universal performance standards have not been adopted nationwide to evaluate the ecological effectiveness or progress of banks.[446] However, performance standards for vegetation, hydrology, and the presence of non-native species are the most common found in banking instruments (see box "Parameters included in performance standards").

[443] Of the 219 approved banks, 135 banks have authorizing instruments that contain performance standards or success criteria, while 75 banks do not. For the remaining nine banks, it could not be determined whether or not performance standards are included in authorizing instruments since adequate documentation or information was not available. These nine banks are excluded from the calculations in this section.

[444] Of the 75 banks without performance standards in banking instruments: 40 did not mention standards or success criteria in the authorizing instruments; 25 indicate that standards or criteria are set forth in other supplemental documents, such as proposals or management plans; five indicate that that criteria would be based on functional assessment results, such as HEP results; and the remaining five indicate that criteria would be determined at a later date for specific sites by the MBRT or the bank sponsor.

[445] Of the 75 banks without specified performance standards, 49 were established on or after 1996; six in 1995; and sixteen before 1995. The date of establishment could not be determined for four banks.

[446] Streever, W. *Examples of Performance Standards for Wetland Creation and Restoration in Section 404 Permits and an Approach to Developing Performance Standards*. Tech. Notes WRP WG-RS-3.3. Vicksburg: U.S. Army Engineer Research and Development Center, (Jan.) 1999.

**Vegetation**

The research conducted as part of this study, as well as an earlier review of 110 compensatory mitigation projects in San Francisco, California, found that vegetation is the most common parameter used to measure bank performance.[447] Ninety-five percent of bank performance standards include vegetation measurements;[448] 40 of these banks have vegetation as the *only* criterion. Percent vegetation cover and density are the most commonly adopted parameters, followed by vegetation composition requirements, survivorship, or growth measurements. Vegetation cover, for example, includes certain percentages of cover of obligate wetland species and facultative wetland species. Densities, such as seedlings or plantings per acre, are also common bank site indices. Community structure is another common criterion, such as percent canopy versus percent groundcover species. Vegetation composition measurements include indices of diversity and dominance indices of listed target species. Survivorship and recruitment of specific indicator species or plantings and growth measurements, such as tree height and diameter, are frequently used.[449] The large majority of banks outlined multiple vegetation measurements (e.g., percent cover along with survivorship specifications), rather than simply relying upon one vegetation parameter.

The emphasis on vegetation to characterize bank performance is not surprising; vegetation parameters have been commonly used as primary indicators of wetland function(s).[450] The underlying assumption behind this approach is that if the vegetation community is healthy and exhibits adequate diversity, then the sup-

[447] Breaux, A. and F. Serefiddin. "Validity of Performance Criteria and a Tentative Model for Regulatory Use in Compensatory Wetland Mitigation Permitting." *Environmental Management* 24:3 (1999): 327-336.

[448] Of the 135 banks with performance standards outlined in their authorizing instruments, 128 had vegetation specifications.

[449] Breaux and Serefiddin found the following vegetation parameters were measured in compensatory mitigation projects, in order of frequency: percent cover (72 percent), percent survival (51 percent), species diversity/richness (35 percent), vigor (28 percent), species dominance (27 percent), height (25 percent), natural regeneration/recruitment (five percent), basal area (four percent), productivity (four percent), canopy stratification (three percent), root development (three percent), and density (two percent). *As cited in* Breaux, A. and F. Serefiddin. "Validity of Performance Criteria and a Tentative Model for Regulatory Use in Compensatory Wetland Mitigation Permitting." *Environmental Management* 24:3 (1999): 327-336.

[450] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act*. Washington, D.C.: National Academy Press, 2001. 130.

**TABLE 1.** Below are descriptions of performance requirements specified in the banking statutes, regulations, or guidelines in three states.

| State | Legal Authority | Performance Standards Specifications |
|---|---|---|
| Iowa | *Technical Guidance for Wetland Mitigation Banking in Iowa.* | Mitigation bank credits shall be certifiable by the MBRT when the bank credits conform to the following:<br>1. Wetlands created or restored for credit shall meet criteria for jurisdictional wetlands.<br>2. Wetland plant communities will be dominated by native species. In no case shall the wetland plant community be dominated by non-native species.<br>3. The mitigation bank is generally not dominated by a monocultural plant community.<br>4. Based on the National List of Plant Species that Occur in Wetlands: North Central (Region 3), more than 50 percent of the total plant cover within wetlands for which bank credit is sought shall be provided by species designated as obligate, facultative wetland, or faculative with a + modifier or no modifier.<br>5.Wetland hydrology must be independently demonstrated for each wetland plant community in the bank. |
| Maryland | Md. Regs. Code tit. 26, §23.04.03(J) | 1. The permittee or person conducting an agricultural activity shall successfully implement the approved mitigation plan within the time period required by the Department and specified in the mitigation plan.<br>2. Created or restored nontidal wetlands shall meet the following plant survival criteria:<br>a) After 5 years, greater than 85 percent of the site shall be vegetated by planted species approved by the Department or by a species composition agreed to by the Department;<br>b) Allowances shall be made for natural species changes as long as the plant communities are similar to those lost; and<br>(c) After 5 years, the nontidal wetland shall be dominated by native or adaptive vegetation.<br>3. In the case of a permittee or person conducting an agricultural activity, who has proposed the use of natural revegetation as part of the creation restoration, or enhancement project, after 5 years, greater than 85 percent of the site shall be:<br>a) Vegetated by species similar to those found in the nontidal wetland lost or by a species composition agreed to by the Department; and<br>b) Dominated by native or adaptive vegetation.<br>4. In the case where the nontidal wetland was dominated by exotic or nuisance plants, the Department shall accept out-of-kind mitigation.<br>5. The Department may not approve mitigation plans that include exotic or nuisance plants. |
| Virginia | Virginia Marine Resources Commission and the Virginia Institute of Marine Science. *Guidelines for the Establishment, Use and Operation of Tidal Wetland Mitigation Banks in Virginia.* January 1, 1998. < http://www.state.va.us/mrc/guideli.htm>. | The following performance standards will be used to determine credit availability and level of success of a tidal mitigation bank. For advance crediting to be considered, at a minimum the bank sponsor must satisfy items 1, 2, and 3.<br>1. MBRT approved banking instrument including specific marsh design and final elevation plans.<br>2. Acquisition of bank site and MBRT approved financial assurances in the form of a bond, letter of credit, etc.<br>3. Establishment and verification of proper tidal hydrology and substrate elevationsrelative to on-site tidal datum and satisfactory planting of bank site with proper wetland vegetation which clearly demonstrates an initiation of the wetland community type(s) specified in the banking instrument.<br>4. Minimum of 80 percent survival of plantings after the first growing season. If plant mortalities exceed 20 percent, the sponsor will have to replace those plantings or implement other remedial actions specified in the banking instrument.<br>5. Minimum 50 percent plant cover after one growing season.<br>6. Natural increase in the accumulation of organics in the bank substrate.<br>7. Natural recruitment of plant species within the bank.<br>8. Increasing primary production during the first three years.<br>9. Utilization by typical primary and secondary consumers.<br>10. Utilization by higher consumers (birds, mammals, fish, etc.). |

portive physical, biological, and biochemical processes must also be present.[451] Vegetative parameters are also relatively easier to measure and provide clear indicators of compliance relative to other measures, such as hydrology. However, NRC warns that relying solely upon vegetation—particularly just floristic assemblage as opposed to measuring community structure—may fail to accurately assess long-term sustainability of wetland systems and their necessary processes and components.[452]

**Hydrology**

Hydrology, including the variability in water levels and water flow rates, is the primary driving force influencing wetland development, structure, functioning, and persistence.[453] Including hydrology as an explicit performance standard makes sense from an ecological standpoint. Hydrology may be a preferred criterion for pragmatic reasons as well. Hydrologic restoration activities can be implemented in a short time period and can be measured through immediate water level responses. Plant community restoration is a lengthier process and requires sustained effort over a period of time, making necessary the establishment of interim performance milestones.[454]

Despite the importance of wetland hydrology, only a little over half of the banks with performance standards (78 banks) incorporate wetland hydrology criteria. This percentage, however, is higher than the 20 percent found in a survey of California banks.[455] Twenty-eight percent of banks with hydrologic criteria (22 of the 78 banks) measure mitigation success by the establishment of jurisdictional hydrology.[456] Twenty-six banks have other inundation or saturation frequencies specified or other hydrologic criteria, such as depth or duration of ponding or soil saturation requirements. The remaining 28 banks have hydrologic criteria that are more vague; for example, the instrument may simply indicate that "natural hydrology will be restored" or that hydrology must be considered when evaluating whether performance criteria have been met. More specific criteria may exist for these banks in other documents, such as in mitigation plans, but fail to be specified in mitigation banking instruments.

Due to climatic variability and to the fact that static water levels are not normal for many wetlands, except for some open-water wetlands, many wetland types do not satisfy jurisdictional criteria every year. The 2001 NRC report acknowledges the importance of incorporating hydrological variability into mitigation design and variation to account for this lack of predictability.[457] When mitigation sites are designed without consideration of hydrological variability, NRC found that "the result has often been sites with continuous open water and stable water levels and overly managed wetland vegetation."[458] This study found that hydrologic variability is rarely factored into bank performance standards.

**Water quality**

Water quality improvement is considered to be one of the most valuable functions provided by wetland systems. Wetlands improve water quality by trapping and filtering sediments, toxins, and pathogens and through nutrient removal and transformation. To assess these potential functions, both the quality and quantity of groundwater and surface water entering the wetland

**PARAMETERS INCLUDED IN PERFORMANCE STANDARDS**

Below are the parameters included in performance standards for the 135 banks that were approved as of December 2001. Most of these banks had standards with multiple criteria.

| Parameter | Number of Banks with Standards |
|---|---|
| Vegetation | 128 |
| Hydrology | 78 |
| Non-native Species | 38 |
| Wildlife Habitat | 13 |
| Reference Wetlands | 12 |
| Staged Criteria | 7 |
| Soils | 6 |
| Water Quality | 4 |
| Trajectories | could not be determined |

[451] *Id.*

[452] *Id.*

[453] *Id.* at 28.

[454] U.S. Army Corps of Engineers, Chicago district, U.S. Environmental Protection Agency and U.S. Fish and Wildlife Service. *Interagency Coordination Agreement on Wetland Mitigation Banking within the Regulatory Boundaries of Chicago District.* January 1997. <www.lrc.usace.army.mil/co-r/ica_all.htm>

[455] Breaux, A. and F. Serefiddin. "Validity of Performance Criteria and a Tentative Model for Regulatory Use in Compensatory Wetland Mitigation Permitting." *Environmental Management* 24:3 (1999): 327-336.

[456] The 1987 Wetland Delineation Manual defines the jurisdictional threshold for hydrology as follows: wetland areas must be inundated or saturated at least five percent of the growing season to be considered a jurisdictional wetland. U.S. Army Corps of Engineers. *Corps of Engineers Wetlands Delineation Manual.* Tech. Report Y-87-1. Vicksburg: Department of the Army Environmental Laboratory, (Jan.) 1987.

[457] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act.* Washington, D.C.: National Academy Press, 2001. 5.

[458] *Id.* at 149.

must be evaluated.[459] Less than three percent of banks (four banks) have water quality as an indicator of bank performance.[460] All but one of these banks has vague or nonspecific water quality standards. In most cases, the criteria state that the bank "must demonstrate water quality improvements" or "uptake or stabilize contaminants." The Florida Mitigation Bank, however, does indicate that the Florida Water Quality Index values are to be 15 percent above baseline (see table 2).[461]

**Soils**

Hydric soil is one of the three characteristics of a jurisdictional wetland, the other two being wetland hydrology and hydrophytic vegetation.[462] The USDA Soil Conservation Service defines hydric soil as "soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part."[463] Wetland soils play an important role in the overall functioning of a wetland, influencing hydraulic conductivity, nutrient availability, groundwater, seed germination, plant rooting and growth, and habitat for soil fauna.[464]

Soil functions, however, are often overlooked when evaluating wetlands. This study found that only six banks have performance standards that allude to hydric soils criteria (e.g., redox potential, pH, and salinity regimes). This is comparable to the three percent of California permits found to measure soils during project review.[465] The failure of mitigation projects to rely on hydric soil indicators to evaluate functional equivalency may be due to great uncertainty regarding the length of time needed for created wetlands to exhibit hydric soil features. Bank sponsors or agency regulatory staff may be suspect of using soil indicators given the short five-year monitoring period. Because hydric soils are slow to develop, in one banking instrument soils criteria are not proposed to measure bank functional equivalency but rather to simply gauge "developmental progress."[466] In contrast, in one case, a created deepwater marsh was able to develop hydric soil indicators and meet the accepted definition within five years of construction.[467]

**Wildlife habitat**

Wetlands provide vital habitat for a variety of fauna. After vegetation, wildlife is the next most common measured parameter in California wetland permits.[468] In contrast, none of the mitigation banks, in-lieu-fee projects, or permittee-provided mitigation sites visited by the NRC committee included criteria for animals.[469] This survey found that nine percent of banks (13 banks) include consideration of wildlife in performance standards. These standards reflect primary consideration for waterfowl, shorebirds, and indicator bird species, as well as threatened and endangered species. The most specific criteria require a functional assessment of specific wildlife utilization (see table 2).[470] The Fox Creek Stream Mitigation Bank in Missouri requires measurement of nesting pairs of specific indicator species and composition requirements of fish and aquatic invertebrate communities.[471] In contrast, wildlife is generally measured qualitatively by assessing "evidence of use."[472]

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[459] *Id*. at 30.

[460] Similarly, Breaux and Serefiddin found that seven percent of Section 404 permits in San Francisco exhibited water quality criteria; Breaux, A. and F. Serefiddin. "Validity of Performance Criteria and a Tentative Model for Regulatory Use in Compensatory Wetland Mitigation Permitting." *Environmental Management* 24:3 (1999): 327-336.

[461] D&J Ranch Inc. *Florida Department of Environmental Protection Permit 492924779.* (Florida Mitigation Bank) Permit. Osceola County, FL. 1997.

[462] U.S. Army Corps of Engineers. *Corps of Engineers Wetlands Delineation Manual*. Tech. Report Y-87-1. Vicksburg: Department of the Army Environmental Laboratory, (Jan.) 1987.

[463] U.S. Department of Agriculture. *Hydric Soils of the United States.* Washington, D.C.: Soil Conservation Service, 1985.

[464] Mitsch, W., and J. Gosselink. *Wetlands, 2nd Edition.* New York: Van Nostrand Reinhold, 1993.
National Research Council. *Compensating for Wetland Losses Under the Clean Water Act*. Washington, D.C.: National Academy Press, 2001. 32.

[465] Soils criteria measured in California permits were: soil grain size, nutrients, pH, salinity, soil colors related to saturation/oxidized root channels, texture, porosity, moisture, and conductivity. *As cited in* Breaux, A. and F. Serefiddin. "Validity of Performance Criteria and a Tentative Model for Regulatory Use in Compensatory Wetland Mitigation Permitting." *Environmental Management* 24:3 (1999): 327-336.

[466] City of North Platte, Nebraska. *Final Banking Instrument North Platte Wetland Mitigation Bank: North Platte, Nebraska.* Banking Instrument. Lincoln County, NE. 2000.

[467] Vepraskas, M., J. Richardson, J. Tandarich, and S. Teets. "Dynamics of Hydric Soil Formation Across the Edge of a Created Deep Marsh." *Wetlands* 19:1 (1999): 78-89.

[468] Breaux, A. and F. Serefiddin. "Validity of Performance Criteria and a Tentative Model for Regulatory Use in Compensatory Wetland Mitigation Permitting." *Environmental Management* 24:3 (1999): 327-336.

[469] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act*. Washington, D.C.: National Academy Press, 2001. 31.

[470] D&J Ranch Inc. *Florida Department of Environmental Protection Permit 492924779.* (Florida Mitigation Bank) Permit. Osceola County, FL. 1997.

[471] Fox Creek, L.L.C. *Memorandum of Understanding Between Fox Creek L.L.C. and The U.S. Army Corps of Engineers.* MOU. St. Louis County, MO. 2000.

[472] Breaux, A. and F. Serefiddin. "Validity of Performance Criteria and a Tentative Model for Regulatory Use in Compensatory Wetland Mitigation Permitting." *Environmental Management* 24:3 (1999): 327-336.

The remaining instruments that specify wildlife habitat performance standards have general requirements, such as qualitative evidence of wildlife utilization or an increase in mean annual number of nesting and migrating shorebirds.

**Invertebrates**

Invertebrates play a vital role in wetland communities.[473] They constitute an important component of the food web and help to recycle nutrients and breakdown organic matter. Invertebrate abundance and diversity can serve as indicators of wetland conditions, for example water quality and wildlife habitat. Similar to soil parameters, invertebrates are generally not factored into wetland evaluations. Only three of the banking instruments surveyed have invertebrate parameters specified as performance standards. These standards include such criteria as invertebrate species richness and composition.

**Reference sites**

To account for the natural hydrological variability of most wetlands, NRC recommends that hydrological functionality be based on comparisons to reference wetlands during the same time period.[474] One of the best measures of wetland functionality is to determine whether or not the mitigation wetland provides the same level of functionality as a high quality and representative natural reference wetlands in the region.[475] Reference wetlands are selected because they sustain a high level of functionality and should be central to the development of benchmarks to assess restoration efforts.[476] Natural wetlands have been used as reference systems to evaluate the performance of restored, enhanced, or created bank sites.[477] The HGM approach, applicable to most wetlands, relies upon reference systems to measure ecological equivalency, which is considered an effective measure of permit compliance.[478]

Reference wetlands, however, are infrequently used to determine the level of functionality a replacement wetland should achieve. Only 12 banks, or nine percent, of those surveyed indicate that reference systems are used to assess bank performance.[479] Most requirements are fairly general in description, indicating that reference sites (often preserved portions of the banks or areas adjacent to the site) would be used to establish "target conditions," characteristic hydrology, community structure, or species richness. Klamm Mitigation Bank and Trinity River Mitigation Bank, both in Texas, are examples of banking instruments with vague performance standards, generously construed as relying upon "reference" system, because they simply require

[473] Invertebrates include aquatic insects, freshwater crustaceans (e.g., amphipods, crayfish), aquatic annelids (worms), zooplankton, and immature stages of certain terrestrial insects (e.g., Lepidoptera) that occur mainly in wetlands. *As cited in* Adamus, P.R. 1996. Bioindicators for assessing ecological integrity of prairie wetlands. EPA/600/R-96/082. Corvallis, OR: U.S. Environmental Protection Agency, Environmental Research Laboratory.

[474] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act*. Washington, D.C.: National Academy Press, 2001. 5.

[475] Mitsch, W., and R. Wilson. "Improving the Success of Wetland Creation and Restoration with Know-How, Time, and Self-Design." *Ecological Applications* 6:1 (1996): 77-83.

[476] Brinson, M. and R. Rheinhardt. "The Role of Reference Wetlands in Functional Assessment and Mitigation." *Ecological Applications* 6:1 (1996): 69-76.

[477] Streever, W. *Examples of Performance Standards for Wetland Creation and Restoration in Section 404 Permits and an Approach to Developing Performance Standards.* Tech. Notes WRP WG-RS-3.3. Vicksburg: U.S. Army Engineer Research and Development Center, (Jan.) 1999.

[478] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act*. Washington, D.C.: National Academy Press, 2001. 114.

[479] Ecosystems Land Mitigation Bank Corporation. *Agreement to Establish the Barra Farms Cape Fear Regional Mitigation Bank in Cumberland County, North Carolina.* Banking Instrument. Cumberland County, NC. 1999; Ecological Associates Inc. *Black River Bottomland Hardwoods Wetland Mitigation Banking Instrument.* MOA. Williamsburg County, SC. 1998; Moore, James E. III. *Boran Ranch Mitigation Bank, Permit No. 4914074.02.* Permit. DeSoto County, FL. 1997; South Carolina Department of Transportation. *Huspa Creek Mitigation Banking Instrument.* MOA. Beaufort County, SC. 1997; KLAMM Inc. *Mitigation Banking Agreement Klamm Mitigation Bank Smith County, Texas.* Banking Instrument. Smith County, TX. 1998; Foster Wheeler Environmental Corporation. *Mitigation Bank Permit 0140969-001.* (Loxahatchee Mitigation Bank). Permit. Palm Beach County, FL. 2000; Manning Company. *Friends Neck Wetland Mitigation Bank, Final Banking Agreement.* Banking Instrument. Kershaw County, SC. 1995; Ridgeline Resource Planning. *Mud Slough Wetland Mitigation Bank Mitigation Bank Final Instrument.* Banking Instrument. Polk County, OR. 2000; Hudgins. Gerald *Final Banking Instrument: Mulberry River Mitigation Bank.* Banking Instrument. Barrow County, GA. 2000; Tampa Bay Mitigation, L.L. C. *Southwest Florida Water Management District Environmental Resource Individual Construction Permit No. 43020546.000.* (Tampa Bay Mitigation Bank). Permit. Hillsborough County, FL. 2001; Wetland Partners. *Mitigation Banking Instrument Agreement Trinity River Mitigation Bank, Ltd.* Banking Instrument. Tarrant County, TX. 2001; Abiqua Engineering, Inc. *Memorandum of Agreement Between Weathers Mitigation Bank Review Team and Harley and Emilie Weathers and Don Causey.* Banking Instrument. Gervais, OR. 1998.

that the bank exhibit "characteristics of a viable bottomland hardwood wetland community."[480]

Four of the 12 banks with reference to natural wetlands indicate that hydrological parameters exhibited by the bank should be characteristic of the reference systems.[481] The hydrologic goal for Mulberry River Mitigation Bank is for the wetland area to be "saturated within 12 inches of the surface for a duration and frequency comparable to or *exceeding* the wetland reference site."[482] This type of flexibility may result in the bank site not being characteristic of a reference wetland but rather wetter, which is an overall problem among mitigation sites (see section IV. "Wetland types available for crediting").[483]

**Non-native species**

Non-native species threaten the productivity and sustainability of wetland systems by altering community composition, causing native species declines, and disrupting ecological patterns and processes.[488] One sign of disturbed and degraded wetland habitat is the presence of non-native invasions. After vegetation and hydrologic criteria, requirements specifically limiting the occurrence of invasive and/or nuisance plant species constitute the third most common performance criteria. Almost 30 percent of the banks (38 of the 135 banks) specify non-native and nuisance species limitations. Of these 38 banks, 31 list specific percentages for which non-native species should not exceed total vegetation coverage. The ranges span from one percent up to 30 percent of total vegetation cover.[489] That restrictions on the non-native species coverage is the third most common element used to judge bank performance —superceding soil, water quality, or wildlife indicators—is likely due to the ease of measurement as opposed to this parameter's indication of wetland functionality.

**Staging**

Performance standards may include requirements that are staged over time such that different standards are to be met as a wetland matures.[490] This staged ap-

**BANKS THAT UTILIZE REFERENCE SITES TO DETERMINE BANK PERFORMANCE**

Boran Ranch Mitigation Bank, Mud Slough Wetland Mitigation Bank, Black River Bottomland Hardwoods Wetland Mitigation Bank, Friends Neck Wetland Mitigation Bank, and Loxahatchee Mitigation Bank use reference sites to determine bank performance. The topography, substrate, water depth, hydroperiods, and vegetation zone for Boran Ranch Mitigation Bank are required to be similar to that of the preserved/reference site.[484] Mud Slough Wetland Mitigation Bank in Oregon is required to meet or exceed 80 percent of the species richness of the reference site by the end of the five-year monitoring period and Friends Neck Wetland Mitigation Bank requires that the tree species diversity be equal to or greater than the reference site.[485] The depth and duration of flooding, species diversity, and mean species densities are to be consistent with a reference ecosystem for Black River Bottomland Hardwoods Wetland Mitigation Bank in South Carolina (see table 2).[486] Loxahatchee Mitigation Bank in Florida actually quantifies the types of species and their densities in the reference system, requiring that the mitigation site meet these standards; in addition, reference wetland data are used to assess successful wildlife and fish usage on site.[487]

[480] KLAMM Inc. *Mitigation Banking Agreement Klamm Mitigation Bank Smith County, Texas.* Banking Instrument. Smith County, TX. 1998.
Wetland Partners. *Mitigation Banking Instrument Agreement Trinity River Mitigation Bank, Ltd.* Banking Instrument. Tarrant County, TX. 2001.

[481] Ecological Associates Inc. *Black River Bottomland Hardwoods Wetland Mitigation Banking Instrument.* MOA. Williamsburg County, SC. 1998; Moore, James E. III. *Boran Ranch Mitigation Bank, Permit No. 491 4074.02.* Permit. DeSoto County, FL. 1997; Hudgins. Gerald *Final Banking Instrument: Mulberry River Mitigation Bank.* Banking Instrument. Barrow County, GA. 2000; Tampa Bay Mitigation, L.L. C. *Southwest Florida Water Management District Environmental Resource Individual Construction Permit No. 43020546.000.* (Tampa Bay Mitigation Bank). Permit. Hillsborough County, FL. 2001.

[482] Hudgins. Gerald *Final Banking Instrument: Mulberry River Mitigation Bank.* Banking Instrument. Barrow County, GA. 2000. Emphasis added.

[483] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act.* Washington, D.C.: National Academy Press, 2001. 29.

[484] Moore, James E. III. *Boran Ranch Mitigation Bank, Permit No. 491 4074.02.* Permit. DeSoto County, FL. 1997.

[485] Ridgeline Resource Planning. *Mud Slough Wetland Mitigation Bank Mitigation Bank Final Instrument.* Banking Instrument. Polk County, OR. 2000; Manning Company. *Friends Neck Wetland Mitigation Bank, Final Banking Agreement.* Banking Instrument. Kershaw County, SC. 1995.

[486] Ecological Associates Inc. *Black River Bottomland Hardwoods Wetland Mitigation Banking Instrument.* MOA. Williamsburg County, SC. 1998.

[487] Foster Wheeler Environmental Corporation. *Mitigation Bank Permit 0140969-001.* (Loxahatchee Mitigation Bank). Permit. Palm Beach County, FL. 2000.

[488] Cox, G. *Alien Species in North America and Hawaii: Impacts on Natural Ecosystems.* Washington, D.C.: Island Press, 1999.

[489] One bank indicates that non-native invasive coverage shall not exceed 30 percent, another indicates 20 percent, three indicate 15 percent, 11 indicate 10 percent, eight indicate five percent, and seven indicate between one to three percent.

[490] Streever, W. *Examples of Performance Standards for Wetland Creation and Restoration in Section 404 Permits and an Approach to Developing Performance Standards.* Tech. Notes WRP WG-RS-3.3. Vicksburg: U.S. Army Engineer Research and Development Center, (Jan.) 1999.

proach generally means that varying standards (e.g., percent cover of hydrophytic vegetation and percent survival of species) are staged over the five-year monitoring period. Only seven banks surveyed have adopted this incremental method, including three in Missouri,[491] two in Virginia,[492] and one each in Georgia[493] and Oregon.[494]

**Trajectories**

Wetland restoration and creation sites are often unable to achieve functional equivalency with reference sites during the specified five-year monitoring period.[495] Rather than requiring longer monitoring periods, many regulatory agencies adjust performance standards in banking instruments such that they are appropriate to this short time frame.[496] Adjusted performance standards, however, may fail to adequately measure the ability of the mitigation site to replace lost wetland functions or values over the long-term.

To improve the replacement and reestablishment of "hydrological, geochemical, and ecological processes" that support wetland functions over time, appropriate short-term predictors of system development need to be incorporated into compliance criteria.[497] Research has shown that wetlands may follow particular developmental pathways or trajectories through time.[498] Such wetland trajectories, if better understood, could possibly be used to determine whether or not a mitigation wetland is on the path to becoming a functional and sustainable wetland. If wetland ecosystems are shown to follow certain developmental pathways, and evaluators are able to develop reliable indicators of future outcomes, then shorter monitoring periods could be supported for wetland types that require a particularly lengthy time period to become established. The data reviewed for this study, however, do not reveal whether or not banks have adopted performance standards based on wetland trajectories.

**STAGED PERFORMANCE STANDARDS IN A MISSOURI BANK**

The Lower Missouri River Mitigation Bank in Missouri illustrates how performance standards may be varied throughout the five-year monitoring period (see table 2). This bank is required to achieve the following: by the end of the first growing season, herbaceous vegetation shall be composed of at least 40 percent hydrophytic species and the relative cover of listed species should total at least 40 percent; survival of woody vegetation should be at least 50 percent. By the end of the second growing season, vegetation should be composed of at least 75 percent hydrophytic species with a total cover of at least 50 percent; and woody vegetation survival should be at least 50 percent. At the end of the third growing season vegetation should be composed of at least 75 percent hydrophytic species with a total cover of at least 60 percent; and woody vegetation survival should be at least 60 percent. By the end of the fourth growing season, vegetation should be composed of at least 75 percent hydrophytic species with a total cover of at least 70 percent; and woody vegetation survival should be at least 65 percent. By the end of the fifth growing season vegetation should be composed of at least 75 percent hydrophytic species with a total cover of at least 75 percent; and woody vegetation survival should be at least 75 percent.

## Performance standards and mitigation ratios

As supported by the 1995 banking guidance, a number of banks alter their mitigation ratios based on whether or not the bank sponsor has met performance standards. If performance standards have not yet been

[491] Mid River Wetland Restoration. *Big Rivers Wetland Mitigation Bank.* Banking Instrument. Pike County, MO. 1999; The Jones Company. *Memorandum of Agreement Among the USACE, USEPA, USFWS, MODNR, MODC and Lower Missouri River, L.L.C.* (Lower Missouri River Mitigation Bank). MOA. St. Louis County, MO. 1999; Rosedale Mitigation, LLC. *Memorandum of Agreement; Rosdale Wetland Mitigation Bank Mitigation Project.* MOA. St. Charles County, MO. 2000.

[492] Cedar Run Wetlands, L.C. *Cedar Run Wetlands Bank, Banking Instrument.* Banking Instrument. Prince William County, VA. 2000; Virginia Department of Transportation. *Mattaponi Wetland Banking Agreement.* Banking Instrument. Caroline County, VA. 2001.

[493] PineSouth, Inc. *PineSouth Mitigation Banking Plan.* Banking Instrument. Jefferson County, GA. 2000.

[494] Ridgeline Resource Planning. *Mud Slough Wetland Mitigation Bank Mitigation Bank Final Instrument.* Banking Instrument. Polk County, OR. 2000.

[495] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act.* Washington, D.C.: National Academy Press, 2001. 45.

[496] *Id.* at 149.

[497] Simenstad, C. and R. Thom. "Functional Equivalency Trajectories of the Restored Gog-Le-Hi-Te Estuarine Wetland." *Ecological Applications* 6:1 (1996): 38-56.

[498] Kentula, M., R. Brooks, S. Gwin, C. Holland, A. Sherman, and J. Sifneos. An Approach to Improving Decision Making in Wetland Restoration and Creation, A. Hairston, ed. EPA/600/R-92/150. Corvallis, OR: U.S. Environmental Protection Agency, Environmental Research Laboratory. 1992 (August); Environmental Law Institute. *Stakeholder Forum on Federal Wetlands Mitigation.* Washington D.C.: Environmental Law Institute, December 2001; National Research Council. *Compensating for Wetland Losses Under the Clean Water Act.* Washington, D.C.: National Academy Press, 2001.

**TABLE 2.** Summary of performance standards for select approved-active banks in the U.S.

| Bank Name | Year | Total Acreage | Performance Standards |
|---|---|---|---|
| Lower Delta Mitigation Bank Site, AR | 1999 | 290 Acres | 1) Plant establishment will be a minimum survival rate of 50% following each of the 1st and 2nd complete growing seasons; 2) if a 50% survival rate is not achieved after the 1st and 2nd growing seasons an appropriate number of seedling will be planted to acquire a minimum density of 100 seedlings per acre; 3) successful colonization by desirable species as certified by a professional biologist; 4) documentation certifying plant density will be submitted annually for 5 years. |
| Indian Creek Wetland Mitigation Bank, GA | 2000 | 124 Acres | Hydrologic success criteria will consist of monitoring the groundwater as it is restored across the site. The hydrology success criterion will be considered successfully met once the site maintains wetland hydrology as defined by the 1987 Corps of Engineers Wetland Delineation's Manual. Vegetative success criteria will be divided into three major variables that will be measured for success: (1) tree seedling survival - at least 75% of the total planted, based on the monitoring results of each year's monitoring; (2) root collar diameter - an increase in the root collar diameter each year, based on the results of each year's monitoring; (3) seedling height - an increase in the height of the planted seedling each year, based on the results of each year's monitoring. |
| Florida Mitigation Bank, FL | 1997 | 1582 Acres | Nuisance and exotic vegetation must not exceed 1% of the total cover; listed species reproducing naturally; % cover of site of obligate and facultative wet remains the same or is increasing; enhancement areas inundated through wet season, wetland hydrology variable in M-WRAP is 3; wildlife utilization variable in M-WRAP is 3; attraction of threatened and endangered species, documented increase in abundance of aquatic invertebrates, and Florida Water Quality Index values 15% above baseline. |
| Lower Missouri River Mitigation Bank, MD | 1999 | 16 Acres | At the end of the 1st growing season herbaceous vegetation should be composed of at least 40% hydrophytic species and the relative cover of listed species should total at least 40%; survival of woody vegetation should be at least 50%. At the end of the 2nd growing season vegetation should be composed of at least 75% hydrophytic species with a total cover of at least 50%, woody vegetation survival should be at least 50%. At the end of the 3rd growing season vegetation should be composed of at least 75% hydrophytic species with a total cover of at least 60%, woody vegetation survival should be at least 60%. At the end of the 4th growing season vegetation should be composed of at least 75% hydrophytic species with a total cover of at least 70%, woody vegetation survival should be at least 65%. At the end of the 5th growing season vegetation should be composed of at least 75% hydrophytic species with a total cover of at least 75%, woody vegetation survival should be at least 75% |
| North Platte Wetland Mitigation Bank, NE | 2000 | 25 Acres | (1) Established and self-sustaining vegetation (surveyed in permanent vegetation plots for a minimum of 3 growing seasons) will consist of greater than 50% Facultative (FAC), Facultative Wetland (FACW) or Obligate Wetland (OBL) plant species. Specific species to be planted in the bank are identified in the Planting Prescription section of Exhibit B. (2) The minimum requirement for wetland hydrology in a seasonally inundated or saturated wetland is saturation of the root zone for 12.5% of the growing season. With the growing season approximately 154 days long, this equates to saturation of Bank soils for a minimum of 20 days. Hydrology of the Bank is designed to have areas of saturation or inundation for much of the growing season. (3) Features that indicate hydric soils development, e.g., low chroma mottling, gleyeing and low redox potentials, appear relatively slowly. Therefore, monitoring requirements to meet the hydric soils criteria are not proposed. However, on-site hydric soil determination will be conducted, not for meeting success criteria, but for measuring developmental progress. |
| Pio Costa Wetlands Mitigation Bank, NJ | 1995 | 158 Acres | Project will be considered successful when the applicant demonstrates that wetlands have been created, restored, and enhanced as shown in the approved plans and that the site has an 85% survival and 85% areal coverage of the mitigation plantings. |
| Black River Bottomland Hardwoods Mitigation Bank, SC | 1998 | 82 Acres | Unit 1: 1) The removed roadway sections will remain clear of obstructions; 2) Depth and duration of flooding will be consistent with the adjacent, unaltered Reference Ecosystem (RE); 3) Data for the two systems should be comparable to within 10%. Unit 2: 1) Mean density of 200 trees/shrubs per acres; 2) A minimum of 50% survival of planted species; 3) Establishment of 50% coverage of woody and herbaceous groundcover that includes at least 30% of species dominant in the RE; 4) Less land 10% of the area comprised of nuisance and/or upland species; 5) Inundation depth and/or soil water table data comparable to the RE. |

met, the mitigation site may be assigned fewer credits per acre. For example, the banking instrument for Beach Lake Mitigation Bank in California specifies a mitigation ratio of one credit per three acres of woody riparian wetland and two acres of freshwater wetland prior to performance standards being met. The ratio, however, is lowered to one credit per one acre for both wetland types once the bank has met performance standards.[499] To account for a possible temporal lag between permitted impacts and the replacement of wetland functions, two banks—Nelson County Wetland Mitigation Bank in Kentucky[500] and Weisenfeld Mitigation Bank in Florida[501]—require higher ratios for projects withdrawing credits if performance standards at the bank have not yet been met. The fact that bank credits are available for sale, however, does not necessarily guarantee that the required mitigation has been effectively completed. To compensate for this fact, the Weisenfeld Mitigation Bank has established replacement ratios based on the degree to which performance standards have been met at the time of credit release: 20:1 if no criteria have been met, 10:1 if two of the criteria have been met, 8:1 if four have been met, and 6:1 if all have been.

**INDIANA'S SITE DEVELOPMENT PLANS**

Through its Interagency Coordination Agreement on Wetland Mitigation Banking, Indiana requires that each wetland mitigation bank prepare and submit a site development plan for final MBRT approval. Bank site plans must identify and incorporate the following items:

1. Diverse aquatic and supporting landscapes (e.g. shallow open water, riparian wetlands, deep and shallow marshes, floodplain forest, wet meadows and prairies, and upland buffers), which are interrelated so as to maximize wetland functions and values;
2. Diverse wildlife habitats;
3. Associated upland buffer areas contiguous to the wetlands to protect the wetlands from potential adverse effects of adjacent land use, specifying the width and area (acres) of all buffer zones;
4. Wetland functions which will be created or enhanced;
5. Plant species native to the area;
6. The type and source of soils;
7. The means for establishing the appropriate hydrology, including adequate storage for flood control, flow distribution, and water quality management;
8. Design, maintenance, and monitoring procedures that minimize energy needs, human intervention, cost, and weed and pest control, including burnings.

Source: *Interagency Coordination Agreement on Wetland Mitigation Banking within the State of Indiana.* <www.lrl.usace.army.mil/orf/info/ICA1097.html>

## DESIGN STANDARDS

Performance standards are measurable criteria, generally based on biological criteria, used to assess wetland functionality (see section IV. "Performance standards in practice"). A more prescriptive approach to measuring compliance with mitigation banking instruments is the use of design standards. Design standards are predetermined requirements or specifications, physical or biological, for how a wetland site is to be constructed or mitigated (e.g., specifications related to planting schemes or hydrologic engineering).

A mitigation bank may fail to meet functional performance for several years—often many years beyond the traditional five-year monitoring period. For this reason, a MBRT may elect to measure banks against an approved construction and design plan rather than performance criteria.[502] This typically requires the submission of site assessments, plans, or detailed construction and operating information to the lead regulatory authority. Certification of designs by accredited wetland professionals, monitoring of construction activities, submission of as-built drawings, and progress reports may also be required.[503] In theory, these plans and assessments should be approved before credits are generated or withdrawn from the bank.

Both performance standards and design criteria are essential components of mitigation banking instruments. These benchmarks are essential for authorizing agencies to evaluate whether or not banks are meeting the conditions of the authorizing agreement. Without these measures, the regulatory agencies would be unable to assess bank failure and make a defensible enforcement case to ensure that the bank will mitigate for

[499] California Department of Transportation (Caltrans). *Agreement on Mitigation Strategy Pertaining to Implementation and Operation of the Beach Lake Mitigation Bank.* MOA. Sacramento County, CA. 1991.

[500] Replacement ratio is 2:1 for advance sale of credits (before bank performance) and 1.5:1 for post-credits (after bank performance is determined). *As cited in* PTRL Environmental Services. *Nelson County Wetland Mitigation Bank Number One, Memorandum of Agreement.* MOA. Nelson County, KY. 1997.

[501] Weisenfeld, Joseph J. *Florida Department of Environmental Regulation Permit No. 48&491639319.* (Weisenfeld Mitigation Bank). Permit. Orange County, FL. 1990.

[502] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act.* Washington, D.C.: National Academy Press, 2001. 15.

[503] Environmental Law Institute. *Wetland Mitigation Banking.* Washington D.C.: Environmental Law Institute, 1993. 98.

permitted losses. In many cases, these measures are used to define the credit release schedule and the amount of financial assurances that are needed at different stages of bank establishment.

Since uniform requirements and protocols for the inclusion of design standards in banking instruments are unavailable, it is difficult to determine the number of banks that have used the design approach.[504] In addition, design standards are often specified in supplementary documents other than bank authorizing instruments, for which adequate documentation was not readily available. However, this survey found that approximately 65 banks have adopted some form of design standards—as evidenced by reference to particular plans (e.g., bank/site development, implementation, mitigation, construction, or design plans), as-built surveys, or more in-depth site development protocols outlined in instruments. A smaller number of banks—around 40 banks—include detailed design specifications in banking instruments. Topics generally covered in design plans are: bank establishment goals; baseline site conditions; hydrologic regimes; hydrologic modification methods; grading plan; planting schemes; construction schedule; construction costs; monitoring methods; management plans (e.g., prescribed fire management plans); and maps exhibiting site location, soils, and water flow patterns.

Overall, MBRTs rely more on performance standards than design standards to evaluate bank compliance with authorizing instruments. Seventy-two percent of the 65 banks with detailed design specifications are also backed by performance standards. In these cases, performance standards are used to evaluate compliance (e.g., performance rather than design criteria were tied to a credit release schedule).[506]

After reviewing the 65 banking instruments with design standards, it becomes clear that no standard exists for the type and range of information used to evaluate effective bank design and construction. As recognized by NRC and some regulatory agencies, the development of a clear definition of design standards—particularly minimum requirements—would improve the success of mitigation sites in achieving established mitigation goals.[507]

Design standards provide a safeguard to better ensure appropriate siting and construction of mitigation banks. Preventing the establishment of ill-designed and ill-sited banks may be the best way to circumvent future non-compliance and mitigation failure. The measures can be clearly written, followed, and once met, may absolve the bank sponsor of further liability; thus design standards are often favored over performance standards by those constructing banks.

In its 2001 study, the NRC recommends that the Corps develop a reference manual to help "design projects that will be most likely to achieve permit requirements."[508] NRC envisioned a series of manuals developed for each Corps region that is based on the wetland functions outlined in the 404(b)(1) guidelines. However, considerable disagreement remains about the appropriateness of such a manual. Requiring a specific wetland design does not necessarily ensure the establishment of an ecologically effective mitigation site that will replace the intended wetland functions. If a bank is established that meets design standards, but the site never becomes a functional wetland, the regulatory agencies may have no enforcement recourse or ability to re-

### DESIGN STANDARDS IN A WASHINGTON STATE UMBRELLA BANK

The authorizing instrument for the Snohomish County Airport Wetland Compensation Bank, an umbrella agreement in the state of Washington, includes requirements for each proposed site to provide a comprehensive site development plan. This banking program has detailed over 65 elements to be included in each site development plan, covering topics such as compensation goals and objectives; quantitative performance standards (including wildlife, aquatic resources, vegetation, hydrologic regime, morphometry, soil, and water quality); description of the site; preliminary site design; protection plan, implementation schedule; management and maintenance; and monitoring.[505] (This banking instrument is provided as a model. However, it and other umbrella banks have not been included in the bank numbers throughout this section.)

[504] Regulatory agencies have difficulty defining "design standards" or even "performance standards." NRC found that the problem with definitions further complicates compliance enforcement of design or performance standards. *As cited in* National Research Council. *Compensating for Wetland Losses Under the Clean Water Act.* Washington, D.C.: National Academy Press, 2001. 94.

[505] Snohomish County Airport. *Snohomish County Airport Wetland Compensation Bank Program Memorandum of Agreement, July 1, 1996.* MOA. WA, 1996.

[506] Eighteen of the 65 banks with design standards did not have performance criteria outlined in the banking instruments.

[507] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act.* Washington, D.C.: National Academy Press, 2001. 97-101; Environmental Law Institute. *Stakeholder Forum on Federal Wetlands Mitigation*. Washington, D.C.: Environmental Law Institute, April 2002. 28-29.

[508] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act.* Washington, D.C.: National Academy Press, 2001. 168.

quire remedial measures. Further, prescriptive design criteria may be overly constricting and may inhibit innovation.[509]

Because the activities needed to establish a functional wetland will differ significantly from site to site, it may be difficult to develop standards that can be applied in different situations. When using design standards, it becomes important to adopt an adaptive management approach, specified in the banking instrument, so that design standards can be altered to ensure that ecological goals are met.

Another approach gaining acceptance is the development of minimum submission design standards. The location and design of project sites may be the most significant determinant of bank performance.[510] The first step of seeking approval for a proposed wetland mitigation bank is for the bank sponsor to submit a prospectus to the MBRT. At this initial stage, the bank sponsor should be required to demonstrate to the regulatory agency(ies) that the proposed bank site will meet some minimum standards. New Jersey has adopted a well-defined, standardized approach, which could serve as a model for the Corps (see box "New Jersey minimum submission requirements).[511]

## BANK OPERATION AND OVERSIGHT

A formal monitoring system is an important element of wetland mitigation bank establishment and use. Monitoring not only helps ensure the long-term ecological effectiveness of a bank, but can lead to improved daily management as well. Many potentially severe problems with banks can be avoided or greatly lessened through regular monitoring and subsequent maintenance. Bank monitoring can be defined as the act of measuring bank conditions and comparing them to either set performance criteria or reference wetlands. Bank maintenance includes actions taken by the bank sponsor or other entity to assure that the bank meets these goals. Monitoring and maintenance are also critical elements in establishing the ecological and financial success of a bank. The MBRT can use the data supplied thorough monitoring procedures to determine whether performance criteria are being met and, in many cases, the amount of credits released in a given year.

In the early 1990's, requirements for monitoring and maintenance of mitigation bank sites were sparse, if not non-existent. Today, most wetland mitigation banks include at the very least references to monitoring and maintenance provisions in the enabling instrument. Monitoring and maintenance requirements are generally specified in the instrument itself or are referenced in the authorizing instrument and further detailed in a separate monitoring and maintenance document. A third option is to tailor the monitoring and maintenance requirements for each year of operation according to the needs indicated in the annual monitoring report from the previous year. Whichever of these options the bank sponsor chooses, bank instruments increasingly include criteria which, in theory, should aid them in becoming functional wetlands.

### Monitoring and reporting provisions

Monitoring reports are generally required annually for the first five years of the bank. The focus of nearly all monitoring programs for banks is on vegetative cover and hydrology. Hydrologic monitoring is most commonly conducted through the use of wells or periodic visual observation. To monitor the establishment of vegetation, many bank sponsors survey sample plots to determine the overall health and recruitment of the plant population at the site. This approach is often combined with a comparison of the bank's conditions to reference sites.

The 1995 banking guidance states that "monitoring provisions should be set forth in the banking instrument and based on scientifically sound performance standards prescribed for the bank."[512] Although it is difficult to determine based on the information in many instruments, monitoring provisions are generally based on the performance standards for the bank. This is understandable because of the 178 instruments that utilize credit release schedules, 95 percent base credit release on achieving performance milestones. Therefore, the bank needs to be monitored to determine if the milestones have been met and additional credits can be released.

[509] Environmental Law Institute. *Stakeholder Forum on Federal Wetlands Mitigation.* Washington, D.C.: Environmental Law Institute, April 2002.

[510] Environmental Law Institute. *Wetland Mitigation Banking.* Washington D.C.: Environmental Law Institute, 1993. 95-100.

[511] Freshwater Wetland Mitigation Council and the Department of Environmental Protection. *Wetland Mitigation Bank Proposal: Checklist for Completeness.* Trenton: New Jersey Department of Environmental Protection, November 1, 2001. <http://www.state.nj.us/dep/landuse/forms/forms.html#FWW>.

[512] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks.* 60 Fed. Reg. 228, 58605-58614. 1995.

A crucial element of bank monitoring provisions is the length of bank monitoring. Of the 127 approved banks in the United States that indicate monitoring length, no bank is monitored for less than three years, and the majority (64 percent) only require monitoring for up to five years. Overall, 4 percent of these banks require from three to five years of monitoring, with two banks requiring only three years, another two requiring four years, and one bank requiring between three to five years. The majority of banks, 76 banks (60 percent), require monitoring for five years. Twenty-one percent of banks require more than five years with 16 percent (20 banks) requiring between six to 10 years, and 5 percent (seven banks) requiring anywhere from 11 to 50 years. Only 12 percent (15 banks) require site monitoring until specified performance criteria are reached; 1 percent (one bank) with monitoring until credits are sold-out. The remaining 2 percent (three banks) have combined monitoring criteria in which one bank requires monitoring for either five years or until performance is met; a second requiring either five years or until credits are sold-out; and a third requiring either 10 years of monitoring or until credits are sold-out—whichever time-period is longer. Other sites, such as the Missouri Agricultural Wetland Mitigation Bank, tie the monitoring period to assurances that the mitigation has been ecologically effective.[513]

Although it is encouraging that the majority of banks monitor for at least five years, a five-year monitoring period may be insufficient for many wetland types. Ideally, all banks would have their monitoring periods directly linked to achieving final performance criteria, thereby ensuring the development of a functional wetland. The length of many bank monitoring periods, however, is inadequate. Certain types of created and restored systems, such as woody riparian systems, require long periods for plant establishment. For these systems, a period of five years or less is not sufficient to determine if the mitigation will achieve functional equivalency with a reference site. In fact, 50 years or more may be necessary for tree-dominated sites to mature.[514] Forested wetlands are not the only wetland type that should be monitored for longer periods. For example, a Virginia marsh constructed in the mid 1970's was not considered "successful" until 1986 when a major hydrologic change occurred at the site.[515]

### NEW JERSEY MINIMUM SUBMISSION REQUIREMENTS

The New Jersey Department of Environmental Protection has developed and published a checklist of minimum submission requirements for mitigation bank proposals. The checklist outlines information that must be provided by each bank sponsor prior to bank approval, including:

- Location of proposed site (with copy of USGS quad map showing location);
- Explanation of reason bank proposal is being pursued;
- Description of the size and type of mitigation bank (creation, enhancement, restoration, etc.) proposed;
- Delineation of limits of jurisdictional wetlands as defined by the 1989 Federal Manual for Identifying and Delineating Wetlands;
- Certification that the site is not affected by hazardous or solid waste or contamination, and surface water, groundwater or soil contamination;
- Certification that site contains no structures that present health or safety problems to the general public;
- Completion of wetland functional assessment of exist ing site conditions and of proposed conditions;
- Description of how proposed bank site interacts with surrounding regional wetland and aquatic resources;
- Projected water budget for proposed site, which should detail the water sources for the project as well as water losses. The water budget must contain sufficient data to show that the mitigation project will have sustained wetland hydrology indefinitely in the future;
- Existing soil profiles with the location of soil borings on the proposed mitigation site;
- Detailed description of substrate proposed to create mitigation site;
- Landscape plan showing the proposed vegetation community on the proposed mitigation site that includes the quantity of each species; the spacing of all plantings; timing of plantings; the stock type; and the sources of the plant material;
- Maintenance plan to control invasive or noxious vegetation and how predation of the mitigation plantings will be prevented;
- Cost estimate of construction of bank, which will be used to justify financial assurance;
- Site plans for bank, including existing and proposed elevations and grading; soil and seed mix used, explanation of how micro-topography will be created; pre- and post-construction plan views; and location of monitoring wells and/or stream gauges to monitor and record the hydrology of the mitigation site;
- Construction schedule, including projected dates of excavation, planting, fertilizing, etc.;
- Certification that the proposed site will not adversely affect listed or eligible historic sites.

[513] Agricultural Conservation Innovation Center. *Mitigation Banking Instrument, Missouri Agricultural Wetland Mitigation Bank Pilot Project.* Banking Instrument. Stoddard County, MO. 1999. 8b.

[514] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act.* Washington, D.C.: National Academy Press, 2001. 112.

[515] Morgan, Kenith and Thomas Roberts. *An Assessment of Wetland Mitigation in Tennessee.* Nashville: Tennessee Department of Environment and Conservation, Environmental Policy Office, 1999. 53.

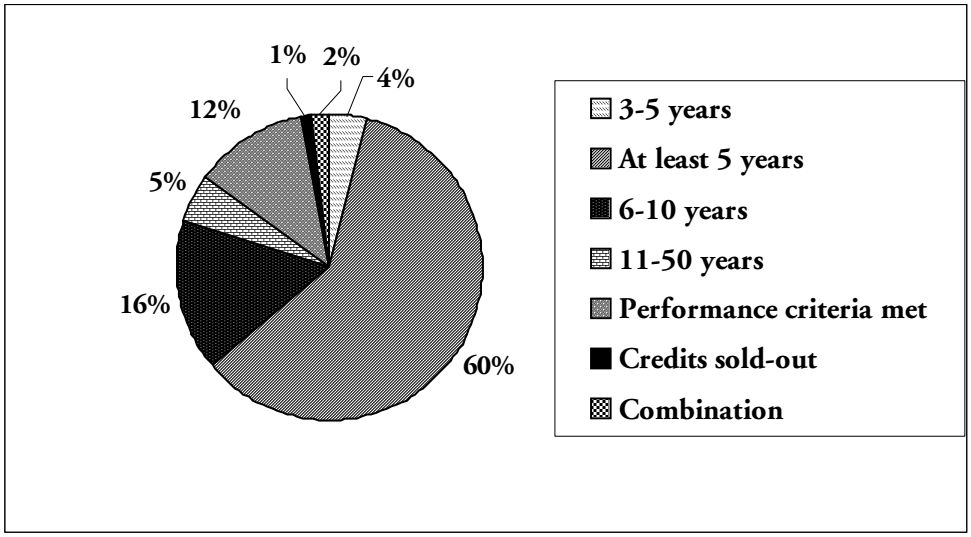


**FIGURE 6.** Proportions of wetland mitigation banks with required monitoring lengths of 3-5 years; at least 5 years; 6-10 years; 11-50 years; until performance criteria have been met; until all bank credits have been sold; or some combination of criteria. The combined criteria required for three banks were as follows: bank monitoring to occur for 5 years or until performance criteria has been met; 5 years or until all credits have been sold; or 10 years or until all credits have been sold (whichever is longest).

Tying the monitoring period to the achievement of performance standards may help ensure that mitigation is ecologically effective. Such requirements may take many forms. For example, the Treyburn-Collier Mitigation Bank in Florida must be monitored and maintained "for a period of five years or until the performance criteria established for the bank site have been met."[516] The banking instrument for the Trinity River Mitigation Bank in Texas indicates that the "Sponsor shall monitor the condition of the bank and its progress towards achieving the goals and performance standards of the [bank] by conducting periodic surveys until the Sponsor can demonstrate to the satisfaction of the MBRT that all performance standards have been achieved."[517] Another variation, only found in a handful of banking instruments, such as the Delta Mitigation Bank in Mississippi and the Missouri Agricultural Wetland Mitigation Bank, requires the banks to be monitored for a set number of years, (five and three years respectively), beyond achieving the performance standards.[518]

There are also a number of banking instruments that indicate set periods for monitoring (e.g., five years) but require financial assurances until performance criteria are met. In practice, monitoring periods for these banks are likely extended until performance criteria are met. Without monitoring, the bank sponsors would be unable to demonstrate that performance standards have been met, and therefore would be unable to be released from financial assurances. This trend occurs predominantly in New Jersey and Georgia. For example, the banking instrument for the Etowah River Stream Mitigation Bank in Georgia stipulates a five-year monitoring period but also states "Release of financial assurance will occur at the end of the five-year monitoring period if the mitigation bank has established vegetation in accordance with the success criteria."[519] The Wyckoff's Mills Wetland Mitigation Bank instrument in New Jersey has a monitoring length of at "least three years" and states that "all remaining financial surety will be released after the Council determines…that the mitigation bank is a success."[520]

[516] Florida Wetlands Stewardship Group, Inc. *Wetland Mitigation Banking Staff Report, South Florida Water Management District Mitigation Banking Permit No. 11-00003-M.* Permit. Collier County, FL. 2000. 12.

[517] Wetland Partners. *Mitigation Banking Instrument Agreement Trinity River Mitigation Bank, Ltd. Permit Application No. 199800370.* Tarrant County, TX. 2001. 20.

[518] Heineke and Associates, Inc. *Mitigation Bank Agreement Delta Mitigation Bank.* Banking Instrument. Tallahatchie County, MS. 2001.

[519] Wetland & Ecological Consultants, LLC. *Final Banking Instrument-Revised Etowah River Stream Mitigation Bank.* Banking Instrument. Dawson County, GA. 2001. 7.

[520] New Jersey Wetlands Mitigation Council. *Resolution Adopted by the New Jersey Wetlands Mitigation Council Conditionally Approving the Wyckoff's Mills Wetland Mitigation Bank.* Resolution. Middlesex County, NJ. 1997. 5.

Although monitoring the bank until final performance standards are met is important, in the end the issue of effective monitoring criteria and sufficient monitoring periods is dependent on both how well the bank is designed and sited at the outset. The length of monitoring periods should be based upon meeting ecologically sound performance criteria and would necessarily vary in length based on the wetland type. For wetland types that could take upwards of 50 years to meet performance criteria, the monitoring frequency could potentially be reduced once a sufficient period has passed to ensure that the bank is on a positive trajectory towards achieving performance criteria. For example, a bank with a 50-year monitoring period could require annual monitoring for the first five to 10 years, biannual monitoring for the next 20, and then monitoring every five years for the final 20 years. Such an effort may go a long way towards ensuring that the mitigation bank does indeed replace the impacted wetland functions.

### Maintenance criteria

Bank maintenance activities are undertaken to either encourage or repair certain elements of the bank. The maintenance criteria most commonly designated in authorizing instruments are the control of invasive species and prescribed burning. Additional maintenance criteria in banking instruments include: grading, repair/maintenance of fences if needed to keep out cattle and the public, maintenance of berms, sediment erosion control, and trash removal. Most enabling instruments, however, do not include detailed information on bank maintenance requirements. Maintenance information is generally cursory, not present at all, or most often part of a separate bank management plan. Therefore, for many banks it is difficult to determine the rigor of the specific maintenance criteria. Occasionally, maintenance requirements are found in banking instruments under a section addressing contingency plans. This is generally the case when the bank is either designed to be self-sustaining from the very beginning with no anticipated maintenance or when the bank consists of predominantly preservation credits. For example, the Friends Neck Wetland Mitigation Bank in South Carolina contains a maintenance and remedial action section that states: "any deficiencies relating to attainment of final performance criteria will be noted in the annual monitoring reports. The bank operator will propose interim remedial measures as needed to respond to undesirable developments that occur during the five-year monitoring period."[521]

In general, enabling instruments do not include much information on maintenance criteria. Ideally, most banks would be designed and sited such that maintenance requirements are minimal. Banks that are not self-sustaining may require the use of control structures, such as tide gates or pumps that require long-term maintenance, making the banks subject to vandalism and other natural events that if not consistently monitored could diminish the effectiveness of the wetland over time.[522]

### Contingency plans/remedial actions and responsibilities

The provision for contingency plans as well as the funds to implement those plans can be an essential component in the ecological effectiveness of a bank. Contingency plans for banks are particularly important for wetland types that are difficult to replace. Ideally, every bank should anticipate the areas of potential failure and provide detailed action plans, as well as adequate funding to conduct remediation. The 1995 banking guidance suggests that contingency plans should be included in the enabling instruments. The guidance states:

> The banking instrument should stipulate the general procedures for identifying and implementing remedial measures at a bank…Remedial measures should be based on information contained in the monitoring reports (i.e., the attainment of prescribed performance standards), as well as agency site inspections. The need for remediation will be determined by the authorizing agency(ies) in consultation with the MBRT and bank sponsor.[523]

The vast majority of mitigation bank authorizing instruments recognize the need for contingency plans and remedial actions. The instruments generally indicate that it is the bank sponsor's responsibility to implement contingency plans or remedial actions. The implementation of contingency plans and remedial actions can generally proceed in one of two ways: 1) the sponsor suggests the remedial actions, the MBRT approves the actions, and the sponsor implements the measures;

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[521] The Manning Company. *Friends Neck Wetland Mitigation Bank, Final Banking Agreement.* Banking Instrument. Kershaw County, GA. 1995. 11.

[522] Kentula, Mary. "Wetland Restoration and Creation." *National Water Summary on Wetland Resources.* Water-Supply Paper 2425. Washington, D.C.: United States Government Printing Office, 1996. 89.

[523] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks.* 60 Fed. Reg. 228, 58605-58614. 1995.

or 2) the MBRT suggests the remedial actions and the sponsor implements the measures. In some cases, notably many of the banks in California, the remedial actions are only mandatory if the bank is operating at a deficit (i.e., more credits have been sold than generated). Of the 219 approved banks analyzed, 73 percent, or 162 banking instruments, have some information on contingency plans. Fifty-six percent of the bank instruments approved before 1995, however, do not include contingency plan information.

The varied nature of contingency plans does not lend itself to categorization. However, there are a few general formats that contingency plans tend to follow. For example, many banks in Georgia and South Carolina specifically outline the potential remedial actions based on the anticipated deficiencies of the bank, e.g., adjustment of weirs to raise/lower inundation levels, additional seeding if areas are not meeting prerequisite stem counts, etc.[524] Other instruments do not provide specific remedial actions within their contingency plans, but do highlight the aspects of the bank that have the highest probability for failure. For example, the instrument for the Flint Creek Wetland Mitigation Bank in Alabama states, "There is potential for partial failure primarily with vegetation success and the introduction of adequate hydrology."[525]

Other enabling instruments do not contain any detail on remedial actions but rather indicate that any corrective actions, if necessary, will be outlined as part of the yearly monitoring report. Finally, a handful of banks use the presence of noxious species as the trigger for remedial action. For example, the Northeast Florida Mitigation Bank states that remedial maintenance must be performed within 30 days of the discovery of a 10 percent or greater coverage by nuisance or exotic vegetation.[526] For information on the enforcement of remedial actions, see section IV. "Remedial actions and enforcement."

[524] Callaway Lakes L.L.P. *Callaway Farms Mitigation Bank.* Banking Instrument. Harris County, GA. 1998. Appendix B. and Ecological Associates Inc. *Black River Bottomland Hardwoods Mitigation Bank, Banking Plan.* Banking Instrument. Williamsburg County, VA. 1998. 8-9.

[525] Robinsong Ecological Resources, Inc. "Wetland Bank Site Plan" in *Memorandum of Agreement Flint Creek Wetland Mitigation Bank.* MOA. Morgan County, AL. 1998. 9.

[526] Mitigation Solutions, Inc. *Individual Environmental Resource Permit technical Staff Report, Northeast Florida Wetland Mitigation Bank.* Permit. Duval County, FL. 1997. "Other Conditions" #9.

### Long-term management

One of the advantages of wetland mitigation banking is the opportunity to protect wetlands in perpetuity. Since the permitted impacts are, in theory, permanent, so too should be the mitigation required to compensate for those impacts. The vast majority of the banks established today are not held in perpetuity by the bank sponsor; rather they are transferred to a public agency or non-profit organization in the business of land preservation. This trend alleviates what would be a financial burden on the part of the bank sponsor involved with maintaining a non-performing asset.[527] In fact, bank sponsors may be able to realize some compensation credit, tax deduction, or promotional value from the land donation itself.

There are a number of ways for the long-term transfer of a bank site to proceed. The land may be deeded directly to a public resource agency, non-profit organization, or independent banking entity. Alternatively, the bank sponsor may retain or sell the land, but convey a conservation easement to a public resource agency or non-profit organization. This option can include deed restrictions or covenants running with the land. Finally, land may be sold with a reversionary interest given to a public agency to ensure that the wetland is maintained.[528]

Specific details on long-term management requirements are rare in enabling instruments. However, some do require the submission of a closure plan that will, presumably, address many of the issues surrounding the long-term management of the bank site. The instruments that do contain specific information about long-term maintenance usually include requirements to control non-native invasive species, maintain water levels and fences, and periodically examine the site for vandalism. For some banks, "long-term" maintenance of the bank is just an extension of the normal maintenance period with quarterly inspections and replanting of vegetation or hydrologic adjustments when needed. Often the long-term management and maintenance sections of a banking instrument state that the procedures will simply be consistent with terms of the easement or covenant.

Of the 219 banking instruments analyzed, 44 percent indicate information on long-term management requirements. Of the banking instruments that indicate information on long-term management, six percent specify that the bank was designed such that no

[527] Environmental Law Institute. *Wetland Mitigation Banking.* Washington, D.C.: Environmental Law Institute, 1993. 113.

[528] *Id.* at 114.

long-term maintenance will be necessary. Well over half —65 percent—of all wetland mitigation banks provide information designating the entity that will own the bank following its operational phase. In most cases, the long-term landowner is the same entity as that designated to manage the bank following its operational phase. Seventy-two percent of the banks indicate long-term managers. Banking instruments identify five categories of long-term managers: 56 identify a public agency, 34 indicate the sponsor, 22 specify that a non-profit organization will hold the land, 16 state that either a non-profit organization or a public agency will be the holder, and 18 do not designate the land owner. This last category includes banks that do not specify the long-term manager in the instrument, as well as sites where the instrument specifically states that the site will not have a long-term manager.

A large part of the long-term management of a bank is assuring that the bank remains a protected wetland in perpetuity. The vast majority of banking instruments contain language providing for long-term legal assurance that the land will remain undeveloped and relatively undisturbed. Of the 219 instruments reviewed, 76 percent indicate future land protection mechanisms. Of the banks that indicate information on long-term protection of the land, 48 percent specify conservation easements, 20 percent restrictive covenants, 18 percent deed restrictions, and 14 percent specify that another form of long-term protection will be used. Overall, 37 percent of the single-user banks do not include legal assurances as opposed to the eight percent of private commercial banks that do not have assurances indicated. Once a conservation easement or other legal mechanism is in place, in the vast majority of circumstances, the land is assured protection in perpetuity. In Louisiana, however, the life of a mitigation bank is only 20 years for marsh mitigation banks or 50 years for forested wetland mitigation banks.[529] Therefore, wetland acreage in Louisiana banks could potentially be filled and used for purposes other than replacing wetland functions or could be sold again for mitigation in the future.

Conservation easements held by state or local government, or federal agencies other than the Corps, or non-governmental groups may be preferable to deed restrictions.[530]

The restrictions on the land created by legal assurances were not exhaustively reviewed for the purposes of this study. A number of banking instruments, however, indicate these provisions, providing information on the degree of protection that the land will receive in the future. For example, 29 banks specifically indicate that the public will have access to the land and 10 specify that the public will not. The remaining banks may, however, indicate these limitations in the deed restrictions themselves. Many instruments indicate that the bank site can be used for any purpose consistent with the functioning of the wetland. These activities could potentially include hunting and hiking. In Washington State, there has been considerable debate about whether or not hunting should be allowed on lands where mitigation banks are located. Some state agency officials fear that if the public is granted permission to hunt on bank lands, there will be increased pressure to design deepwater wetlands that provide suitable habitat for ducks and other hunted species.[531]

Although banking instruments do not offer much information about long-term management of banks, this provision is worthy of attention. While the bank sponsor should have some sense of how the bank will be used in perpetuity, it may not be necessary to prescribe detailed information in the enabling instrument. If this information is omitted from the banking instrument, the instrument should require that a long-term management plan be submitted as a requirement for the release of credits. Ideally, all banks would be designed to ensure minimal long-term maintenance and monitoring so little financial investment in maintaining the wetland in perpetuity is necessary. Additionally, all banks should remain wetlands, protected in perpetuity, and should have some form of legal assurance to guarantee this status.

## REMEDIAL ACTIONS AND ENFORCEMENT

Rules and provisions for the operation of mitigation banks are useless unless they are enforced. Other studies have demonstrated that, on the whole, enforcement of compensatory mitigation projects is sparse.[532] This study found nothing to indicate that enforcement actions for failed wetland mitigation banks are any more frequent or stringent than for other types of compensa-

[529] La. Admin. Code tit. 43:I, §724.

[530] U.S. Army Corps of Engineers. *Regulatory Guidance Letter, No. 01-1.* "Guidance for the Establishment and Maintenance of Compensatory Mitigation Projects Under the Corps Regulatory Program Pursuant to Section 404(a) of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899." Washington, D.C.: U.S. Army Corps of Engineers. October 31, 2001.

[531] Army Corps of Engineers, Seattle district. Telephone Interview. 20 Dec. 2000.

[532] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act.* Washington, D.C.: National Academy Press, 2001. 156-57.

tory mitigation. Despite the lack of information on the frequency of enforcement, wetland mitigation banks may be easier to enforce than other forms of compensatory mitigation for a number of reasons. First, enforcement provisions may be written directly into banking instruments. Second, because wetland mitigation banks consolidate mitigation into a few large sites instead of many small sites, compliance monitoring and enforcement may be more streamlined.[533] Third, when credit release is tied to performance standards, it is easier to enforce compliance since credits aren't released until specific standards are attained.

In examining the enforceability of mitigation banking instruments, there are a number of factors to consider. The first is who the responsible party is if the bank should fail. If the bank enabling instrument does not clearly identify the liable party or parties it will be difficult to enforce the conditions of the instrument. Liability for the performance of wetland mitigation banks takes different forms. In the case of the single-user bank the liability remains with the permittee, whereas with a commercial bank the liability falls on the sponsor of the bank. To ensure that the bank sponsor is legally responsible for the creation of the credits, "the bank sponsor should sign such permits [Clean Water Act §404 and/or Rivers and Harbors Act §10] for the limited purpose of confirming that those [mitigation] responsibilities are enforceable against the bank sponsor if necessary."[534] Assignment of liability for commercial banks is useful in two ways. First, it clarifies the responsible party in the case of bank failure. Second, it allows the permittee to transfer their liability for mitigation to another party, making mitigation banking a more attractive option.

Bank enabling instruments should also include clear enforcement provisions. In 1992, the enabling instruments for the banks in existence at the time contained little if any information on remediation and enforcement provisions.[535] Today, many instruments indicate the method of action to be taken should the bank fail to comply with contingency plans for not meeting performance criteria or other milestones. There are a number of ways that enforcement of contingency plans and their remedial actions can proceed. Of the 162 banking instruments that include information on contingency plans, approximately 31 percent include information on potential enforcement mechanisms. The most common enforcement mechanism, employed by 65 percent of the banks with enforcement measures indicated, is to stop the debiting of credits from the bank until remedial actions have been preformed. An extreme example is the Boykin-Lillian Wetland Mitigation Bank in Alabama. The instrument for the bank states "If initial plan fails, the Sponsor will develop contingency plans and implement appropriate remedial actions for the Bank in coordination with the MBRT. Sponsor must implement its remedial actions within 30 days or the MBRT will recommend appropriate remedial actions. If remedial actions are not met, the long-term stewardship funds will be transferred to the long-term steward to undertake corrective measures."[536] Most commonly however, the sponsor will be given a year to implement the remedial actions before the financial assurances are appropriated.

A few instruments indicate that if the bank is not operating at a deficit, the number of credits will be adjusted downward in lieu of remediation. For example, the instrument for the Tosohatchee Mitigation Bank in Florida states, "in the event that some portion(s) of the mitigation area does not meet the applicable success criteria . . . [the sponsor] will revise the mitigation plan as necessary or accept a reduction in credits."[537]

Another far less common method of enforcement of remedial actions is to annul the authorizing instrument if they are not taken within a certain period of time. For example, if remedial action is not taken within 18 months at the Pearl River Mitigation Bank in Mississippi, the MBRT will cease to recognize the bank and the sponsor will be required to implement mitigation to replace all the unsuccessful mitigation or the sponsor will forfeit their financial assurances.[538] Banks in Kentucky require liens to ensure that should the sponsor suffer dire financial stress or bankruptcy, the contingency money and the property will be transferred to the Kentucky Department of Fish and Game. Finally, a number of banks suggest that the monitoring period for the bank may be extended if remedial actions are necessary.

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[533] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995.

[534] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act.* Washington, D.C.: National Academy Press, 2001. 86

[535] Environmental Law Institute. *Wetland Mitigation Banking*. Washington, D.C.: Environmental Law Institute, 1993. 52.

[536] Wetland Environmental Technologies. *Boykin/Lillian Mitigation Bank Mitigation Banking Instrument*. Banking Instrument. Mobile County, AL. 1999.

[537] Florida Department of Transportation. *Florida Department of Transportation Tosohatchee Mitigation Bank Enabling Instrument.* Banking Instrument. Duval County, FL. 1997. 9.

[538] BL Properties, L.L.C. *Pearl River Mitigation Bank Area Leake County, Mississippi Final Agreement.* Banking Instrument. Leake County, MS. 2001.

Although determining the effectiveness of bank enforcement is difficult from a survey of authorizing instruments, there have been a number of changes in banking instruments in recent years that set the stage for more effective enforcement. The first is that more banking instruments today include remedial action provisions and specify consequences if remedial actions are not followed. Similarly, enforcement tools (i.e., financial assurances for active bank life and legal assurances for after bank life) are more widely employed today than in the early 1990s. More consistent use of such mechanisms may provide greater opportunity for regulatory agencies to enforce bank conditions if necessary.

The prevalence of performance criteria, as opposed to design standards, in banking instruments can also be beneficial from an enforcement perspective. Although easy to monitor, adherence to design standards may not always guarantee the mitigation of a functional wetland. Even if design measures are followed, poorly designed wetlands can limit the ability of a bank to replace lost wetland functions. If performance criteria are adhered to, however, it is more likely that the desired functions will be provided. At least one state, Indiana, stresses performance criteria over design criteria for this very reason. State wetland regulators in Indiana feel that there is a "trade-off with design criteria from an enforcement standpoint. When design criteria are dictated to an applicant, if those criteria are met and the project fails, there is no opportunity for enforcement, as the permittee has met their requirements."[539]

Caution should be taken, however, when banks are allowed to debit prior to achieving final performance standards. While enforcement could assure the prompt correction of any failures, adequate enforcement does not often occur due to limited staff, resources, and political will.[540] Additionally, even when enforcement is undertaken, it is not always effective, especially if the development activity has already taken place. Once the developer has been absolved of their mitigation responsibility by purchasing credits and the credit producer has been compensated for with the purchase of credits, the regulatory agency's leverage to obtain corrective action is diminished. This can result in a lack of a compliance incentive on behalf of both parties (if different entities).[541]

Another issue that may affect enforcement is whether or not the bank sponsor is a public entity. Enforcement by one state agency against another state or local agency can be difficult, although not impossible.

Finally, the structure of the bank enabling instrument itself can be key to enforcing bank conditions. In general, enforcement is easiest when the enabling instrument is a permit because the responsible parties are directly indicated.[542] The use of a Memorandum of Understand (MOU), MOA, or banking instrument can potentially be equally enforceable provided that they clearly indicate the responsible party. If the responsible party is not directly identified in the enabling instrument, however, the conditions of the agreement are difficult to enforce.

### History of performing remedial actions or enforcement

The data generated from this study did not allow for an assessment of whether, or how often, remedial actions and enforcement provisions are employed. In some cases this may be because many of the banks and banking programs in states are fairly new and have not had much experience addressing banks that function below expectations. In fact, 65 percent of all banks have been created in the past four years. In addition, in most cases when banks are experiencing problems, such as hydrological shortcomings or high vegetation mortality, the lead regulatory agency tends to work directly with the bank sponsor to implement corrective measures rather than begin formal enforcement proceedings or relying upon financial assurances. Unfortunately, negotiations with bank sponsors on remedial measures often continue for years past the point when regulators have faith in the ability of the bank to ever perform as envisioned in the banking instrument. In many cases, the MBRT may certify only a fraction of the bank's credits, even if those credits do not meet the ecological criteria envisioned, rather than seek remedial action to ensure that the full array of wetland functions permitted for loss are replaced.

In interviews with state agencies and Corps districts, some anecdotal information revealed how regulatory authorities tend to handle banks performing below expectations. When the White Cedar Bank in Virginia

[539] Environmental Law Institute. *Stakeholder Forum on Federal Wetlands Mitigation*. Washington, D.C.: Environmental Law Institute, 2002.

[540] Race, M.S., and M.S. Fonseca. Fixing compensatory mitigation: What will it take? *Ecol.Applic.* 6(1):94-101. National Research Council. *Compensating for Wetland Losses Under the Clean Water Act.* Washington, D.C.: National Academy Press, 2001. 122.

[541] Environmental Law Institute. *Wetland Mitigation Banking*. Washington, D.C.: Environmental Law Institute, 1993. 97.

[542] *Id.* at 110.

failed to meet the stem count outlined in the performance standards, the state regulatory agency reevaluated the number of credits available at the bank. The bank sponsor has since addressed the problem of establishing cedar trees and some of the bank's credits have been released.[543] In Mississippi, when a portion of the Stennis Space Center Bank site burned, the bank sponsor conducted remedial measures and the bank is now considered to be in compliance.[544]

The New Jersey Department of Environmental Protection has encountered a number of problems with banks, providing insight into potential enforcement problems and solutions. In the past few years, New Jersey has had problems with three of its mitigation banks. The agency has found that performance bonds have not been an effective financial assurance. Bonds are difficult to call and by the time the money from them is received it may be far less than the full value of the bond. In addition, in the past the bonds were allowed to be renewed on a yearly basis. In one instance, when the bond needed to be called the agency found that the sponsor had failed to pay the yearly premiums on it, making it impossible to call. For these reasons, the agency now encourages bank sponsors to use letters of credit for financial assurances. Bonds, however, can still be used but the sponsor must have in escrow all the bond premiums due for the life of the project.

The increase in contingency plans and enforcement provisions for assuring that remedial actions are taken is a positive change in the evolution of banking. Ideally, contingency plans would be indicated in all instruments. When possible, authorizing instruments should indicate areas of potential problems and the actions that will be taken if the remedial measures are not implemented in a timely fashion. When deficiencies are identified, debiting should cease for that part of the bank, and if the bank is operating at a deficit debiting should cease for the entire bank. If a bank sponsor does not complete the necessary remedial actions within a reasonable amount of time, the Corps or another member of the MBRT should be able to direct the funds to another party to perform corrective actions. Additionally, once the remedial action has been implemented and the bank is once again functional, the monitoring frequency should be increased until the bank is back on track. Bank contingency plans are ineffective, however, if contingency funds are not accessible in the event of enforcement and the funds are not sufficient to cover remediation costs. In the end, however, the most effective component to ensuring that wetland mitigation banks are in compliance is for the lead regulatory agency to be itself adequately funded to undertake regular monitoring, site visits, and to pursue any instances of noncompliance though requiring remedial measures or invoking enforcement action.

[543] Virginia Department of Environmental Quality. Telephone Interview. 22 Jan. 2001.

[544] Army Corps of Engineers, Vicksburg district. Telephone Interview. 7 Nov. 2000.

## THE ROLE OF THE PUBLIC

The 1995 guidance states that the public should have the ability to review and comment on proposed wetland mitigation banks. When the Corps receives a complete banking prospectus, it "should" provide notification of the availability of the prospectus for a minimum 21-day public comment period.[545] Public involvement in the process of bank establishment may improve decisions on the appropriateness of the service area, types of wetland to be mitigated, and likelihood of the proposed mitigation providing lost wetland functions. However, while the federal agencies have allowed for this public participation role, the language in both policies makes clear that the regulatory agencies have discretion over whether or not there is public involvement. The role of the public in reviewing and commenting on proposed wetland mitigation banks and in-lieu-fee mitigation projects should be a required step in the MBRT process.

Public involvement in the wetland mitigation banking process is greatly hindered by the inaccessibility of information on proposed and approved banks. Many Corps district web sites list public notice information and the status of permit requests. Few, however, include detailed information on the mitigation banking or in-lieu-fee activities in their jurisdictions.[546] This lack

[545] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995. II. C. 5.

[546] The Charleston district provides a list of approved mitigation banks and links to some banking instruments, see <http://www.sac.usace.army.mil/permits/mitigate.html>. The Chicago district provides a list of available wetland mitigation banks on its web site as of November 2001, see < http://www.lrc.usace.army.mil/10-r/ofsitopt.pdf>. The Galveston district provides a list of approved banks through 1999, <http://www.swg.usace.army.mil/reg/mitigation.asp>. The New Orleans district provides very cursory information about "mitigation areas" in the district. The list does not indicate how current it is, not does it indicate whether the areas are mitigation banks or other forms of compensatory mitigation. See <http://www.mvn.usace.army.mil/ops/regulatory/activebanks.htm>. The Norfolk district provides a list of wetland mitigation banks as of August 2002, including the number of credits available. It also lists the proposed banks in the district, see <http:/

of transparency is of greater concern for other forms of compensatory mitigation, such as in-lieu-fee mitigation, umbrella banks, and on- or off-site project-specific mitigation. Detailed, useful information on compensatory mitigation projects is not maintained in a centralized or even locally available manner. Because the nature and location of compensatory mitigation can have serious implications for water resources regionally, the Corps and other involved regulatory agencies should strive to make information on compensatory wetland mitigation readily accessible to the public.

## IMPEDIMENTS TO BANKING

Interviews with state agency representatives from each of the 50 states revealed a host of perceived impediments to the establishment of wetland mitigation banks and banking programs. Among the impediments are: cost of real estate in the areas best suited for mitigation sites; poor state agency relations with the Corps; the time-consuming and complex process of designating and approving a mitigation bank; the challenge of creating a wetland program that functions independently and in conjunction with Corps activities; reaching consensus with other state and federal agencies on how to govern banking; competing uses of land; existing state laws (Louisiana, Maryland, and Massachusetts) that indirectly or directly discourage mitigation banking; public perception of banking; risk involved with creating and managing individual bank sites; understaffed programs for effective management of mitigation sites; service area size limiting sufficient demand; lack of political support; and the need for a better wetland assessment techniques.

Faced with a number of impediments to building effective mitigation programs, many individuals and states are seeking alternatives to on-site mitigation, wetland mitigation banking, and in-lieu-fee mitigation. In chapter VIII, we refer to these mitigation alternatives collectively as gray-area and ad hoc mitigation.

/www.nao.usace.army.mil/Regulatory/mitbanklist.html>. The Portland district provides a list of banks on their web sites. More detailed information may be available but was not accessible at the time of this study. *See* <http://www.nwp.usace.army.mil/op/g/regs/mit_bank.htm>. The St. Louis district provides a list of the approved mitigation banks in the district, see *<http://www.mvs.usace.army.mil/permits/Banks.htm#where>*. The Wilmington district provides a list of approved mitigation banks and links to other mitigation information, see <http://www.saw.usace.army.mil/wetlands/regtour.htm>.

## STREAM MITIGATION BANKING

Fifteen of the 219 approved wetland mitigation banks analyzed provide credit for impacts to streams.[547] The majority of these banks provide credits for a variety of wetland types. Three banks, however—Etowah River Stream Mitigation Bank, Georgia; Fox Creek Stream Mitigation Bank, Missouri; and Richland County Broad River Mitigation Bank, South Carolina —provide only credits for impacts to streams through stream restoration, riparian restoration, and riparian enhancement.[548] Fourteen of the banks providing stream mitigation credits specify the mitigation method employed. These banking instruments indicate that the banks will provide credits through the following restoration methods: nine provide mitigation through stream restoration, four stream preservation, two stream enhancement, one stream creation, six riparian restoration, two riparian preservation, and one riparian enhancement.[549]

Bank instruments that provide information on the linear feet of stream and riparian habitat available and information on the number of credits provided help to give a sense of the number of linear feet of stream or riparian habitat that banks provide per credit. All but one bank, the Fox Creek Stream Mitigation Bank in Missouri, which provides 70 linear feet of stream restoration per credit, provide between .24 and .44 linear feet of stream restoration per credit.[550] Stream preservation requires much higher linear feet per credit with a range of .77 to 1.26 linear feet per credit.[551] Banks provide between .28 and .40 linear feet per credit for ripar-

[547] Barra Farms Cape Fear Regional Mitigation Bank, North Carolina; Bluefield Ranch Mitigation Bank, Florida; Chattahoochee Mitigation Bank, Georgia; Cherry Creek Mitigation Bank, Georgia; East Central Florida Regional Mitigation Bank, Florida; Etowah River Mitigation Preserve, Georgia; Etowah River Stream Mitigation Bank, Georgia; Flat Swamp Wetland Mitigation and Stream Restoration Bank, North Carolina; Fort Stewart Wetland Mitigation Bank, Georgia; Fox Creek Stream Mitigation Bank, Missouri; James River Mitigation Landank, Virginia; Mulberry River Mitigation Bank, Georgia; Richland County Broad River Mitigation Bank, South Carolina; Shenandoah Wetland Bank, Virginia; and Trinity River Mitigation Bank, LTD, Texas.

[548] Etowah River Stream Mitigation Bank in Georgia provides credits through riparian restoration; Fox Creek Stream Mitigation Bank in Missouri provides credits through stream restoration and riparian enhancement; and Richland County Broad River Mitigation Bank in South Carolina provides credits through stream enhancement.

[549] Several banks will provide credits using more than one mitigation method.

[550] Only five banks provide this data.

[551] Only three banks provide this data.

[552] Only five banks provide this data.

ian restoration,[552] and riparian preservation requires between .88 and 1.06 linear feet per credit.[553]

Six of the 15 mitigation banks providing stream mitigation credits are located in the Savannah district of the Corps.[554] This is likely due to the fact that the Savannah Corps district has issued standard operating procedures to guide compensatory mitigation for impacts to both wetlands and streams.[555] The procedures apply to impacts to 10 acres or less of wetland or other open waters and 5,000 linear feet or less of intermittent and/or perennial stream.[556] Impacts greater than 0.1 acre of wetlands or more than 100 linear feet of stream must satisfy the requirements of the guidance.[557] The procedures state, "the stream restoration plan will include a vegetated buffer. In order to assure that these buffers serve the intended use in perpetuity, they must be protected by a conservation easement or a restrictive covenant."[558] The procedures also set forth a worksheet for assessing the number of credits available for stream and riparian restoration.[559]

[553] Only two banks provide this data.

[554] Chattahoochee Mitigation Bank, Cherry Creek Mitigation Bank, Etowah River Mitigation Preserve, Etowah River Stream Mitigation Bank, Fort Stewart Wetland Mitigation Bank, and Mulberry River Mitigation Bank.

[555] U.S. Army Corps of Engineers, Savannah district. *Standard Operating Procedure: Compensatory Mitigation Wetlands, Openwater, & Streams*. 2000. *See* < http://144.3.144.48/permit/sect1.rtf>.

[556] *Id*. at 1.

[557] *Id*. at 2.

[558] *Id*. at 4.

[559] *Id*. at Attachment D: Stream Mitigation Worksheets. *See* <http://144.3.144.48/permit/sect5.rtf>.

# V. UMBRELLA INSTRUMENTS AND MULTI-SITE BANKS

## UMBRELLA INSTRUMENT BASICS

Umbrella wetland mitigation bank instruments were first formally defined in the 1995 bank ing guidance.[560] Umbrella banks are sponsored by a single entity to establish and operate a regional banking program with multiple sites. The instruments establish the parameters of the banking program, and supplemental site-specific information (e.g., individual site plan information) is addressed in a separate document. Umbrella instruments may authorize one or several sites, but they also outline the requirements for the inclusion of future sites.

The majority of the umbrella instruments have been established since 1995. Of the 40 approved instruments, 30 were established between 1995 and 2002. Nine of the umbrella instruments were established before 1995 (the first being in 1988[561]). There is one umbrella bank for which the date of establishment was unavailable.[562]

## GENERAL INFORMATION: NUMBERS, ACRES, SITES

There are currently 40 approved umbrella instruments in the United States, three pending instruments, and one approved but inactive umbrella instrument. Under the 40 approved umbrella instruments, approximately 26,848 acres of mitigation wetlands have been approved at 308 individual mitigation sites across the country. Twenty-three states in the country have one or more umbrella instruments (see Appendix G). There are approximately 1/5 as many approved umbrella instruments as there are approved wetland mitigation banks. The acreage approved under umbrella instruments represents about 1/5 as much acreage as the total number of acres approved under individual wetland mitigation banks.

## BANK SITING

Because individual bank sites are generally not specified in umbrella banking instruments, the process that is outlined in the instruments to select bank sites is important. Most umbrella instruments specify a list of criteria that proposed sites must address in the site-specific plan when a new site is proposed. Some of these criteria include:

- Wetland functions and values most needed in the geographic service area;
- Potential to link corridors or smaller areas into larger consolidated wetlands;
- Adjacency to other public lands;
- Riparian restoration; and
- Potential to assist in achieving wildlife improvements, higher water quality, aesthetic and educational attributes.

For example, several of Virginia's umbrella instruments state that a goal of the banking program is to preserve sensitive lands at risk by saving "premier natural areas of Virginia wet wilderness in view of the likelihood of §404-exempt silvicultural operations, and other activities which are not subject to wetlands regulations and which might adversely impact wetlands."[563]

### Site approval

In most cases, an MBRT is responsible for reviewing site-specific plans and approving, modifying, or re-

[560] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks.* 60 *Fed. Reg.* 228. 58605-58614. 1995.

[561] South Dakota Department of Transportation. *Memorandum of Understanding Among Federal Highway Administration, South Dakota Department of Transportation, South Dakota Department of Game, Fish and Parks, U.S. Fish and Wildlife Service*. MOU. SD, 1988.

[562] Mississippi Band of Choctaw Indians, Phillip Martin, Tribal Chief. *Mississippi Band of Choctaw Indians Mitigation Banking Program Agreement.* Banking Agreement. MS.

[563] Davis Wetland Bank, L.L.C. *Umbrella Memorandum of Agreement Between Bank Sponsor, U.S. Army Corps of Engineers, et al., to Establish a Procedure for Compensation for Wetland Habitat Losses in Southeastern Virginia in the Davis Wetland Bank, L.L.C. and for the Development and Use of Such Bank, November 4, 1998.* MOA. VA, 1998; Hampton Roads Airport Mitigation Bank, L.L.C. *Umbrella Memorandum of Agreement Between Bank Sponsor, U.S. Army Corps of Engineers, et al., to Establish a Procedure for Compensation for Wetland Habitat Losses in the Hampton Roads Airport Mitigation Bank, L.L.C. and for the Development and Use of Such Bank, July 26, 2000.* MOA. VA, 2000.

**SITE APPROVAL UNDER THE ARKANSAS UMBRELLA PROGRAM**

The state-sponsored umbrella bank in Arkansas has a particularly thorough description of the requirements for site approval.[564] In order for each site to be approved a supplemental bank instrument (SBI) must be prepared. Each SBI must include the following:

1. Bank site goals and objectives
2. Location map
3. Baseline conditions: a) bank acreage; b) composition, number of acres of wetlands, uplands, prior converted cropland/farmland wetland, etc.; c) baseline assessment of wetland functions and values; d) wetland delineation of bank site, including description of soils, vegetation, hydrology; e) hydrologic zones
4. Development Plan: a) specific plans for development of wetland; b) planting plans, map, species; c) hydrologic restoration; d) enhancements; e) construction schedule; f) reporting/monitoring plans; g) contingencies and remedial action; h) deed restriction or conservation easement; i) plan for long-term mgmt and maintenance; j) bank record keeping

jecting proposed plans. The Corps provides overall site selection oversight. In most cases, the following elements must be addressed to some degree of detail in the site-specific plan or supplemental banking instrument:

- Bank site goals and objectives
- Location map
- Delineation of jurisdictional waters
- Baseline conditions
- Development plan

### Corps involvement

The Corps is a signatory and involved with bank oversight for the majority of the nation's umbrella instruments. Of the 40 approved umbrella instruments, the Corps provides oversight of site approval to 35 programs. Only five umbrella instruments in the country operate without Corps oversight: South Dakota, Pierce County, King County, Wayne County, and Wyoming Statewide Bank.[565] Corps involvement in the approval and oversight of individual mitigation sites under umbrella instruments is similar to the role played in traditional wetland mitigation banks, although it may differ. The role of the Corps—as well as the role of the MBRT— with umbrella instruments involves considerable discussion of site selection, and approval and guidance during the construction and debiting phases after the initial approval of the overall umbrella banking instrument.

Some states, most notably Minnesota and Wisconsin, have extensive mitigation banking programs authorized under umbrella instruments that pre-date the 1995 banking guidance. To a large extent, the programs in these states evolved independent of Corps oversight. Over the years, the Corps has become more involved, but banking programs in these states remain somewhat autonomous compared to programs in other states. Beyond Minnesota and Wisconsin, there are other states where the Corps' role in overseeing umbrella and mitigation banking programs is more limited. Nevertheless, limited involvement in certain states does not indicate a trend of less Corps involvement in the management of umbrella agreements.

## AGREEMENT TYPE/SPONSOR TYPE

Of the 40 approved umbrella instruments, 18 are single-user umbrella banks, where the bank sponsor is the only client of the bank. Of these 18 single-user agreements, 13 are sponsored by state departments of transportation. Private corporations sponsor ten private commercial umbrella instruments. Nine of the umbrella instruments are classified as public commercial with public agencies as sponsors. For instance, several banks are sponsored by counties, cities, or other local government entities. Two of the umbrella instruments are sponsored by non-profit organizations and are classified as private non-profit. Only one agreement is a combination public-private, in which case the sponsor is both a public organization and a private corporation.

## WHY ADOPT AN UMBRELLA APPROACH?

For many parties, the process of establishing an umbrella instrument proves to be much more efficient than that of establishing individual wetland mitigation banks or in-lieu-fee arrangements. Upon approval of the umbrella instrument by an MBRT, sites can be proposed with information in a site-specific plan. For states or sponsors that anticipate the need for several banks in the coming years, creating an umbrella instrument can be an attractive option. Umbrella arrangements allow for a single umbrella banking instrument to be devel-

[564] Arkansas Soil and Water Conservation Commission. *Umbrella Memorandum of Agreement for the Establishment, Development, and Operation of an Arkansas State-Sponsored Wetlands Mitigation Bank Program.* MOA. AR, 1998.

[565] Authorizing instruments and personal communication with bank sponsors. It should be noted that the Corps is indirectly involved with some aspects of these banks, and may still issue the permits, or occasionally attend meetings regarding the operation and management.

oped and approved while leaving open the flexibility of creating several sites at a future date. One weakness of umbrella agreements is that they have the potential to be an ever-expanding and presumably less supervised system of mitigation banking.[566] Sponsor agencies sometimes do not have adequate staff to accommodate increased work from the addition of multiple individual sites. This can compromise the sponsor's ability to effectively design, monitor, and enforce additional sites as they are approved under the umbrella agreement.

[566] Wisconsin Department of Natural Resources. Telephone interview. 14 Feb. 2001.

# VI. ORGANIZATION OF IN-LIEU-FEE MITIGATION PROGRAMS

## BACKGROUND

An **in-lieu-fee program** is an agreement between a regulatory agency (state, federal, or local) and a single sponsor, generally a public agency or non-profit organization. Under an in-lieu-fee agreement, the mitigation sponsor collects funds from an individual or a number of individuals who are required to conduct compensatory mitigation required under §404 or another state or local wetland regulatory program. The sponsor may use the funds pooled from multiple permittees to create one or a number of sites under the authority of the agreement to satisfy the permittees' required mitigation. In-lieu-fee mitigation is generally categorized as mitigation conducted after permitted impacts have occurred.

The Corps began allowing permittees to pay funds in-lieu of conducting on-site, permittee-responsible mitigation in the late 1980s. These early transactions were primarily approved in unusual circumstances on a one-time, project-by-project basis as part of an agreement between the permittee and the regulatory entity. These in-lieu-fee transactions were not usually carefully documented. The regulatory entities viewed in-lieu-fee payments as a flexible option for meeting mitigation requirements. The use of in-lieu-fee payments slowly increased through the early 1990s. These one-time transactions began to develop into more systematic programs, although they still retained a high degree of flexibility.

New Jersey's state in-lieu-fee mitigation program, authorized in 1987, is one of the earliest such programs.[568] The first in-lieu-fee programs developed in the absence of federal guidance to regulate their operation. These programs typically did not involve detailed agreements, lacked a governing framework, and varied greatly between programs. In-lieu-fee programs were

> *"'In-lieu-fee mitigation occurs in circumstances where a permittee provides funds to an in-lieu-fee sponsor instead of either completing project-specific mitigation or purchasing credits from a wetland mitigation bank approved under the Banking Guidance."*[567]

first characterized by the federal government in the 1995 banking guidance, although only in a cursory manner. The 1995 guidance states that in-lieu-fee mitigation does not meet the definition of mitigation banking because it does not "typically provide compensatory mitigation in advance of project impacts."[569] The guidance also states that the Corps may find circumstance where in-lieu-fee arrangements are appropriate as long as they meet the requirements that would otherwise apply to an off-site mitigation effort and they provide adequate assurances of ecological effectiveness and timely implementation.[570] This vague language allowed in-lieu-fee programs to continue to evolve in the absence of any detailed requirements.

In response to concerns about the ability of in-lieu-fee programs to provide ecologically effective compensatory mitigation, the Corps, USEPA, FWS, and NOAA promulgated guidance on in-lieu-fee mitigation in 2000 ("2000 guidance" or "in-lieu-fee guidance").[571] The guidance was designed to address concerns about whether fees collected under these programs were being spent and mitigation was being completed in a timely manner and whether the Corps or the state regulatory agency were conducting adequate monitoring and oversight of the projects.[572]

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[567] U.S. Department of the Army, U.S. Environmental Protection Agency, U.S. Department of Interior, and U.S. Department of Commerce. *Federal Guidance on the Use of In-Lieu-Fee Arrangements for Compensatory Mitigation under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.* 2000.

[568] Royal Gardner. *Money for Nothing? The Rise of Wetland Fee Mitigation.* 19 Va. Envtl. L.J. 1, 2000.

[569] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks.* 60 Fed. Reg. 228, 58605-58614. 1995. II.F (1).

[570] *Id.*

[571] U.S. Department of the Army, U.S. Environmental Protection Agency, U.S. Department of Interior, and U.S. Department of Commerce. *Federal Guidance on the Use of In-Lieu-Fee Arrangements for Compensatory Mitigation under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.* 2000. 66915.

[572] United States General Accounting Office. *Wetlands Protection: Assessments Needed to Determine Effectiveness of In-Lieu Fee Mitigation.* GAO-01-325. May 4, 2001.

The 2000 guidance states that MBRTs should review applications from in-lieu-fee sponsors to ensure that agreements are consistent with the 1995 banking guidance.[573] It also states a preference for the use of mitigation banks over the use of in-lieu-fee programs when on-site mitigation is not available or is less "environmentally desirable" and "the permitted impacts are within the service area of a mitigation bank approved to sell mitigation credits," or if the service area for both the in-lieu-fee program and the mitigation bank are outside of the watershed of the permitted impact.[574] Preference is not given to a mitigation bank over in-lieu-fee mitigation when the mitigation bank does not provide in-kind mitigation and the in-lieu-fee site does, or if the bank only provides preservation credits, rather than credits generated through restoration, creation, or enhancement, and the in-lieu-fee site provides credits generated through in-kind restoration.[575]

In-lieu-fee programs that were established following issuance of the 2000 guidance rely on very different agreements than their predecessors. These new agreements, such as the two South Carolina programs, Beidler Forest and Historic Ricefields, are more detailed and more similar to banking instruments than previous agreements.[576] These agreements include detailed performance criteria, specific long-term management and maintenance requirements, and outline the role of the MBRT. The 2000 guidance has also caused several in-lieu-fee program administrators to reexamine their programs. Several in-lieu-fee programs have ceased activity altogether, some have stopped accepting payments in-lieu of mitigation until their programs are reauthorized under an updated agreement, and others are continuing to operate while updating their agreements to be consistent with the guidance.

The 2000 in-lieu-fee guidance applies only to those programs that accept payment for impacts approved under the §404 program, a subset—albeit, the majority—of the currently approved in-lieu-fee programs. In-lieu-fee programs that accept payment for impacts approved under a state or local wetland regulatory program are not required to adhere to directives issued by federal agencies.

## IN-LIEU-FEE BASICS

### Roles and responsibilities

When establishing an in-lieu-fee agreement, the **regulatory agency**—the Corps, state, and/or local governmental agency—may, with other federal agencies, sign an agreement with a third party (the program sponsor) to establish the framework for the third party to accept funds from a permittee in order to satisfy the permittee's compensatory mitigation requirements. The regulatory agency then oversees the in-lieu-fee program and the required mitigation.

Under an in-lieu-fee agreement, the **program sponsor**, often a state agency, land trust, or conservation organization, agrees to complete mitigation projects to satisfy the mitigation requirements created by the permittee's impacts. The program sponsor may accumulate funds in-lieu of mitigation from multiple permittees to implement mitigation projects. According to the 2000 in-lieu-fee guidance, the Corps should evaluate the demonstrated performance of natural resource management agencies or organizations prior to approving them to manage an in-lieu-fee program.[577] In advance of establishing an in-lieu-fee program, the program sponsors should provide the Corps with information on potential sites where projects are planned, "the schedule for implementation, the type of mitigation that is most ecologically appropriate for a particular parcel, and the financial, technical, and legal mechanisms to ensure long-term mitigation success."[578] The 2000 guidance also states that the agreements should "clearly state that the legal responsibility for ensuring mitigation terms are satisfied fully rests with the organization accepting the in-lieu-fee."[579]

The **permittee** is the entity or entities whose activities will create a permitted wetland impact for which mitigation is being sought. The permittee must, in-lieu of conducting permittee-responsible mitigation or purchasing credits from a wetland mitigation bank, pay a fee, dictated by the in-lieu-fee provider, to satisfy compensatory mitigation requirements. After paying the

[573] U.S. Department of the Army, U.S. Environmental Protection Agency, U.S. Department of Interior, and U.S. Department of Commerce. *Federal Guidance on the Use of In-Lieu-Fee Arrangements for Compensatory Mitigation under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act*. 2000. 66915.

[574] *Id.*

[575] *Id.*

[576] National Audubon Society. *Beidler Forest In-Lieu Fee Mitigation Program Implementation Instrument*. SC. 2000; Historic Ricefields Association. *Historic Ricefields Association Waccamaw and Pee Dee River Basins In-Lieu Fee Mitigation Program Implementation Instrument*. SC. 2000.

[577] U.S. Department of the Army, U.S. Environmental Protection Agency, U.S. Department of Interior, and U.S. Department of Commerce. *Federal Guidance on the Use of In-Lieu-Fee Arrangements for Compensatory Mitigation under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act*. 2000. 66916.

[578] *Id.*

[579] *Id.*

required fees, the permittee is absolved of any mitigation obligations or liability should the mitigation fail.

## IN-LIEU-FEE AGREEMENTS

According to the 2000 guidance, a formal in-lieu-fee agreement should be established by the sponsor with the Corps, and it may be appropriate to establish an "umbrella" agreement for the establishment and operation of multiple sites.[580] The in-lieu-fee agreement should include:

- A description of the sponsor's qualifications;
- Potential site locations, baseline conditions at the sites, and general plans that indicate what kind of wetland compensation can be provided;
- Geographic service area;
- Accounting procedures;
- Methods for determining fees and credits; a schedule for compensation activities;
- Performance standards;
- Reporting and monitoring plans;
- Financial, technical, and legal provisions for remedial actions;
- Financial, technical, and legal provisions for long-term management; and
- A provision that clearly places legal responsibility for the mitigation on the sponsor.[581]

## TYPES OF IN-LIEU-FEE PROGRAMS

In-lieu-fee mitigation programs generally fall into one of three categories based on the regulatory entity overseeing the program: Corps-administered programs, state-administered programs, or locally administered programs. Corps-administered programs are in-lieu-fee programs that are approved by and administered by the Corps. The Corps enters into an agreement with an in-lieu-fee sponsor to collect funds and undertake mitigation projects. These programs were the focus of a 2001 report by the GAO.[582]

State-administered programs are in-lieu-fee programs that are administered primarily by a state agency. The Corps often approves state-sponsored programs. Some of these programs, however, may accept payments for impacts regulated under a state wetland program, rather than under the §404 program, in which case, the Corps is not involved.

Locally administered in-lieu-fee programs are those that are administered primarily by a local entity, such as a county government. These programs may have Corps approval. Many of these programs, however, accept payment for impacts that are regulated under a local wetland ordinance but are not regulated under §404. In these cases, the Corps may play no role in the program.

## THE STATE REGULATORY CONTEXT FOR IN-LIEU-FEE MITIGATION

In addition to the federal guidelines developed to govern the creation of in-lieu-fee programs, some states have developed their own statutes, regulations, or guidelines to supplement the federal requirements for in-lieu-fee programs. Nine states have authorized statutes and/or regulations that address the establishment of in-lieu-fee programs.[583] Specifically, three states, Florida, New Jersey, and North Carolina, have statutes and regulations that address in-lieu-fee programs. Four states, Louisiana, Maryland, Oregon, and Pennsylvania, just have regulations, and two states, Maine and Virginia, just have statutes.

Three states, Arizona, Colorado, and South Carolina, have chosen to issue guidelines regarding in-lieu-fee programs, rather than formally promulgate statutes and regulations. Maryland has issued guidelines in addition to its regulation addressing in-lieu-fee programs, and Pennsylvania and Virginia have also issued guidelines in addition to their state statutes addressing in-lieu-fee programs.

Clallam County, Washington and DuPage County, Illinois, where county in-lieu-fee programs exist, have issued ordinances establishing these county programs. Sacramento County, California, which also administers a county in-lieu-fee program, chose to issue a resolution from the board of supervisors to establish the in-lieu-fee program.

In addition to state and federal authorities governing the establishment of in-lieu-fee programs, at least one nonprofit organization, The Nature Conservancy, has developed internal guidelines to govern its establishment and administration of wetland mitigation sites, including in-lieu-fee sites.[584] These guidelines obviously cannot supplant the federal and state authorities, but instead are meant to ensure that the group's projects further the conservation objectives of the organization.

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[580] *Id.* at 66917.

[581] *Id.*

[582] United States General Accounting Office. *Wetlands Protection: Assessments Needed to Determine Effectiveness of In-Lieu Fee Mitigation.* GAO-01-325. May 4, 2001.

[583] Florida, Louisiana, Maine, Maryland, New Jersey, North Carolina, Oregon, Pennsylvania, and Virginia.

[584] The Nature Conservancy. *Standards and Guidelines for Compensatory Mitigation Projects of The Nature Conservancy*. 10 Jan. 2002.

# VII. THE STATUS OF IN-LIEU-FEE MITIGATION

## NUMBER OF PROGRAMS

There are currently 87 active in-lieu-fee programs in the United States.[585] The active programs are located across the country in 27 states.[586] Some states have both state-administered and Corps-administered programs, as is the case in Louisiana and Florida. Ohio and Louisiana have the greatest number of active in-lieu-fee programs with 25 and 18 respectively. Some of the in-lieu-fee programs operate in more than one state. For example, the Delta Environmental Land Trust Association in-lieu-fee program in the Vicksburg district operates in Louisiana, Arkansas, and Mississippi. There are also currently six pending in-lieu-fee programs: one in Idaho, two in Maine, and three in Texas.

The state programs in Maryland, Oregon, and Pennsylvania have been particularly active. The Maryland program has completed 30 in-lieu-fee sites, has four sites under construction, and three sites pending approval. The Oregon program has completed 21 in-lieu-fee sites and has seven sites pending approval. The Pennsylvania program has completed 30 in-lieu-fee sites since its inception.

Of the 87 active in-lieu-fee programs, 72 are administered by the Corps. These Corps-administered programs are located in the Alaska, Buffalo, Chicago, Fort Worth, Galveston, Huntington, Jacksonville, Kansas City, Little Rock, Los Angeles, Louisville, Memphis, New Orleans, Norfolk, Sacramento, Savannah, St. Louis, Vicksburg, and Walla Walla districts.[587] Several of the Corps-administered programs accept payment for permitted impacts that occur in more than one state.[588]

Twelve of the 87 programs are administered by state agencies. The state-administered programs are located in Arizona, Florida, Louisiana, Maryland, New Jersey,

**DEFINITIONS**

For the purposes of this study, the following definitions are employed:

- **In-lieu-fee program—**An agreement between a regulatory agency (state, federal, or local) and a single sponsor, generally a public agency or non-profit organization, whereby the sponsor collects funds from wetland permittees to undertake compensatory mitigation required under §404 or another state or local wetland regulatory program. Often, the sponsor may create multiple sites under the authority of their agreement. In-lieu-fee mitigation is generally categorized as mitigation conducted after the permitted impacts.
- **Active in-lieu-fee program**—An agreement between a regulatory entity and a sponsor that has been approved by the parties to collect funds and provide compensatory mitigation. The sponsor may not yet have collected funds but is approved to do so.
- **Pending in-lieu-fee program**—A proposed agreement between a regulatory entity and sponsor that has not yet been approved by the regulatory agency to collect funds and conduct mitigation.
- **Completed in-lieu-fee sites**—Mitigation sites where construction has been completed, though the site may still be under monitoring requirements.
- **Construction in-lieu-fee sites**—Mitigation sites where construction has been started on the site but is not yet completed.
- **Pending in-lieu-fee sites**—Mitigation sites that have been proposed but are not yet approved.

[585] Alaska (4), Arizona (1), California (7), Florida (4), Georgia (1), Idaho (2), Illinois (2), Kentucky (2), Louisiana (18), Maryland (1), Missouri (4), New Jersey (1), New York (4), North Carolina (1), Ohio (25), Oregon (1), Pennsylvania (1), South Carolina (2), Texas (4), Virginia (1), and Washington (1). Data on in-lieu-fee mitigation provided in this study is current through December 2001.

[586] Alaska, Arizona, Arkansas, California, Colorado, Florida, Georgia, Idaho, Illinois, Kentucky, Louisiana, Maryland, Mississippi, Missouri, Nevada, New Jersey, New Mexico, New York, North Carolina, Ohio, Oregon, Pennsylvania, South Carolina, Texas, Utah, Virginia, and Washington.

[587] Alaska (4), Buffalo (27), Chicago (1), Fort Worth (1), Galveston (3), Huntington (2), Jacksonville (1), Kansas City (1), Little Rock (1), Los Angeles (5), Louisville (2), Memphis (1), New Orleans (16), Norfolk (1), Sacramento (1), Savannah (1), St. Louis (1), Vicksburg (1), and Walla Walla (2).

[588] Delta Environmental Land Trust Association. *Delta Mitigation Banking Program Agreement.* AR, LA, and MS. 1994; Missouri Conservation Heritage Foundation Program in the Little Rock district. MO and MS. 2000; Missouri Conservation Heritage Foundation Program in the Memphis district. MO and MS; The National Fish and Wildlife Foundation. *Letter of Agreement between the U.S. Army Corps of Engineers, South Pacific Division and the National Fish and Wildlife Foundation Concerning the Establishment and Operation of the South Pacific Wetlands Conservation Account.* AZ, CA, CO, NM, NV, TX, and UT. 2000; The Nature Conservancy. *Agreement Between The Nature Conservancy and the Regulatory Branch, U.S. Army Corps of Engineers, Sacramento District to Establish a Fee-Based Compensatory Mitigation Program Under Section 404 of the Clean Water Act.* CA, CO, NV, and UT. 2000.

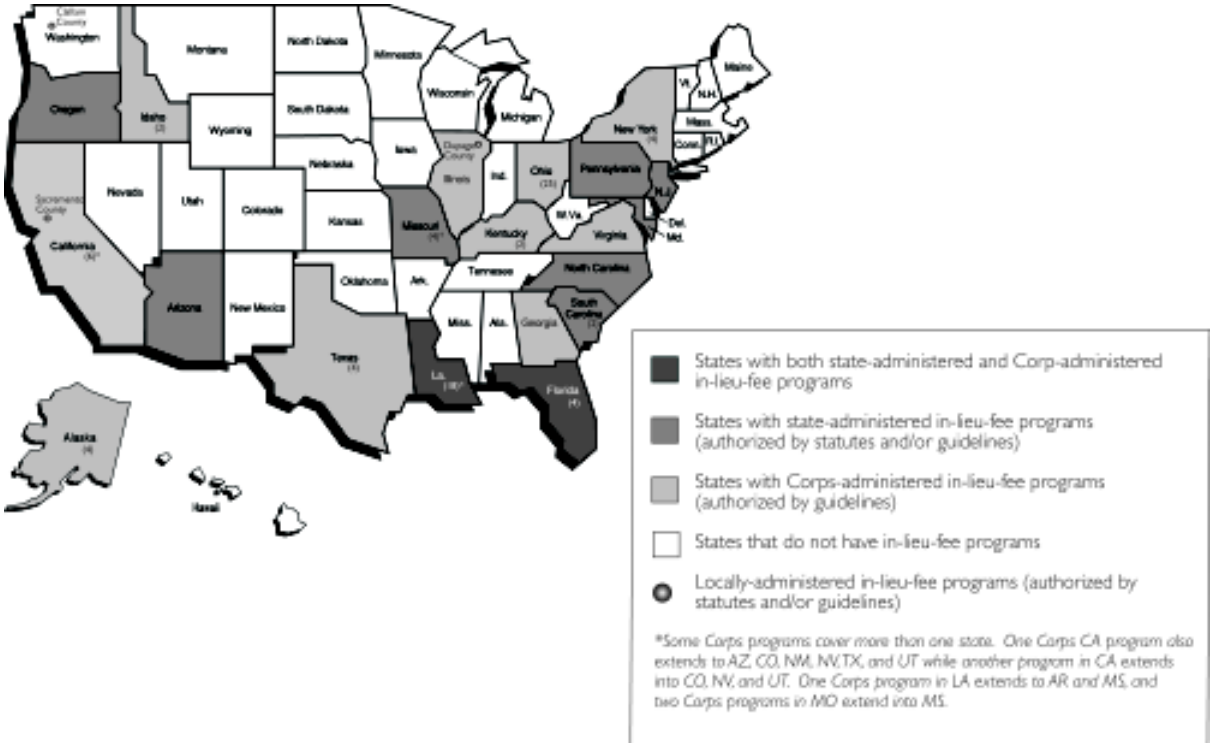


**FIGURE 8.** States with Corps-administered and state-administered in-lieu-fee programs.

North Carolina, Oregon, Pennsylvania, and South Carolina.[589] Florida and South Carolina are the only states that operate more than one in-lieu-fee program, with Florida operating three and South Carolina operating two programs.

Three of the 87 programs are locally administered. The local programs are located in Sacramento County, California; DuPage County, Illinois; and Clallum County, Washington. The Sacramento and DuPage county programs were specifically created to accept payment for impacts that would otherwise not require mitigation under a Corps §404 permit. Several other localities have passed ordinances that allow for the creation of an in-lieu-fee program, but these programs have not yet been established. For example, ordinances in Boulder, Colorado and in Lake County, Illinois authorize the use of an in-lieu-fee program but none yet exist.

## TRACKING IN-LIEU-FEE ACTIVITY

The 2000 in-lieu-fee guidance states that program sponsors should submit annual reports to the regulatory agency overseeing the program to "document funds received, impacts permitted, how funds were disbursed, types of projects funded, and the success of projects conducted under the in-lieu-fee" agreements.[590] In addition, the guidance states that the Corps should "track all uses of in-lieu-fee arrangements and report the figures by public notice on an annual basis."[591] The regulatory entity should track the location and amount of the permitted impact, required mitigation, funds collected, size and mitigation type of the in-lieu-fee sites, and whether or not sites have met performance criteria or functional equivalency with reference sites. Without this information the regulatory entity cannot ensure that the collected funds are being spent in an appropriate manner and that the required mitigation is being successfully undertaken.

Many in-lieu-fee administrators do not systematically track the use of the collected funds in their in-lieu-fee programs, and very few provide this data by public notice on an annual basis. Many of the in-lieu-fee programs seem to be in transition from ad-hoc programs to more formal programs. For example, no records were maintained for the Singer Lake Bog[592] and Ohio Wet-

[589] Arizona (1), Florida (3), Louisiana (1), Maryland (1), New Jersey (1), North Carolina (1), Oregon (1), Pennsylvania (1), and South Carolina (2).

[590] U.S. Department of the Army, U.S. Environmental Protection Agency, U.S. Department of Interior, and U.S. Department of Commerce. *Federal Guidance on the Use of In-Lieu-Fee Arrangements for Compensatory Mitigation under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.* 2000. 66916-66917.

[591] *Id.* at 66917.

[592] Cleveland Museum of Natural History. *Singer Lake Bog In Lieu Fee Mitigation Arrangement Between the U.S. Army Corps of Engineers, Huntington District and the Cleveland Museum of Natural History*. OH. 1999.

lands Corporation[593] in-lieu-fee programs in Ohio, though both of these programs have formal in-lieu-fee agreements with sponsoring agencies.

Tracking data on in-lieu-fee funds is unavailable or incomplete for 39 (or 45 percent) of the nation's in-lieu-fee programs.[594] Most of the programs that do not maintain complete records are Corps-administered programs. For example, the New Orleans district does not track any funding information for its 16 programs, and the Vicksburg district does not track the location or size of permitted impacts for its in-lieu-fee program. Adequate information also was unavailable for the 27 programs in the Buffalo district. In addition, communication between state regulatory agencies, Corps district offices, and local regulatory programs on the existence and activity of in-lieu-fee programs is inconsistent at best. The state wetland regulatory agencies in some states, such as Nevada and Mississippi, were unaware that the geographic scope of the Corps-sponsored in-lieu-fee programs included their states.[595] Additionally, some Corps districts are unaware that state and local in-lieu-fee programs operate in their districts.[596]

## STATUS OF PROGRAMS

### Impacts vs. returns

For in-lieu-fee programs to contribute to the national goal of no net loss of wetlands acreage (functions aside), the acreage of wetlands that are restored, enhanced, created, or preserved by the in-lieu-fee programs should equal or exceed the acreage of wetlands impacted. For the majority of in-lieu-fee programs, information was unavailable to compare the acreage or linear feet of impacts to the size of the mitigation projects to determine if the mitigation projects were meeting or exceeding the size of the permitted impacts.

Due to incomplete tracking of information by in-lieu-fee administrators, 15 programs were not able to provide information on the number of acres of wetlands impacted that generated the in-lieu fees.[597] Information was also not available on the wetland acreage that was restored, created, enhanced, or preserved with the collected fees in seven in-lieu-fee programs.[598] In addition, some Corps districts lumped the data for multiple programs in their district into one calculation. Therefore individual information for 49 programs was not available.[599]

Fifty-six of the 87 in-lieu-fee programs (including a substantial number that aggregated program statistics for multiple programs in the same Corps district) reported replacing more acres than had been impacted.[600] Although Oregon's state in-lieu-fee program has replaced more wetland acres than have been impacted, the program has not replaced enough linear feet of stream to meet a goal of a 1:1 ratio of stream feet impacted to stream feet mitigated. Thirteen in-lieu-fee programs reported replacing fewer acres than had been impacted.[601]

North Carolina's in-lieu-fee program—a state sponsored effort—has generated considerable attention. The North Carolina program has completed 11 projects, has started construction on nine projects, and has another

[593] Ohio Wetlands Corporation. *Wetland Mitigation In-Lieu Fee Agreement.* OH. 1998

[594] Alaska (4), California (6), Florida (1), Idaho (2), Kentucky (2), Louisiana (17), Ohio (2), Texas (4), and Washington (1).

[595] Nevada Division of Environmental Protection. Telephone Interview. 7 Mar. 2001; Mississippi Department of Natural Resources. Telephone Interview. 7 Mar. 2001.

[596] United States Army Corps of Engineers, Sacramento district. Telephone Interview. 28 Dec. 2001.

[597] Alaska – Kachemak Heritage Land Trust In-Lieu-Fee Program, The Conservation Fund In-Lieu-Fee Program, and Southeast Alaska Land Trust In-Lieu-Fee Program; California- Ventura River Watershed Program, Santa Margarita Arundo Control Fund Program, and the Los Angeles County Aquatic Resource Program; Florida – Audubon of Florida Program; Kentucky – Northern Kentucky University Program; Louisiana – Delta Environmental Land Trust Association Program; Ohio – Singer Lake Bog Program and Somerford Township Program; and Texas – The Nature Conservancy and Fort Worth district In-Lieu-Fee Program, The National Fish and Wildlife Foundation Program, Texas Parks and Wildlife Department Program, and the Katy Prairie Conservancy In-Lieu-Fee Program. (The Kachemak Heritage Land Trust Program and the Ventura River Watershed program reported that they had collected money due to impacts, but the size of the impacts was not available.)

[598] Alaska - Kachemak Heritage Land Trust Program, The Conservation Fund Program, and Southeast Alaska Land Trust Program; California – the Los Angeles County Aquatic Resource Program; Florida - Audubon of Florida Program; Kentucky – Northern Kentucky University Program; and Louisiana – Delta Environmental Land Trust Association Program.

[599] Idaho (2), Louisiana (16), Missouri (4), New York (4), and Ohio (23).

[600] California (2), Florida (2), Georgia (1), Idaho (2), Illinois (1), Louisiana (16), Maryland (1), New Jersey (1), New York (4), Ohio (23), Pennsylvania (1), Virginia (1), and Washington (1).

[601] Alaska – Great Land Trust Program and Kachemak Heritage Land Trust Program; Arizona – Arizona Game and Fish Department Program; California – Sacramento County Program and the Ventura River Watershed Program; Florida – Florida Department of Transportation Program; Illinois – DuPage County Program; Louisiana – Wetlands Conservation and Restoration Fund; Missouri – Missouri Conservation Heritage Foundation Programs (4); and North Carolina – Wetlands Restoration Program.

40 projects pending approval. To date, the program has collected about $58 million but has yet to complete enough projects to replace all of the permitted losses. However, the MOU between the Wilmington district and the North Carolina state agency that authorizes the program currently allows the state agency 12 months from the date of payment to identify and acquire a site and another 24 months to complete construction of the site; thus, the required mitigation projects may still be completed within the specified timeframe. Some of the controversy surrounding this program stems from the fact that the state in-lieu-fee program may be in competition with active wetland mitigation banks in the state.

### Funding

Fifty-six (or 64 percent) of the nation's in-lieu-fee programs were able to provide adequate information on the amount of funds they had collected since the inception of their programs.[602] These amounts varied greatly, depending on the length of the program's existence, active use of the program, and amount of in-lieu fees charged. Four in-lieu-fee programs have been approved but have not yet received any funding.[603]

## IMPACT LIMITS

Some in-lieu-fee programs were developed to provide compensatory mitigation for minor impacts primarily authorized under Corps general permits. The Corps often does not require compensatory mitigation for minor impacts because it has determined that there are no feasible project-specific mitigation options available.[604] In addition, according to a report by the Institute for Water Resources, research has demonstrated that on-site mitigation for relatively minor impacts has a high failure rate.[605] Some in-lieu-fee programs were developed to address this loophole in the compensatory mitigation program. Although replacing small impacts with larger, off-site mitigation areas may not provide the same wetland functions, there are clear benefits to programs that require mitigation when none might otherwise be required.

Five in-lieu-fee programs accept payment in-lieu of mitigation only for impacts of one acre or less.[606] Two programs—the Calleguas Creek program in California and the state program in Pennsylvania—accept payment in-lieu of mitigation only for impacts of one-half an acre or less, and the program in Sacramento County, California only accepts payment for impacts to less than one-third of an acre.[607] The Audubon in-lieu-fee program in Key West, Florida only accepts payment for small impacts measured in square feet, rather than in acreage. The DuPage County, Illinois in-lieu-fee program limits participation to permitted impacts that are below Corps requirements for mitigation.[608] In addition, the in-lieu-fee program in the Fort Worth district limits its program to "minor" impacts, a term that is not well defined.[609] The Louisiana's state program only accepts payment for permitted impacts of less than 10 acres.[610] Municipalities in Maine have expressed interest in establishing an in-lieu-fee program, since many feel that the Corps threshold for requiring a §404 permit is too high and, therefore, many wetland impacts occur without requiring mitigation.

## ACCOUNTABILITY

Concern has been expressed about whether in-lieu-fee programs provide sufficient assurances and accountability for the ecological effectiveness of mitigation and whether the programs provide full compensation for permitted impacts.[611] These concerns can be addressed

[602] Alaska (2), Arizona (1), California (5), Florida (4), Georgia (1), Idaho (2), Illinois (2), Louisiana (1), Missouri (4), New Jersey (1), New York (4), Ohio (25), Oregon (1), Pennsylvania (1), Texas (1), and Virginia (1).

[603] California – South Pacific Wetlands Conservation Account; Kentucky – Louisville and Jefferson County Metropolitan Sewer District Program; and South Carolina – Beidler Forest Program and Historic Ricefields Program.

[604] Scodari and Shabman. *Review and Analysis of In Lieu Fee Mitigation in the CWA Section 404 Permit Program.* Alexandria, VA: Institute for Water Resources, U.S. Army Corps of Engineers, November 2000. 7.

[605] *Id.*

[606] California (3), Maryland (1), and Oregon (1).

[607] California Coastal Conservancy. *Agreement for Establishment and Administration of the Calleguas Creek Watershed (Ventura County, California) Aquatic Resource In-Lieu Fee Compensatory Mitigation Program Between the U.S. Army Corps of Engineers, Los Angeles District and the California Coastal Conservancy, CA.,* Pennsylvania Wetlands Replacement Project Guidelines, and Resolution of the Board of Supervisors of the County of Sacramento, California.

[608] DuPage County Countywide Stormwater and Flood Plain Ordinance §15-136.

[609] The Nature Conservancy. Agreement Between the Nature Conservancy and the U.S. Army Corps of Engineers, Fort Worth District to Establish an In-Lieu Fee Program in the Fort Worth District. TX.

[610] La. Admin. Code tit. 43, §724.I.

[611] Scodari and Shabman. *Review and Analysis of In Lieu Fee Mitigation in the CWA Section 404 Permit Program.* Alexandria, VA: Institute for Water Resources, U.S. Army Corps of Engineers, November 2000. 16.

by examining the inclusion and enforceability of performance criteria in in-lieu-fee agreements and by examining financial and legal assurances for the long-term management of in-lieu-fee sites.

## Performance standards

The inclusion of performance standards in an in-lieu-fee agreement helps ensure that mitigation for permitted wetland impacts occurs and is ecologically effective. The inclusion of performance standards also enables the sponsor and the regulatory agency to determine if the project site or sites are achieving the project's goals. Prior to issuance of the 2000 in-lieu-fee guidance, the legal responsibilities of in-lieu-fee sponsors for meeting performance standards as a condition of accepting fees was unclear.[612] Sponsors could receive in-lieu fees without any specific requirements guiding the final outcome of a mitigation site. According to the 2000 guidance, "a plan detailing specific performance standards should be submitted to ensure that the technical success of the project can be evaluated."[613] The recent GAO report found that the guidance did not go far enough in standardizing the necessary performance standards.[614]

Sixty of the nation's 87 in-lieu-fee programs provide information on whether or not the authorizing instruments include performance standards. Forty-two of these programs contain required performance standards for their in-lieu-fee sites.[615] The Buffalo district was unable to provide information on whether or not its 27 programs (four in New York and 23 in Ohio), have performance criteria. Georgia's program does not have set standards because its program focuses exclusively on preservation.[616]

Performance standards differ significantly between in-lieu-fee programs. Some in-lieu-fee programs, such as those in South Carolina and several in Texas, provided very detailed performance standards including species to be planted and survival rates. Other in-lieu-fee programs, such as those in Kentucky and Arizona, do not contain in-depth requirements.

Seventeen of the nation's in-lieu-fee programs do not require any specific performance standards.[617] In these programs, the sponsor is not obligated to achieve any defined outcomes at their mitigation sites. For example, the agreement between the Sacramento district and The Nature Conservancy to establish an in-lieu-fee program specifically states that "The Nature Conservancy does not guarantee any specific results, actions, or effects on any lands acquired, managed or restored under this agreement but will use good faith efforts to the meet the objectives of the program."[618] Virginia's program has informal performance standards and the Corps is working on creating formal standards. In addition, the in-lieu-fee programs in the South Florida Water Management District have internal criteria for the site that have not yet been formalized through the state agency.

## Monitoring

The 2000 guidance states in-lieu-fee projects should submit regular monitoring reports to document the success of the projects and "the Corps, in conjunction with other Federal and State agencies, should evaluate the reports and conduct regulate reviews" to ensure that the projects are operating effectively.[619] The guidance does not require specific monitoring periods or clearly designate the criteria to be monitored. As a result, the majority of in-lieu-fee authorizing instruments are equally vague. The majority of the instruments state that the Corps or appropriate state agency can visit the sites but do not list specific timeframes for these visits to occur. The majority of the instruments do, however, re-

[612] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act*. Washington, D.C.: National Academy Press, 2001. 87.

[613] U.S. Department of the Army, U.S. Environmental Protection Agency, U.S. Department of Interior, and U.S. Department of Commerce. *Federal Guidance on the Use of In-Lieu-Fee Arrangements for Compensatory Mitigation under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act*. 2000. 66916.

[614] United States General Accounting Office. *Wetlands Protection: Assessments Needed to Determine Effectiveness of In-Lieu Fee Mitigation*. GAO-01-325. May 4, 2001. 16.

[615] Arizona (1), California (4), Florida (2), Idaho (2), Illinois (2), Kentucky (2), Louisiana (18), Maryland (1), New Jersey (1), North Carolina (1), Oregon (1), Pennsylvania (1), South Carolina (2) and Texas (4).

[616] Georgia Environmental Policy Institute. *Agreement Between the Georgia Land Trust Service Center and the U.S. Army Corps of Engineers, Savannah District*. GA. 1997.

[617] Alaska (4), California (3), Florida (2), Missouri (4), Ohio (2), Virginia (1), and Washington (1).

[618] The Nature Conservancy. *Agreement Between The Nature Conservancy and the Regulatory Branch, U.S. Army Corps of Engineers, Sacramento District to Establish a Fee-Based Compensatory Mitigation Program Under Section 404 of the Clean Water Act*. CA, CO, NV, and UT. 2000.

[619] U.S. Department of the Army, U.S. Environmental Protection Agency, U.S. Department of Interior, and U.S. Department of Commerce. *Federal Guidance on the Use of In-Lieu-Fee Arrangements for Compensatory Mitigation under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act*. 2000. 66917.

quire that the sponsor issue an annual report to the regulatory agency to describe how the sites are performing.

### Long-term management

Once wetlands become fully functional, long-term management is critical to ensure that wetland functions will be maintained in perpetuity. Because permitted wetland impacts are permanent, so too should be wetland mitigation. One component of long-term management is the protection of the in-lieu-fee sites in perpetuity through legal mechanisms. Monitoring criteria need to exist to ensure that the site continues to perform as planned. In addition, funding must be made available to ensure that long-term monitoring and maintenance can be provided.

The vast majority of the active in-lieu-fee programs, (76 of the 87 programs), require that the sites be protected in perpetuity.[620] A few of the first sites under the Oregon state program were not required to be protected in perpetuity, but now all of the sites under this program are protected. The programs that require that their sites be protected in perpetuity primarily rely on fee title and conservation easements as the mechanism for legal protection of the sites. Some programs, such as the state program in Arizona, the two Louisville District programs, the Jacksonville District program, and the program in the South Florida Water Management District and in Palm Beach County, Florida, only place sites on state land and then rely on the status of the state land to protect the sites.

The four programs in Missouri under the Missouri Conservation Heritage Foundation encourage the use of fee titles and conservation easements to protect the sites in perpetuity. However, the Missouri Conservation Heritage Foundation program allows the land to be protected by 30-year contracts if the landowner does not want to sell the land. The state in-lieu-fee program in Louisiana only requires that marsh mitigation sites be protected for 20 years and that forested wetland sites be protected for 50 years. Pennsylvania does not require that in-lieu-fee mitigation sites be protected in perpetuity.

Sponsors of wetland mitigation banks typically must post financial assurances to ensure that mitigation projects are completed. In contrast, most in-lieu-fee programs do not require the posting of financial assurances prior to the collection of fees since program capitalization comes entirely from fee revenues.[621] Some in-lieu-fee programs may include a risk cost in the fee rates charged to permittees. These premiums provide extra financial resources for the repair or replacement of failed mitigation projects to compensate for the fact that in-lieu-fee mitigation is not conducted in advance of impacts.[622]

### Legal responsibility

Under in-lieu-fee programs, the legal responsibility for undertaking the mitigation shifts from the permittee to the in-lieu-fee sponsor. The 2000 in-lieu-fee guidance states that authorizing agreement should clearly specify that the legal responsibility for the ecological performance of the mitigation site rests with the organization accepting the payments in-lieu of mitigation.[623] This clear shift in legal responsibility is essential for the regulatory entity to enforce in-lieu-fee agreements and to ensure that the agreement goals are met.

Seven in-lieu-fee programs do not provide any information on which party has legal responsibility for fulfilling the mitigation when the funds are collected.[624] Half —or 44 of the 87 active in-lieu-fee program agreements—are silent as to whether the sponsor has legal responsibility for completing the mitigation.[625] Thirty-six in-lieu-fee programs state specifically that the sponsor is legally responsible for the mitigation once payment has been accepted from the permittee.[626]

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[620] Alaska (4), Arizona (1), California (4), Florida (4), Idaho (2), Illinois (2), Kentucky (2), Louisiana (17), Maryland (1), New Jersey (1), New York (4), North Carolina (1), Ohio (25), Oregon (1), South Carolina (2), Texas (4), and Virginia (1).

[621] Scodari and Shabman. *Review and Analysis of In Lieu Fee Mitigation in the CWA Section 404 Permit Program.* Alexandria, VA: Institute for Water Resources, U.S. Army Corps of Engineers, November 2000. 16.

[622] *Id.*

[623] U.S. Department of the Army, U.S. Environmental Protection Agency, U.S. Department of Interior, and U.S. Department of Commerce. *Federal Guidance on the Use of In-Lieu-Fee Arrangements for Compensatory Mitigation under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.* 2000. 66916.

[624] California (1), Idaho (2), Kentucky (2), Louisiana (1), and Washington (1).

[625] Alaska (4), California (2), Florida (1), Georgia (1), Missouri (4), New York (4), Ohio (25), Pennsylvania (1), Texas (1), and Virginia (1).

[626] Arizona (1), California (4), Florida (3), Illinois (2), Louisiana (18), New Jersey (1), North Carolina (1), Oregon (1), South Carolina (2), and Texas (3).

## SITE SELECTION

### In-kind

In order to assure that specific wetland functions are not lost through permitted impacts, compensatory mitigation generally requires in-kind mitigation, or mitigation of the same type of wetland as that lost through the permitted activities. The 2000 in-lieu-fee guidance expresses a preference of in-kind mitigation in in-lieu-fee projects.[627] In-kind replacement is not specifically required in many in-lieu-fee programs. Only eight in-lieu-fee programs specify that they only provide in-kind mitigation.[628]

Other programs may limit the types of impacts that may be mitigated by paying into an in-lieu-fee program. For example, four programs in the Los Angeles district do not allow impacts to unique aquatic resources such as vernal pools or tidal or estuarine wetlands to be compensated through the in-lieu-fee programs. The Beidler Forest in-lieu-fee program in South Carolina does not allow impacts to emergent marshes, saltwater tidal systems, or Carolina Bays to be compensated through payment to the program.

### Regional planning

The 2000 in-lieu-fee guidance states that in-lieu-fee mitigation should be "developed to address the specific resource needs of a particular watershed."[629] Selection of sites for in-lieu-fee projects "should be conducted on a watershed scale in order to maintain wetland diversity, connectivity, and the appropriate proportions of upland and wetland systems needed to enhance the long-term stability of wetland systems."[630] Regional watershed evaluation greatly enhances "the protection of wetlands and the creation of wetland corridors that mimic natural distributions of wetlands in the landscape."[631] A 2000 study found that while the goal of in-lieu-fee programs is watershed restoration and protection, few in-lieu-fee programs are guided by a formal watershed plan to assure that the mitigation projects serve priority wetland needs in affected watersheds (see section III. "Compensatory mitigation and the watershed approach").[632]

Several state in-lieu-fee programs are, however, guided by a statewide watershed plan. The North Carolina in-lieu-fee program requires a detailed analysis of the needs of the local watersheds. The North Carolina program requires the establishment of Basinwide Wetland Riparian Restoration Plans for each of the 17 river basins in the state. A key component of the basinwide approach is the development of local watershed plans to protect and enhance water quality, flood prevention, fisheries, wildlife habitat, and recreational opportunities in each river basin.[633] Mitigation project selection, including in-lieu-fee projects, must then be consistent with the basinwide restoration plans. The in-lieu-fee program targets and prioritizes degraded wetland and riparian areas that, if restored, would contribute significantly to the goal of protecting and enhancing watershed functions.[634] Prioritizing watershed sites based on their restoration feasibility and the critical restoration needs helps ensure that resources are used in the most efficient manner.[635]

Maine has undertaken a similar effort to characterize all of the watersheds in the state to record the existing wetlands, determine what functions they provide, and highlight the importance of wetlands that are threatened by development or degradation. This information will be used in order to determine where mitigation projects should be located.

Some in-lieu-fee program administrators state that the use of in-lieu-fee mitigation can help to ensure a greater diversity of compensatory mitigation projects on a watershed basis, including projects involving relatively costly but regionally important wetland protection and restoration efforts.[636] Two examples serve to

[627] U.S. Department of the Army, U.S. Environmental Protection Agency, U.S. Department of Interior, and U.S. Department of Commerce. *Federal Guidance on the Use of In-Lieu-Fee Arrangements for Compensatory Mitigation under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act*. 2000. 66915.

[628] California (1), Florida (2), Louisiana (1), North Carolina (1), and Texas (3).

[629] U.S. Department of the Army, U.S. Environmental Protection Agency, U.S. Department of Interior, and U.S. Department of Commerce. *Federal Guidance on the Use of In-Lieu-Fee Arrangements for Compensatory Mitigation under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act*. 2000. 66916.

[630] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act*. Washington, D.C.: National Academy Press, 2001. 4.

[631] *Id*.

[632] Scodari and Shabman. *Review and Analysis of In Lieu Fee Mitigation in the CWA Section 404 Permit Program*. Alexandria, VA: Institute for Water Resources, U.S. Army Corps of Engineers, November 2000. viii.

[633] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act*. Washington, D.C.: National Academy Press, 2001. 208.

[634] *Id.* at 209.

[635] *Id*.

[636] Scodari and Shabman. *Review and Analysis of In Lieu Fee Mitigation in the CWA Section 404 Permit Program*. Alexandria, VA: Institute for Water Resources, U.S. Army Corps of Engineers, November 2000. 12.

illustrate how in-lieu-fee programs can be used to address the specific resource needs of a particular watershed. The Palm Beach County, Florida in-lieu-fee program is linked to a regional planning effort. All of the funds collected under the program are directed to the acquisition and enhancement of an important corridor linking two wildlife conservation areas. The Historic Ricefields in-lieu-fee program agreement in South Carolina specifies that the best available sites will necessarily involve habitats that have State Priority Management Area designation.[637]

### Site selection procedures

According to the 2000 guidance, federal agencies and in-lieu-fee sponsors should carefully consider the ecological suitability of a site for achieving the goals of the required compensatory mitigation.[638] The guidance states that the "location of the site relative to other ecological features, hydrologic sources, and compatibility with adjacent land uses and watershed management plans" must be considered.[639] Before the Corps approves the use of in-lieu-fee mitigation, the sponsor and the Corps should enter into a formal agreement that describes, "potential site locations, baseline condition at the sites, and general plans that indicate what kind of wetland compensation can be provided."[640]

Approving sites before the in-lieu-fee sponsor receives funds can reduce the lag time between when funds are collected and when mitigation occurs.[641] For example, the Calleguas Creek program in the Los Angeles district has collected almost a million dollars. The sponsor, California Coastal Conservancy, is now going through the process of ranking sites and none of the money has been spent directly on mitigation. If this ranking process had been completed before the sponsor received the funds, the lag time may have been greatly reduced.

Approving sites before the receipt of fees can also help ensure that the sites picked are suitable for mitigation. For example, the New Jersey Mitigation Council does not pay any of the collected in-lieu-fees to potential program sponsors until the council has approved the proposed mitigation sites, ensuring that sites are suitable for mitigation before funds are given to a sponsor.

Some in-lieu-fee agreements approve specific mitigation projects for which mitigation plans have been developed, such as the Singer Lake Bog and Somerford Township programs in Ohio and the South Florida Water Management District and Palm Beach County programs in Florida.[642] Other in-lieu-fee programs simply establish the process by which the sponsor will receive funds, seek site approval, and undertake mitigation projects. In the latter case, the programs may require that the sponsor follow a designated procedure for choosing the mitigation sites and the submission of site plans prior to approval. This procedure may require the sponsor to weigh specific factors in choosing sites. Twenty programs require that the sponsor establish and follow some type of procedure or plan to select mitigation sites.[643] These required procedures help ensure that the proposed sites will lead to functional mitigation sites.

In addition to requiring procedures to guide the selection of mitigation sites, several in-lieu-fee programs may require the appointment of an oversight committee to evaluate whether the selected sites are likely to become functioning wetlands. As discussed earlier, many in-lieu-fee programs lack stringent performance criteria. The committee's analysis of the proposed sites may help to overcome some, but not all, of the weaknesses of in-lieu-fee programs that do not require monitoring of performance. Eight in-lieu-fee programs require the formation of advisory committees to advise on the site selection for mitigation projects.[644] Alaska has three programs that allow the formation of advisory committees but do not require them. These committees usu-

[637] Historic Ricefields Association. *Historic Ricefields Association Waccamaw and Pee Dee River Basins In-Lieu Fee Mitigation Program Implementation Instrument.* SC. 2000.

[638] U.S. Department of the Army, U.S. Environmental Protection Agency, U.S. Department of Interior, and U.S. Department of Commerce. *Federal Guidance on the Use of In-Lieu-Fee Arrangements for Compensatory Mitigation under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.* 2000. 66916.

[639] *Id.*

[640] *Id.* at 66917.

[641] Environmental Law Institute and the Institute for Water Resources. *Wetland Mitigation Banking: Resource Document.* 1994. 98.

[642] Cleveland Museum of Natural History. *Singer Lake Bog In Lieu Fee Mitigation Arrangement Between the U.S. Army Corps of Engineers, Huntington District and the Cleveland Museum of Natural History.* OH. 1999; Ohio Wetlands Corporation. *Wetland Mitigation In-Lieu Fee Agreement.* OH. 1998.

[643] Alaska (4), California (3), Florida (1), Georgia (1), Illinois (2), Missouri (4), North Carolina (1), South Carolina (2), Texas (1), and Virginia (1).

[644] California - the Los Angeles County Aquatic Resource Program; Florida – Audubon of Florida Program; Georgia – Savannah district Program; Illinois – Corporation for Open Lands and Chicago district Program; North Carolina – Wetlands Restoration Program; South Carolina – Beidler Forest Program and Historic Ricefields Program; and Texas – The Nature Conservancy and Fort Worth district Program.

ally consist of representatives from the Corps, state agencies, and "wetland specialists."[645] Another option is to use the wetland mitigation banking MBRT as an oversight body. The two South Carolina in-lieu-fee programs require that the sponsor submit site proposals to the MBRT for approval and are the only programs to require the approval of the MBRT.[646]

## STREAM IMPACTS

Stream mitigation in-lieu-fee programs are a new trend in compensatory mitigation. Many of the active in-lieu-fee programs, including those not specifically designed to address impacts to streams, accept funds for impacts to streams. Specifically, 41 of the 87 active in-lieu-fee programs accept funds for impacts to streams.[647] Six in-lieu-fee programs are designed exclusively to accept funds for impacts to streams and to undertake stream mitigation projects: two in Kentucky and four in Missouri. In addition, the state program in Oregon, the state program in North Carolina, and the in-lieu-fee program in the Fort Worth district, are designed to undertake stream mitigation projects, in addition to other types of wetland mitigation projects. Thirty-six in-lieu-fee programs did not explicitly indicate whether or not the programs were authorized to accept funds for impacts to streams.[648]

## FEE ASSESSMENT

The determination of the amount an in-lieu-fee program charges to the permittee is a crucial component of an in-lieu-fee program. According to the 2000 guidance, the amount of the in-lieu-fee funds collected should be based on "a reasonable cost estimate of all funds needed to compensate for the impacts to wetlands or other waters that each permit is authorized to offset."[649] Funding should cover the costs of planning, land acquisition, construction and planting, monitoring and maintenance, and bonding to cover potential failure. If the fee charged is insufficient to cover the full costs of the required mitigation, the in-lieu-fee program may fail to provide the required compensation.

The amount of fee assessed can influence whether a permittee chooses to utilize an in-lieu-fee program or a mitigation bank, assuming their availability. Maryland's state regulatory agency has found that its fees are too low and should be reevaluated to accurately reflect the cost of the mitigation projects. If a state agency—and by extension, tax payers—choose to subsidize a state in-lieu-fee program, the in-lieu-fee program may charge lower fees and may not recover the costs of undertaking the mitigation project. The in-lieu-fee program in Pennsylvania does not factor land values into the fee rate since the program uses donated private lands for project siting and thus land values are not a recognized program cost. In addition, Pennsylvania's state agency pays for the cost of evaluating a potential wetland site, and thus this cost is also not included in the fee rate.

Fourteen in-lieu-fee programs made available the amount of in-lieu fees charged.[650] Of these 14 programs, seven are Corps-administered, six are state-administered programs, and one is locally administered. The amount charged varies greatly from program to program, ranging from $8,000 per acre of mitigation in the Singer Lake Bog program in Ohio to $175,000 per acre of mitigation for the program in DuPage County, Illinois.[651] The average amount charged per acre of required mitigation is $49,000. The programs in Oregon and North Carolina charge different rates depending on the type of wetland that is being mitigated. For example, the state in-lieu-fee program in Oregon charges $48,700 per acre for freshwater emergent wetland,

[645] The Great Land Trust. Agreement Between the Great Land Trust and the Regulatory Branch, U.S. Army Corps of Engineers, Alaska District to Establish a Fee-Based Compensatory Mitigation Program Under Section 404 of the Clean Water Act. AK. 1998; Kachemak Heritage Land Trust. *Agreement Between Kachemak Heritage Land Trust and the Regulatory Branch, U.S. Army Corps of Engineers, Alaska District to Establish a Fee-Based Compensatory Mitigation Program Under Section 404 of the Clean Water Act.* AK. 1999; Southeast Alaska Land Trust. *Agreement Between the Southeast Alaska Land Trust and the Regulatory Branch, USACE, Alaska District to Establish a Fee-Based Compensatory Mitigation Program Under Section 404 of the Clean Water Act.* AK. 1998.

[646] National Audubon Society. *Beidler Forest In-Lieu Fee Mitigation Program Implementation Instrument.* SC. 2000; Historic Ricefields Association. *Historic Ricefields Association Waccamaw and Pee Dee River Basins In-Lieu Fee Mitigation Program Implementation Instrument.* SC. 2000.

[647] Alaska (4), Arizona (1), California (4), Georgia (1), Idaho (2), Illinois (1), Kentucky (2), Louisiana (17), Maryland (1), Missouri (4), North Carolina (1), Oregon (1), Texas (1), and Virginia (1).

[648] California (1), Florida (1), New Jersey (1), New York (4), Ohio (23), South Carolina (2), Texas (3), and Washington (1).

[649] U.S. Department of the Army, U.S. Environmental Protection Agency, U.S. Department of Interior, and U.S. Department of Commerce. *Federal Guidance on the Use of In-Lieu-Fee Arrangements for Compensatory Mitigation under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.* 2000. 66916.

[650] California – Los Angeles district (2), Florida (2), Idaho (2), Illinois – DuPage County (1), Kentucky (2), Maryland (1), North Carolina (1), Ohio (1), Oregon (1), and Pennsylvania (1).

[651] DuPage County Countywide Stormwater and Flood Plain Ordinance §15-136.

$77,900 per acre for freshwater forested wetland, and $18,100 per acre for salt marsh restoration.

Only two programs provided information on fees charged for mitigation of stream impacts. North Carolina's in-lieu-fee program charges $125 per linear foot of mitigation and Kentucky's two programs, one with Northern Kentucky University and one with the Louisville and Jefferson County Metropolitan Sewer District, charge $120 per linear foot of mitigation, but a multiplier may be added if the impact occurred to a relatively unimpacted area.

The question of who determines the fee charged by an in-lieu-fee program has generated some controversy. The appearance of a potential conflict of interest may arise when a state regulatory agency sets the price for mitigation. The agency may be viewed as soliciting contributions to a government-operated fund in exchange for a permit.[652] Fifty-four of the 87 active programs provided information on who determines the amount of the in-lieu-fee. Most of the in-lieu-fee programs that provided information, 40 out of 54, have tried to avoid this appearance of conflict by allowing the sponsor to set the fee.[653] The Corps has been particularly careful about distancing itself from the process used to determine the fee. Only two in-lieu-fee programs sponsored by the Corps, one in Arizona and one in Florida, allow the Corps to set the fees to be charged in its in-lieu-fee programs. In contrast, the majority of the state-administered and locally administered programs primarily allow the regulatory agency to set the fees. Nine out of the 12 state-administered programs allow the fees to be set either through mandated fees in their statutes and regulations or by allowing the state to set the fee directly.[654] Two out of the three locally administered programs allow the fee to be set either through mandated fees in their ordinances or by allowing the local government to set the fee directly.[655]

The question of the steps used to calculate the amount of the in-lieu-fee charged is also controversial. The actual costs to the permittee to participate in the in-lieu-fee program as compared to the costs of a mitigation bank may make one of the options more attractive than the other. In addition, the fee charged must be sufficient to meet the costs of undertaking the required mitigation. Many options exist to determine the amount of the fee to charge. Regulatory entities may choose to place the specific fee amount in their statutes or regulations establishing the in-lieu-fee programs or they may create different formulas for determining the fee.

Of the 87 active programs, 30 did not provide information about how their fees are determined (27 of these 30 programs are in the Buffalo district).[656] The fees for three programs are mandated in state or local statutes and regulations.[657] The remaining 54 programs use various formulas to dictate the fee charged. These formulas primarily attempt to base the fee on the actual costs to undertake the mitigation projects by the sponsor. Some of the formulas may contain added components, such as the program in Georgia, which includes a contribution to a legal defense fund in the formulation of the fee amount. Two programs, the Norfolk district program in Virginia and the program in Sacramento County, California, consider the prices for purchasing credits from wetland mitigation banks in the area, including private commercial banks when setting their in-lieu fees. The Sacramento County program bases its in-lieu fees on the prices for purchasing credits from wetland mitigation banks in the area, while the Virginia program considers the cost to undertake the mitigation and also considers the prices of banks in the area. The Virginia program explicitly sets its prices so as not to undercut for-profit banks.[658]

## IN-LIEU-FEE MITIGATION REPLACEMENT RATIOS

The replacement ratios for in-lieu-fee programs relate to the amount of mitigation that must be purchased to compensate for the amount of permitted wetland loss. According to the 2000 in-lieu-fee guidance, "funds collected should ensure a minimum of one for one acreage replacement."[659] The two programs in Idaho sponsored by The Nature Conservancy and Ducks Unlimited and the program in Clallum County, Washington reported not using replacement ratios. With the Idaho programs, the Corps determined mitigation projects that it wanted

[652] Royal Gardner. *Money for Nothing? The Rise of Wetland Fee Mitigation*. 19 Va. Envtl. L.J. 1, 2000. 44.
[653] Alaska (4), California (5), Georgia (1), Illinois (1), Kentucky (2), Louisiana (17), Missouri (4), South Carolina (2), and Texas (3).
[654] Florida (3), Louisiana, Maryland, New Jersey, North Carolina, Oregon, and Pennsylvania.
[655] Sacramento County, California and DuPage County, Illinois.
[656] New York (4), Ohio (24), Texas (1), and Washington (1).
[657] Illinois (1), North Carolina, and Pennsylvania.
[658] Mulrooney, Keith. Personal correspondence. 18 July 2002.
[659] U.S. Department of the Army, U.S. Environmental Protection Agency, U.S. Department of Interior, and U.S. Department of Commerce. *Federal Guidance on the Use of In-Lieu-Fee Arrangements for Compensatory Mitigation under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act*. 2000. 66916.

completed and then offered permittees the option of financing these projects as compensation for the permitted impacts; thus the size of the projects was not based on the size of the impacts.

Most of the active in-lieu-fee programs, 75 out of 87, rely on the Corps to determine the replacement ratio.[660] The remaining programs rely on the state agency to determine the replacement ratios.

In-lieu-fee programs use a variety of methods to determine replacement ratios. Fourteen programs set replacement ratios in their authorizing instruments.[661] Of the programs that specify ratios in the authorizing instruments, most require a replacement ratio that is higher than 1:1. For example, the DuPage County, Illinois program requires a 1.5:1 replacement ratio unless critical wetlands are impacted and then the ratio is raised to 3:1.[662] An exception occurs in the South Florida Water Management District and Palm Beach County programs in Florida. These programs usually require a 1:1 ratio, but if melaleuca control (an invasive plant species) is part of the mitigation project, then the replacement ratio may be slightly less than 1:1.

Three programs use a detailed formula set out in Corps standard operating procedures to determine the replacement ratio.[663] For example, the Georgia program considers the effect, duration of the effect, rarity of the impacted land, and the existing conditions when determining the replacement ratio.[664] Twenty-five programs use functional assessments to determine the replacement ratio.[665] Thirty-five in-lieu-fee programs rely on best professional judgment to determine the replacement ratios and thus are determined on a case-by-case basis.[666]

Since mitigation conducted under an in-lieu-fee program typically occurs after permitted impacts, a temporal loss of wetlands results. In-lieu-fee programs may require higher replacement ratios to compensate for this temporal loss. This policy may be stated explicitly in authorizing instruments. For example, the Beidler Forest in-lieu-fee program in South Carolina states that a functional lag of up to three years has been accounted for in the credit schedule tables that determine the replacement ratios.[667] Another method of compensating for the temporal loss with the replacement ratios is by raising the replacement ratios if the project exceeds a certain time period. For example, the Calleguas Creek in-lieu-fee program in California specifically states that the replacement ratios will be raised to account for increased temporal losses of aquatic resource functions and values if a project exceeds three years.[668]

Individual in-lieu-fee projects may achieve higher than expected replacement of wetland acreage and function, thus offsetting the time lag between permitted fills and compensation.[669] The in-lieu-fee program in Virginia demonstrates this possibility. It has only spent one-third of its total fees, but its completed and ongoing mitigation projects are already providing more mitigation than is required for the permitted impacts.[670]

## IN-LIEU-FEE PROGRAM SERVICE AREAS

One criticism of in-lieu-fee programs is that they may not require that funds collected for impacts in one watershed be used for mitigation projects in that same watershed, thus leading to the loss of wetland acreage and functions in a particular region.

Twenty-three of the 87 active programs, including over half of the state-sponsored programs, do not have mandated delineated geographic service areas. In other words, mitigation is not required to occur in the same area as the permitted impact.[671] In four of the programs without mandated service areas, however, the regulatory agency informally tracks the impacted areas and

[660] Alaska (4), Arizona (1), California (6), Florida (2), Georgia (1), Illinois (1), Kentucky (2), Louisiana (17), Missouri (4), New York (4), North Carolina (1), Ohio (25), South Carolina (2), Texas (4), and Virginia (1).

[661] California (1), Florida (2), Illinois (2), Louisiana (2), Maryland (1), New Jersey (1), Ohio (2), Oregon (1), Pennsylvania (1), and Virginia (1).

[662] DuPage County Countywide Stormwater and Flood Plain Ordinance §15-136.

[663] Georgia (1) and South Carolina (2).

[664] Savannah District Standard Operating Procedure, Compensatory Mitigation, 2000.

[665] Alaska – Conservation Fund Program, Great Land Trust Program, Kachemak Heritage Land Trust Program, and Southeast Alaska Land Trust Program; California – Los Angeles district programs (4); Florida – Audubon of Florida Program; and Louisiana – New Orleans district programs (16).

[666] California (1), Florida (1), Kentucky (2), New York (4), Ohio (23), and Texas (4).

[667] National Audubon Society. *Beidler Forest In-Lieu Fee Mitigation Program Implementation Instrument*. SC. 2000.

[668] California Coastal Conservancy. *Agreement for the Establishment and Administration of the Calleguas Creek Watershed (Ventura County, California) Aquatic Resource In-Lieu Fee Compensatory Mitigation Program between the U.S. Army Corps of Engineers, Los Angeles District and the California Coastal Conservancy*. CA.

[669] Scodari and Shabman. *Review and Analysis of In Lieu Fee Mitigation in the CWA Section 404 Permit Program*. Alexandria, VA: Institute for Water Resources, U.S. Army Corps of Engineers, November 2000. 15.

[670] *Id.*

[671] Alaska (4), Arizona (1), California (1), Georgia (1), Idaho (2), Louisiana (2), Maryland (1), New Jersey (1), Ohio (2), Pennsylvania (1), Illinois (1), Texas (4), Virginia (1), and Washington (1).

attempts to replace lost wetlands in the same geographic area where impacts have occurred over the long-term.[672] In addition, 10 of these programs have an informal policy to attempt to keep the impacts in the same watershed even though they are not so obligated.[673]

Sixty-four of the 87 active in-lieu-fee programs require the use of delineated service areas.[674] Oregon's state program offers a unique approach. The funds must be used in the region where the impact occurred in the two years following the impacts. If no project has been identified after two years, the regional limitation no longer applies. Of these 64 programs, 17 very specifically define the service area for the in-lieu-fee programs.[675] For example, the North Carolina program requires the sponsor to mitigate for permitted impacts within the same eight-digit hydrological cataloging unit, and all of the activities of North Carolina's fund must be consistent with restoration plans developed for each of the state's 17 river basins. The Missouri in-lieu-fee program is split into 10 regions. Mitigation funds must be kept in the region where the impact occurred. Forty-seven of the 64 programs require that the mitigation must occur in the same watershed as the impact, but do not specifically define the geographical extent of the watershed.

## TIMING

Like wetland mitigation banking, in-lieu-fee programs have the ability to raise capital to conduct mitigation after the permitted impacts have occurred. With wetland mitigation banking, the majority of banks are authorized to sell credits in advance of conducting mitigation activities (see section IV. "Credit release"). In-lieu-fee sponsors typically collect fees from multiple permit recipients.[676] These fees often come from a myriad of small impacts, particularly in those programs that are established to require mitigation for small impacts that are not regulated through §404. As a result, it may take a long time for in-lieu-fee providers to amass the funds necessary to implement appropriate mitigation.

The lag time between payment of fees and both the implementation of a wetland mitigation project and attainment of functions have been criticisms of in-lieu-fee programs. Undoubtedly, locating suitable sites for mitigation may be more difficult in some parts of the county than others. For example, it may be more time consuming to identify suitable sites in urban settings and siting mitigation sites close to the site of the permitted loss. Nonetheless, although lag times between permitted impacts and replacement of wetland functions exist in the majority of wetland mitigation banking and in-lieu-fee mitigation projects, the temporal loss of wetland functions with in-lieu-fee programs seems to be more significant than those with wetland mitigation banking.

According to the 2000 in-lieu-fee guidance, "land acquisition and initial physical and biological improvements should be completed by the first full growing season following collection of the initial funds."[677] Since site improvements associated with in-lieu-fee mitigation may take longer to initiate, the 2000 guidance does allow the initial physical and biological improvements to be completed by the second full growing season when the initiation by the first full growing season is not practicable, the guidance suggests that mitigation ratios should be raised to account for increased temporal losses, and the delay is approved in advance by the Corps.[678]

Most in-lieu-fee programs, 58 of the 87 programs, do not require that the collected funds be spent in a specific time frame.[679] The agreements establishing these programs are either silent as to when the funds must be spent or allow the sponsor to allocate funds when the sponsor determines that an adequate amount has been collected and has identified an appropriate mitigation project. Twelve programs did not provide information on the timeframe for spending collected funds.[680] Seventeen programs specify time frames by which collected

[672] Illinois (1), Pennsylvania (1), Texas (1), and Virginia (1).
[673] Arizona (1), California (1), Georgia (1), Idaho (2), Louisiana (1), New Jersey (1), and Texas (3).
[674] California (6), Florida (4), Illinois (1), Kentucky (2), Louisiana (16), Missouri (4), New York (4), North Carolina (1), Ohio (23), Oregon (1), and South Carolina (2).
[675] California (6), Florida (3), Illinois (1), Missouri (4), North Carolina (1), and South Carolina (2).
[676] Scodari and Shabman. *Review and Analysis of In Lieu Fee Mitigation in the CWA Section 404 Permit Program.* Alexandria, VA: Institute for Water Resources, U.S. Army Corps of Engineers, November 2000. 2.
[677] U.S. Department of the Army, U.S. Environmental Protection Agency, U.S. Department of Interior, and U.S. Department of Commerce. *Federal Guidance on the Use of In-Lieu-Fee Arrangements for Compensatory Mitigation under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.* 2000. 66916.
[678] *Id.*
[679] Alaska (4), California (6), Georgia (1), Illinois (1), Louisiana (16), Maryland (1), New York (4), Ohio (24), and Pennsylvania (1).
[680] Arizona (1), Florida (3), Idaho (2), Kentucky (2), Louisiana (2), New Jersey (1), and Washington (1).

### REDUCING THE LAG TIME IN NORTH CAROLINA

The in-lieu-fee program in North Carolina contains a mechanism designed to overcome the problem faced by most in-lieu-fee programs: raising the capital necessary to provide mitigation in advance of permitted impacts. North Carolina's program receives up-front funding through state appropriations that goes into a revolving loan fund. To initiate the planning and wetland restoration program, the state provided $6 million to the fund, with additional funding to be provided in future years.[686] In addition, the North Carolina Department of Transportation pays $2.5 million each year for seven years.[687] Other states could follow this model when developing their in-lieu-fee programs and designate initial capital for the in-lieu-fee fund from general revenue sources, such as the federally funded State Revolving Loan Fund.[688] This up-front funding is supposed to enable the program to immediately move forward with mitigation planning and implementation. Wetland projects could then meet priorities established in formally developed wetland plans or in plans developed by a consensus of agency regulators and wetland scientists.[689] This initial funding of the in-lieu-fee program is then to be repaid as mitigation fee payments are received for §404 permits. [690]

funds should be spent.[681] These timeframes varied in length from one to ten years. The shortest, the Calleguas Creek in-lieu-fee program in California, requires fees to be spent the first full growing season after collecting the funds.[682] The longest time lag is that specified for the DuPage County, Illinois program, which allows the fees to be collected for 10 years before any mitigation must be completed.[683] The average time by which mitigation funds needed to be spent to replace lost wetlands is three years, but many of these timeframes can be extended on a case-by-case basis.

In-lieu-fee programs that specify contingency actions if funds are not spent in the allotted period typically required that the funds be spent on a project or turned over to another non-profit entity for use in mitigation. North Carolina's program has a shifting timeframe. Funds collected in the first year of operation of the program must be spent within three years, funds collected in the second year of operation must be spent within two years, and funds collected in the third year and beyond must be spent within one year.[684]

Seven of the in-lieu-fee programs have collected funds but have not yet spent any of their funds.[685] These lag times may be due to a number of factors, such as newness of the program, lack of available sites, or inadequate funding.

## USE OF IN-LIEU-FEE FUNDS

### Restoration, creation, enhancement, preservation

The majority of in-lieu-fee mitigation projects employ multiple mitigation methods. Of the 60 active in-lieu-fee programs with available documentation on mitigation methods,[691] 57 allow restoration, 37 allow creation, 45 allow enhancement, and 53 allow preservation.[692]

The use of mitigation fees to preserve existing wetlands has generated some controversy as this practice does not serve to replace lost acreage, and therefore does not contribute to the national no net loss goal. According to the 2000 in-lieu-fee guidance, preservation alone as a form of compensatory mitigation may only be accepted in exceptional circumstances. Mitigation credit may, however, be given for preservation if it is conducted

[681] California – Calleguas Creek Watershed Program; Florida – Audubon of Florida Program; Illinois – DuPage County Program; Missouri – Missouri Conservation Heritage Foundation Programs (4); North Carolina – Wetland Restoration Program; Ohio – Somerford Township; Oregon – Department of State Lands Program; South Carolina – Beidler Forest Program and Historic Ricefields Program; Texas – The Nature Conservancy and Fort Worth district Program, National Fish and Wildlife Foundation Program, Texas Parks and Wildlife Program, and Katy Prairie Conservancy Program; and Virginia – The Nature Conservancy Program.

[682] California Coastal Conservancy. *Agreement for the Establishment and Administration of the Calleguas Creek Watershed (Ventura County, California) Aquatic Resource In-Lieu Fee Compensatory Mitigation Program between USACE, Los Angeles District and the California Coastal Conservancy*. CA.

[683] DuPage County Countywide Stormwater and Flood Plain Ordinance §15-136.

[684] North Carolina Department of Environment and Natural Resources. *Memorandum of Understanding Between the North Carolina Department of Environment and Natural Resources and the U.S. Army Corps of Engineers, Wilmington District*. MOU. NC. 1998.

[685] Alaska – Kachemak Heritage Land Trust Program; California – Ventura River Basin Watershed Program; Louisiana – Wetlands Restoration and Conservation Fund; and Missouri – Missouri Conservation Heritage Foundation Programs (4).

[686] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act*. Washington, D.C.: National Academy Press, 2001. 147.

[687] *Id*.

[688] *Id*. at 164.

[689] *Id*.

[690] Scodari and Shabman. *Review and Analysis of In Lieu Fee Mitigation in the CWA Section 404 Permit Program*. Alexandria, VA: Institute for Water Resources, U.S. Army Corps of Engineers, November 2000. 2.

[691] The Buffalo district did not provide information on the ability of its 27 in-lieu-fee programs to use preservation as a mitigation option.

[692] Alaska (4), Arizona (1), California (6), Florida (3), Georgia (1), Idaho (2), Illinois (1), Kentucky (2), Louisiana (17), Missouri (4), New Jersey (1), Ohio (2), Oregon (1), South Carolina (2), Texas (4), Virginia (1), and Washington (1).

"in conjunction with restoration, creation, or enhancement activities, and when it is demonstrated that the preservation will augment the functions of the restored, created, or enhanced aquatic resource."[693]

Many of the in-lieu-fee programs that allow preservation as a mitigation option attach some limitations to its use. Twelve of these limit the use of preservation to a component of a project, and do not allow preservation as the sole type of mitigation.[694] Sixteen of the programs in Louisiana only allow preservation when the impact does not cause a loss of wetlands but rather simply alters the wetlands.[695] The Savannah district in-lieu-fee program in Georgia is strictly for preservation projects, but its use is limited. The district uses a formula for determining mitigation requirements that allows a different mix of mitigation methods to compensate for a permitted impact. Generally at least 50 percent of a permit recipient's mitigation requirement must involve wetland restoration so the in-lieu-fee program, which focuses on preservation, can only be used to satisfy the non-restoration part of a permittee's mitigation requirement.[696]

[693] U.S. Department of the Army, U.S. Environmental Protection Agency, U.S. Department of Interior, and U.S. Department of Commerce. *Federal Guidance on the Use of In-Lieu-Fee Arrangements for Compensatory Mitigation under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.* 2000. 66916.

[694] California (4), Florida (2), Idaho (2), Oregon (1), South Carolina (2), and Texas (1).

[695] New Orleans district programs.

[696] Scodari and Shabman. *Review and Analysis of In Lieu Fee Mitigation in the CWA Section 404 Permit Program.* Alexandria, VA: Institute for Water Resources, U.S. Army Corps of Engineers, November 2000. 13.

### Other activities

Another concern with in-lieu-fee programs is that the collected funds may be used for activities other than the restoration, creation, enhancement, or preservation of wetlands. According to the 2000 in-lieu-fee guidance, funds collected under in-lieu-fee programs "should be used for replacing wetlands functions and values and not to finance non-mitigation programs, such as education projects and research."[697] The majority of the nation's in-lieu-fee programs do not allow funds to be used for alternate activities. Only nine programs verified that they have used the collected funds for activities other than restoration, creation, enhancement, or preservation of wetlands.[698] The Buffalo district did not provide information for its 27 programs. The program administered by the Galveston district indicated that the use of funds in this manner occurred before the release of the federal guidance and would not occur again. The program administered by the Chicago district only uses the funds for research on wetland creation when the program has already achieved the required mitigation ratio.

[697] U.S. Department of the Army, U.S. Environmental Protection Agency, U.S. Department of Interior, and U.S. Department of Commerce. *Federal Guidance on the Use of In-Lieu-Fee Arrangements for Compensatory Mitigation under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.* 2000. 66916.

[698] Alaska (1), California (1), Florida (1), Illinois (1), New Jersey (1), North Carolina (1), and Texas (3).

# VIII. "GRAY-AREA" AND AD HOC MITIGATION

Although on-site wetland mitigation remains the most prevalent form of compensatory mitigation,[699] three forms of off-site compensatory mitigation—wetland mitigation banking, wetland mitigation banking conducted through umbrella instruments, and in-lieu-fee mitigation—are now common mechanisms for a permittee to satisfy compensatory mitigation requirements. Since 1995, the federal wetland regulatory agencies have adopted several policies to define and guide these forms of compensatory mitigation. However, across the country vaguely defined and largely unsupervised off-site mitigation continues to be approved.

## GRAY-AREA MITIGATION

For the purposes of this study, gray-area mitigation is off-site compensatory mitigation that cannot be characterized as wetland mitigation banking (under a mitigation banking instrument or an umbrella instrument), in-lieu-fee mitigation, or off-site permittee-responsible mitigation. Gray-area mitigation is often referred to as consolidated banking, pooled mitigation, or mitigation fees.

Of the 23 Corps districts surveyed about gray-area mitigation, 14 indicated that they have utilized this method of compensatory mitigation. Of the 37 states surveyed about gray-area mitigation, 22 indicated that at least one project that would fall into this category has been conducted in their state.

In Washington State, gray-area mitigation has been used in several instances. The Corps issued a 20-year permit for an advanced mitigation project for Skagit County in 2000. Several permittees, including Bellingham Airport and King County, are pursuing "advanced mitigation" in lieu of establishing a mitigation bank. The Seattle district anticipates that the use of gray-area mitigation may be a trend on the rise in the district.[700]

Maryland is also approving a significant amount of mitigation that cannot be categorized as a wetland mitigation bank, umbrella bank, or in-lieu-fee arrangements. Despite the fact that the Maryland legislature has passed wetland mitigation banking legislation, the state currently uses advance mitigation sites or consolidation sites instead of banks. This program is guided only by informal rules. The Maryland Department of the Environment has secured approval from the Corps for this program. Typically, a consultant will buy a piece of property and develop it in advance of permitted wetland impacts. Often the consultant already has certain mitigation projects in mind when the property is purchased. The department then inspects and approves the plan for the mitigation site. Most projects use a combination of wetland restoration and creation. However, a small portion of each project may be preservation. For example, if a forested upland surrounds the project site, uplands may be counted toward mitigation. Under this informal program, the mitigation must be conducted in the same sub-basin as the impact or, under some circumstances, in an adjacent sub-basin. Progress is measured through evaluation of yearly monitoring reports, photos, and site visits according to the monitoring protocol developed by Interagency Mitigation Task Force in 1994. A recent meeting of the agencies developing the state wetland conservation plan was supportive of Maryland's consolidation program.[701]

There are several reasons why many permittees find these gray-area approaches less cumbersome than wetland mitigation banking or in-lieu-fee mitigation. For many states and localities, the MBRT process is perceived as time-intensive and requires the permittee to seek formal approval from a host of different agencies. Gray-area mitigation allows for a smaller group of agencies and individuals to approve a compensatory mitigation arrangement that is more specifically tailored to their individual situation. This might eliminate the need for one party to work with agencies or individuals that are known to or suspected to have a differing opinion on an issue integral to the management of the mitiga-

[699] National Research Council. Compensating for Wetland Losses Under the Clean Water Act. Washington: National Academy Press, 2001. 83.

[700] Army Corps of Engineers, Seattle district. Faxed survey response. 28 Nov. 2001.

[701] Maryland Department of the Environment. Telephone interview. 27 Feb. 2001.

tion project, or allow a party to mitigate for a very small or specific impact.

It is important to note that many regulatory agencies are wary of gray-area mitigation, and feel that has been used by permittees to evade regulations and procedures that are in place to ensure that permitted impacts are replaced. Many fear that gray-area mitigation provides unregulated and less effective mitigation than that offered by wetland mitigation banking or in-lieu-fee mitigation.

## GRAY-AREA IN-LIEU-FEE MITIGATION

The in-lieu-fee programs in the New Orleans district demonstrate the difficulty in accurately categorizing some mitigation projects. When approved by the Corps, the 16 in-lieu-fee programs in the New Orleans district were categorized as "consolidated mitigation areas." Under these programs, landowners received money from wetland mitigation applicants and once sufficient funds had been accumulated, the landowner completed the mitigation project. Following issuance of the 2000 in-lieu-fee guidance, these consolidated mitigation programs came under review. They were determined to be in-lieu-fee programs since mitigation does not occur in advance of permitted impacts and the programs did not go through the MBRT process for approval. The consolidated mitigation areas have since been reclassified as in-lieu-fee programs.

Several mitigation projects are difficult to classify as they operate as both wetland mitigation banks and in-lieu-fee programs. For example, Florida's Hole in the Donut restoration project in the Everglades National Park operates as both a bank and an in-lieu-fee program.[702] Hole in the Donut is permitted as a mitigation bank but it operates more like an in-lieu-fee program. Restoration conducted at the bank generally occurs following permitted impacts and permittees pay a fee to the Dade County Freshwater Wetlands Mitigation Trust Fund in-lieu of conducting permittee-responsible mitigation.

Louisiana has also approved 40-50 sites defined as "mitigation areas." The New Orleans Corps district has not maintained good records of the number of these sites that have been approved. Louisiana's mitigation areas have banking instruments that have been approved by a mitigation area review team. The authorizing instruments include performance standards, a management plan, long-term maintenance and protection, and financial assurances. The mitigation areas operate similarly to mitigation banks but differ in that the sponsor provides a mitigation site but does not undertake the mitigation until receiving funds from a permittee. Thus, mitigation occurs after the permitted impacts at these mitigation areas. In the future, these mitigation areas will be classified as in-lieu-fee projects.

## AD HOC IN-LIEU-FEE MITIGATION

Many Corps districts and state regulatory agencies authorize permittees to make cash donations on an ad hoc basis to satisfy their compensatory mitigation obligations.[703] In many cases, the ad hoc cash donations may be made in combination with other forms of compensatory mitigation, such as on-site, permit-specific off-site, mitigation bank, or in-lieu-fee program.[704] The mitigation may be carried out by the regulatory agency, a non-profit organization, or another entity. These donations are not technically considered in-lieu-fee mitigation programs because no formal agreement between the Corps and the entity accepting the fee is in place.[705] It is not clear what design or performance criteria the recipient of the cash donation must meet.[706] These ad hoc cash donations shift the legal responsibility for site conditions from the permittee to the recipient of the funds, but they lack the formal protective measures of those formalized in-lieu-fee programs with such safeguards.[707]

Ad hoc in-lieu-fee transactions are often not consistently documented, thus making it difficult to ensure that the mitigation was actually implemented. Sixteen of the 38 Corps districts reported accepting ad hoc in-lieu fees in interviews conducted as part of this study.[708] In addition, 16 states reported that ad-hoc fees had been accepted within their borders.[709] In the vast majority of these districts and states, no records were maintained to document these in-lieu-fee transactions.

[702] Department of Environmental Protection Permit Number 132416479.

[703] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act*. Washington, D.C.: National Academy Press, 2001. 87.

[704] Brumbaugh, Robert. Personal correspondence. 20 Aug. 2002.

[705] *Id.*

[706] *Id.*

[707] *Id.* at 88.

[708] Fort Worth district, Galveston district, Jacksonville district, Los Angeles district, Louisville district, Mobile district, New York district, Omaha district, Portland district, Rock Island district, Sacramento district, San Francisco district, Savannah district, Seattle district, Vicksburg district, and Walla Walla district.

[709] Arizona, Arkansas, Delaware, Florida, Indiana, Iowa, Kansas, Louisiana, Mississippi, Montana, Nebraska, Ohio, Utah, Washington, West Virginia, and Wisconsin.

# IX. THE FUTURE OF WETLAND MITIGATION BANKING AND IN-LIEU-FEE MITIGATION

## THE EFFECT OF THE SWANCC DECISION ON WETLAND MITIGATION BANKING

The question of what waters the Corps may regulate under §404 of the Clean Water Act has always been a contentious one—particularly the question of whether or not the Corps has jurisdiction over isolated waters, or those wetlands that are not directly adjacent to a waterbody. Section 404(a) of the Clean Water Act authorizes the Corps to issue permits "for the discharge of dredged or fill material into the navigable waters at specified disposal sites."[710] The term "navigable waters" is defined under the Act as "the waters of the United States, including the territorial seas."[711] After initially construing the Act to cover only waters navigable in fact, in 1975, the Corps issued interim final regulations redefining "the waters of the United States" to include not only actually navigable waters but also tributaries of such waters, interstate waters and their tributaries, and non-navigable intrastate waters whose use or misuse could affect interstate commerce.[712] The Corps later construed the Act to cover all freshwater wetlands that were adjacent to other jurisdictional waters of the United States.[713]

In 1986, the Corps issued the "Migratory Bird Rule," which the Corps claimed was necessary to clarify the extent of §404 jurisdiction.[714] The Rule claimed that CWA jurisdiction under §404(a) extended, in part, to intrastate waters "(a) which are or would be used as habitat by birds protected by Migratory Bird Treaties; or (b) which are or would be used as habitat by other migratory birds which cross state lines…"[715]

In 2001, The U.S. Supreme Court ruled on a wetland case that could have serious implications for the field of compensatory mitigation. In *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers* (*SWANCC*),[716] the Supreme Court addressed the issue of whether the Corps had the authority to regulate discharges of fill material into wetlands that are not adjacent to bodies of open water.[717]

The Supreme Court began its analysis by examining and distinguishing the SWANCC case from an earlier case, *U.S. v. Riverside Bayview Homes, Inc.*[718] In *U.S. v. Riverside Bayview Homes, Inc.,*[719] the Supreme Court held that "a definition of 'waters of the United States' encompassing all wetlands adjacent to other bodies of water over which the Corps has jurisdiction is a permissible interpretation of the Act."[720] However, the Court had expressly left open the question of whether the Corps had the authority to regulate discharges of fill into isolated wetlands.[721]

In the *SWANCC* decision, the majority acknowledged that in *Riverside Bayview* it held that "the term 'navigable' was of 'limited import' and that Congress showed its intent to 'regulate at least some waters that would not be deemed 'navigable' under the classical understanding of that term."[722] However, the Court distinguished *SWANCC* from *Riverside Bayview* since in *Riverside Bayview*, the wetlands at issue were adjacent to the navigable waters and not isolated as in *SWANCC*.

In *SWANCC*, the Justice Department argued that Congress, through its 1977 CWA amendments and through other legislative history, had intended to broaden the definition of "navigable waters" to the point where they would include isolated wetlands.[723] The Corps also argued that §404(g) of the CWA, which gave jurisdiction over "other waters" that were not navigable,

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[710] CWA §404(a); 33 U.S.C. §1344(a).
[711] CWA §502(7); 33 U.S.C. §1362(7).
[712] 40 Fed. Reg. 31320 (1975).
[713] 33 C.F.R. §209.120(d)(2)*(h) (1975).*
[714] 51 Fed. Reg. 41,206, 41,217 (November 13, 1986). The final rule stated "Many thought we were trying to reduce the scope of jurisdiction while others believed we were trying to expand the scope of jurisdiction. Neither is the case. The purpose was to clarify the scope of the 404 program by defining the terms in accordance with the way the program is presently being conducted." *Id.* at 41217.
[715] *Id.* at 41217. The final rule noted that the inclusion of migratory bird habitat as a basis for jurisdiction was a "clarification" from EPA. *Id.*
[716] 531 U.S. 159, 121 S.Ct. 675, 148 L. Ed. 2d 576 (2001) ("SWANCC").
[717] 531 U.S. at 167.
[718] 474 U.S. 121, 106 S.Ct. 455, 88 L.Ed.2d 419 (1985).
[719] *Id.*
[720] 474 U.S. at 135.
[721] *Id.* at 131-32 n.8.
[722] 531 U.S. at 167.
[723] *Id.* 170-171.

validated the regulations.[724] The Court rejected these arguments, holding that the legislative history was inconclusive and did not support the Corps' position,[725] and that §404(g) could be interpreted both for and against the Corps, and so was not a basis for upholding the rule.[726]

The Corps also argued that the Courts should defer to the regulatory agency interpretation, and therefore, their determination of jurisdiction. The majority rejected the argument for deference, finding that the Corps' interpretation of the statute raised "significant constitutional and federalism questions", and thus a clear indication from Congress was needed to uphold their interpretation.[727]

Thus far, the EPA and Corps' response has been cautious. Shortly after the *SWANCC* decision, EPA's Office of General Counsel along with the Corps jointly issued a memo discussing its interpretation of the case.[728] The memo focused on the fact that the *SWANCC* decision did not overrule *Riverside Bayview* and quoted several portions of *Riverside Bayview* that had not been overruled.[729] The memo also emphasized the portions of CWA jurisdiction that were unaffected by *SWANCC*.[730] However, the memo noted that in cases that were affected or could possibly have been affected by *SWANCC*, EPA and Corps personnel were instructed to consult legal counsel.[731]

The result has been that the Corps' policy is to have decisions on whether wetlands are isolated to be made at the district office level. There currently is no national Corps guidance on isolated wetlands, and so Corps offices have been making decisions on an ad hoc basis.[732] Until national guidance is issued from the Corps, EPA, and other affected agencies, wetlands mitigation bankers must consult with their local Corps office for guidance. The fact that there has been no national guidance for federal policy has made CWA implementation tricky, as the ultimate decision filters down to individual regulatory personnel inside each Corps district office.

While leaving untouched the Corps and EPA's jurisdiction over wetlands adjacent to navigable waters and tributaries, the Court created considerable uncertainty as to federal jurisdiction over isolated wetlands. In subsequent cases, courts have taken varying approaches with the *SWANCC* case, with several district courts attempting to find a jurisdictional nexus, especially to tributaries of navigable waters, to grant federal jurisdiction over wetlands adjacent to these waters.[733] Other courts have construed *SWANCC* narrowly, as only invalidating the migratory bird rule.[734] The Fifth Circuit has taken the most expansive view of any reviewing court, focusing on the Court's emphasis on navigation and adjacency.[735]

In the end, this means that in some areas of the country there will be less demand for compensatory wetland mitigation, and therefore less wetland mitigation banking. In states such as California and Florida with comprehensive wetlands laws, it is likely that such effect will be minimal because new development projects affecting wetlands will require mitigation. In other states, it is likely that the effect will be greater if wetlands not deemed jurisdictional by the Corps are not regulated under state and local statutes.[736] For the near future, the lack of federal guidance combined with uncertainty in the law will likely hamper wetland mitigation bankers' efforts to both attract business from developers impacting wetlands and to establish new banks.

In July 2002, the U.S. House of Representatives and the Senate introduced legislation that would reestablish the Clean Water Act's jurisdiction over isolated and non-navigable waters.[737] The companion bills, supported by the nation's major environmental organizations, would adopt a statutory definition of "waters of the United States" that would refer to all waters, "including wetlands adjacent to bodies of water and other wetlands and waters often referred to as isolated."[738] The bill would also delete the term "navigable" from the act.

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[724] *Id.* at 171.
[725] *Id.* at 170.
[726] *Id.* at 172.
[727] 531 U.S. at 172, *citing Edward J. DeBartolo Corp v. Florida Gulf Coast Building & Const. Trades Council,* 485 U.S. 568 (1988) and 531 U.S. at 173, *quoting* 33 U.S.C. 1251(b).
[728] Guzy, Gary S. and Robert Anderson. Memorandum to EPA and Corps managers and staff. 19 January 2001. See <http://www.epa.gov/owow/wetlands/swancc-ogc.pdf>.
[729] *Id.* at 2-4.
[730] *Id.*
[731] *Id.* at 4-7.
[732] See *id.*
[733] *U.S. v. Buday*, 138 F. Supp. 2d 1282 (D. Mont. 2001); *Headwaters, Inc. v. Talent Irrigation District*, 243 F.3d 526 (9th Cir. 2001).
[734] *U.S. v. Interstate General Co.*, 152 F. Supp. 2d 843 (D. Md. 2001).
[735] *Rice v. Harken Exploration Co.*, 250 F.3d 264 (5th Cir. 2001).
[736] See Kusler, Jon. "The SWANCC Decision and State Regulation of Wetlands." Association of State Wetland Managers. <http://www.aswm.org/fwp/swancc/aswm-int.pdf>.
[737] H.R. 5194, the "Clean Water Authority Restoration Act of 2002" was introduced by Rep. Oberstar on July 24, 2002. The bill was referred to the House subcommittee on Water Resources and the Environment on July 26, 2002. U.S. 2780, which goes by the same title, was introduced by Sen. Feingold on July 24, 2002. The bill was referred to the Committee on Environment and Public Works on the same day.
[738] H.R. 5194, §2 (8).

## RECENT PROPOSED BANKING LEGISLATION: AMERICAN WETLAND RESTORATION ACT

Because reauthorization of the Clean Water Act has been stalled in Congress for over a decade, a separate, stand-alone wetland mitigation banking bill has been introduced several times. Introduced by Rep. Walter Jones (R-NC), the American Wetland Restoration Act was crafted to foster wetland mitigation banking as a means to compensate for permitted wetland losses under §404 of the CWA.[739] The proposed legislation, while codifying the 1995 banking guidance, does differ in a number of aspects.

A number of national environmental organizations registered their opposition to the bill in 1998 on the grounds that it "promotes mitigation banking as an end in itself" and that sequencing requirements are not "properly safeguarded."[740] The bill also fails to include provisions to ensure that banks provide functional equivalency, such as including ecological performance standards and enforcement provisions in banking instruments. In addition, the bill would relax the provision in the 1995 guidance that preservation be used only in "exceptional circumstances." Finally, the bill would allow banks to sell up to 100 percent of their credits as soon as the Corps charters the bank.

## THE FUTURE OF IN-LIEU-FEE MITIGATION

The 2000 in-lieu-fee guidance expresses a preference for the use of mitigation banks over the use of an in-lieu-fee program.[741] This preference may inhibit the establishment of new in-lieu-fee programs and diminish activity at existing programs. Three Corps districts, Alaska, Buffalo, and Chicago, reported that the in-lieu-fee programs in their districts had effectively ended after the release of the federal guidance, as their in-lieu-fee programs did not meet the guidance standards.

States and local entities may, however, pass legislation to establish new in-lieu-fee programs that require mitigation for impacts below §404 thresholds. On the other hand, legislation can also limit in-lieu-fee programs. For example, in the Louisiana state in-lieu-fee program, the amount of in-lieu fees has dropped significantly since last year when a law was passed providing that in-lieu fees can be used only when there are no other mitigation options available in the coastal zone.

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[739] The bill, H.R. 1474, was introduced in the 107th Congress and referred to the House Committee on Transportation and Infrastructure on April 4, 2001, which referred it to the Subcommittee on Water Resources and Environment on April 4, 2001. Subcommittee hearings were last held on September 20, 2001. During the 106th Congress, the bill was introduced as H.R. 1290 in March 1999 and as S. 2948 in July 2000.

[740] American Oceans Campaign, Center for Marine Conservation, Chesapeake Bay Foundation, National Audubon Society, National Wildlife Federation, Natural Resources Defense Council, Sierra Club. June 2, 1998. Letter to Water Resources Subcommittee.

[741] U.S. Department of the Army, U.S. Environmental Protection Agency, U.S. Department of Interior, and U.S. Department of Commerce. *Federal Guidance on the Use of In-Lieu-Fee Arrangements for Compensatory Mitigation under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act*. 2000. 66915.

# X. CONCLUSIONS

Compensatory mitigation aims to mitigate for permitted wetland impacts. Off-site mitigation, whether wetland mitigation banking, in-lieu-fee mitigation, or project-specific off-site mitigation, is based on the premise that in some instances compensatory mitigation is not practicable at the site or there may be ecologically better ways of providing compensatory mitigation for wetland conversions than on-site mitigation. Many governmental officials, developers, and environmentalists acknowledge that these off-site mitigation methods can offer ecological benefits. However, there is little consensus about how banking and in-lieu-fee programs should be structured and administered.

Findings from this study provide a basis for establishing and implementing more effective and uniform standards for off-site compensatory wetland mitigation —in particular, wetland mitigation banking and in-lieu-fee mitigation. This study did not address on-site mitigation or permittee-responsible off-site mitigation. As such, the conclusions and recommendations that follow do not address these forms of compensatory mitigation. This chapter summarizes some of the major findings and associated recommendations of ELI's two-year study.

## THE PREFERENCE FOR WETLAND MITIGATION BANKING AND THE TIMING OF CREDIT RELEASE

Wetland mitigation banking is defined as mitigation "*in advance of development actions.*"[742] Early credit release, however, is a defining component of wetland mitigation banking. As many as 92 percent of the nation's banks allow credits to be withdrawn from a mitigation bank in advance of bank maturity. On average, banks allow for the advance debiting of 66 percent of credits prior to attaining final performance criteria and 42 percent of credits prior to achieving any performance criteria.

- State and federal policies should not favor wetland mitigation banking over other forms of compensatory mitigation *on the basis of banking's ability to provide mitigation in advance of development actions.* Although wetland mitigation banking may hold some advantages over other forms of compensatory mitigation, the claim that one of those advantages is the ability of banking to provide mitigation in advance of impacts is not supported in practice in the majority of cases.
- Early credit release can be supportive of ecologically viable compensatory mitigation provided that no credits are released until the banking instrument is approved, financial assurances are secured, oversight and long-term management procedures are solidified, a mechanism for legal protection of the site is in place, and some performance criteria are met. Federal and state regulatory agencies should set a maximum percentage of credits that can be released prior to meeting all performance standards to reduce the risks associated with a bank not providing all of its intended functions. For example, banks in Oregon and Illinois do not allow the release of more than 30 percent of their credits prior to meeting all performance standards.[743]
- Regulatory agencies should increase mitigation ratios by at least 50 to 100 percent if credits are to be sold prior to meeting performance standards. As performance standards are met, the replacement ratios should be diminished accordingly.
- The timing of credit release should be tied to the realization of performance standards rather than to a construction schedule or design criteria.

(See sections III. "Defining and determining wetland currency" and IV. "Credit release.")

## COMPENSATORY MITIGATION METHODS

The majority of wetland mitigation banks and in-lieu-fee mitigation projects employ multiple compensatory mitigation methods. Although restoration is a central component of banks and in-lieu-fee mitigation, enhancement, creation, and preservation are equally prevalent. In practice, preservation is common and is not being treated as a mitigation method to be used only in "exceptional circumstances." Of the 143 miti-

[742] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995. Emphasis added.

[743] Or. Admin. R. 141-085-0430; Ill. Admin. Code tit. 17, §1090.70(d).

gation banks that provide information on the wetland mitigation methods employed, 62 percent conduct restoration activities, 65 percent conduct enhancement activities, 45 percent conduct creation activities, and 44 percent conduct preservation activities. At least five banks provide credits through preservation alone. Of the 60 active in-lieu-fee programs with available documentation on mitigation methods, 95 percent allow restoration, 62 percent allow creation, 75 percent allow enhancement, and 88 percent allow preservation.

- For all forms of compensatory mitigation, regulatory agencies should maintain the preference for wetland restoration over creation and enhancement and allow credits for wetland preservation only in truly exceptional circumstances.
- Mitigation ratios should be higher to compensate for the shortcomings of creation and enhancement, and quite high where preservation is recognized. For example, Oregon requires a creation ratio of 1.5:1 and enhancement ratio of 3:1.[744] Michigan requires a preservation ratio of 10:1.[745]
- If creation, enhancement, or preservation are components of a bank or in-lieu-fee project, a substantial portion of the site's acreage should be devoted to restoration, in order to improve mitigation success and promote no net loss of wetland functions and acres.

(See sections III. "Mitigation methods," and IV. "Mitigation methods in use," and VII. "Use of in-lieu-fee funds.")

## PUBLIC ACCESS AND TRANSPARENCY

To date, with the exception of a few Corps districts and states that provide banking instruments and other documentation on their web sites, the public has very little access to information on banking, in-lieu-fee mitigation, and other forms of compensatory mitigation.[746]

- Federal and state regulatory agencies should improve the accessibility of information on compensatory mitigation and the transparency with which decisions on compensatory mitigation are made.
- Federal and state agencies should institute a public comment process for proposed wetland mitigation banks and in-lieu-fee programs.
- Federal and state agencies should require greater accountability from wetland mitigation banking and in-lieu-fee programs for the ecological effectiveness of the mitigation performed.

Although banking instruments routinely indicate that the wetland classification system developed by Cowardin (1979) will be used to define wetland type, they often fail to do so. Descriptions of wetland types in banking instruments are generally not uniform and are often inadequate.

- Banking and in-lieu-fee programs and authorizing instruments should adopt and apply a uniform wetland classification system to indicate the wetland types impacted and those replaced through compensatory mitigation. This will improve the ability of the public and regulatory agencies to determine whether in-kind mitigation is being met and if not, the degree to which specific wetland types may be disproportionately impacted.

(See sections III. "The role of the public" and IV. "Wetland types available for crediting.")

There is considerable variation among mitigation bank authorizing instruments, among umbrella bank authorizing instruments, and among the authorizing instruments for in-lieu-fee programs. This inconsistency inhibits the ability of the public and regulatory agencies to compare banks or programs and to evaluate whether the necessary components are included in the agreements.

- The Institute for Water Resources' 1996 paper, "National Wetland Mitigation Banking Study: Model Banking Instrument," should be used by Corps district offices and state and local wetland mitigation banking programs to guide the development of banking instruments.[747] Banking programs should strive for a degree of uniformity among banking instruments and across Corps districts to improve the accessibility of information to the public and regulatory agencies.

(See section III. "Establishment of mitigation banks.")

## CREDIT SYSTEMS TO ENCOURAGE NO NET LOSS

Many wetland mitigation banks and in-lieu-fee programs employ creation, a mitigation method with a

[744] Or. Admin. R. 141-085-0135.

[745] Mich. Admin. Code r. 281.925.

[746] Only eight Corps districts provide information on the approved mitigation banks in their jurisdictions: Charleston, Chicago, Galveston, New Orleans (minimal), Norfolk, Portland, St. Louis, and Wilmington.

[747] Institute for Water Resources. *National Wetland Mitigation Banking study: Model Banking Instrument.* Alexandria, VA: Institute for Water Resources, U.S. Army Corps of Engineers, May 1996. IWR Technical Paper WMB-TP-1. *See also:* <http://www.iwr.usace.army.mil/iwr/pdf/wmb_tp1_May96.pdf>.

lower rate of success, and preservation, which does not contribute to the national no net loss goal. In addition, the vast majority of banks with upland acreage assign credits to these areas. Of the 90 banking instruments that indicate that uplands are present on the mitigation site, 99 percent include the acreage in the valuation of bank credits.

Banking instruments often require higher mitigation ratios for upland acreage and for certain wetland types or mitigation methods. Higher mitigation ratios may also be assigned when the impacted wetland is of "high quality," to reflect the magnitude of the impact, or for impacts that result in greater temporal loss of wetland functions. However, the practice of "tailoring" mitigation ratios to better meet the no net loss goal is inconsistent and may be insufficient to accommodate higher mitigation failure risks and the replacement of lost wetlands with non-wetland acreage.

- Regulatory agencies should consistently require higher mitigation ratios for mitigation methods that have lower rates of success (i.e., creation) or that do not contribute to the national goal of no net loss of wetlands (i.e., preservation). Where available, mitigation ratios should be based on science-based studies of the relative success of the different types of mitigation.
- Activities that do not produce wetland acreage or functions (i.e., the preservation or restoration of adjacent uplands) should not be assigned credits independent of associated wetlands credits. Assigning credit to upland acreage would presume that the area replaces lost wetland functions. However, since uplands may contribute to the overall ecological effectiveness of the mitigation site, those buying credits from banks or paying into an in-lieu-fee program should be required to purchase some credit for upland acreage in association with each required credit of wetland compensation that is purchased, or the ratios should be adjusted up ward to assure that uplands are not being used to mitigate for wetlands losses.
- Despite significant creation and restoration challenges, the second most common wetland type in banks is forested/scrub shrub wetlands, a wetland type that is difficult to replace. Regulatory agencies should consistently adjust mitigation replacement ratios to compensate for the mitigation of wetland types that are difficult to replace, take a long time to reach maturity or for impacts to rare or particularly large wetlands.
- Regulatory agencies should consistently apply higher mitigation ratios for out-of-kind mitigation and for out-of-service-area impacts.

(See sections III. "Defining and determining wetland currency," IV. "Credit release," and IV. "Wetland types available for crediting.")

## FINANCIAL ASSURANCES

Few in-lieu-fee programs require the posting of financial assurances prior to the collection of fees. Although the majority of today's mitigation banks have financial assurances for bank establishment, oversight, and long-term management, banks established by government agencies require few, if any, such assurances.

- Financial assurances should be required for all forms of wetland mitigation, regardless of the sponsor.
- Financial assurances should be more stringent for banks and in-lieu-fee sites that utilize mitigation methods with lower rates of success (i.e., creation), wetland types that are more difficult to replace, and projects that allow the advance sale of credits. Once the mitigation site is functionally mature, or as performance milestones are reached, financial assurances should be reduced accordingly.
- Some types of financial assurances may be easier for regulatory agencies to utilize in the case of site failure. Collecting some forms of bonds and financial assurances may be time consuming, difficult, and result in the recovery of less funding than is needed to take remedial action. Regulatory agencies should evaluate the record of effectiveness of different financial assurances in cases of site failure or underperformance. Guidance or model approaches should be offered.

(See sections III. "Financial assurances," IV. "Financial assurances for bank establishment," and VII. "Accountability.")

## PERFORMANCE STANDARDS

Almost a third of the authorizing instruments for in-lieu-fee programs and over a third of the instruments for wetland mitigation banks fail to specify required performance standards. Despite the importance of wetland hydrology, only a little over half of the banks with performance standards incorporate hydrologic criteria and very few include standards for water quality, soils, wildlife habitat, or other criteria, while 95 percent of all banks with performance standards include vegetative standards.

- All mitigation banks and in-lieu-fee sites should have clearly articulated, quantitative performance standards in their authorizing instruments. Performance standards should be scientifically defensible and should be based primarily on physical and ecological properties rather than on administrative or construction milestones.
- Well-articulated ecological performance standards should be used as milestones to define a bank or site's credit release schedule, mitigation ratios, level of required financial assurances, and the length of the monitoring period.
- Performance standards should measure the wide variety of wetland functions and values that the mitigation sites are expected to exhibit and replace. Performance standards should not be limited to a few, easily measured parameters, such as relying upon the structural characteristics of vegetation.[748]

## FUNCTIONAL ASSESSMENT OF WETLANDS

Although wetland experts have professed the advantages of using functional assessment techniques to evaluate lost wetland functions and define the number of mitigation credits available at a bank or the amount of mitigation necessary under an in-lieu-fee program, these approaches are used infrequently. Sixty-one percent of all banks define credits by acreage and about 23 percent of all banks have established a combined approach, which relies upon best professional judgment to scale wetland acreage according to some value of functionality.

- The definition of wetland credits should be based, at least in part, on functional assessment to ensure that lost wetland acres *and* functions are adequately replaced.
- Despite the absence of a commonly accepted, economically efficient, and technically streamlined functional assessment methodology that takes into account the wide variety of wetland functions and values, straight acreage measures and best professional judgment should not be relied upon as sole methods for assessing wetland credits. Regulatory agencies should determine whether the development and implementation of "science-based, rapid assess ment procedures"[749] is feasible in the short-term. If it is not, wetland mitigation banking and in-lieu-fee program mangers should be provided with guidance on an alternative method that combines acreage and some measure of functionality.
- Development of a full-fledged functional assessment methodology should, however, remain the goal and the standard to which mitigation credit definition is held.

(See sections III. "Defining and determining wetland currency," III. "Performance standards," IV. "Wetland valuation and crediting," IV. "Performance standards in practice," and VII. "Accountability.")

## DESIGN STANDARDS

Although 30 percent of all banks have adopted some form of design standards, no consensus exists for the type and range of information used to evaluate effective mitigation site design and construction.

- Design standards should be used as a further guarantee of mitigation performance rather than a substitute for performance criteria.
- To improve mitigation performance, both design standards and performance standards should be clearly detailed in the authorizing instrument and tied to credit release schedules and financial assurances.
- Although the development of prescriptive design standards is not encouraged, regionally tailored standards or minimum submission design standards can provide regulatory agencies with the ability to adequately evaluate proposed banks.

(See section IV. "Design standards.")

## ENFORCEMENT, REMEDIAL ACTION, AND CONTINGENCY PLANS

Enforcement actions for failed wetland mitigation banks were not found to be any more common or stringent than for other types of compensatory mitigation. Seventy-three percent of all banks have some form of contingency plans in the event of bank failure. However, the plans are inconsistent and often include only minimal information. Only 31 percent of the banks with contingency plans specify potential enforcement mechanisms. Seven in-lieu-fee programs do not provide any information on which party has legal responsibility for meeting mitigation obligations when the funds are collected. Half of the active in-lieu-fee program agreements are silent as to whether the sponsor has legal responsibility for completing the mitigation.

[748] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act*. Washington, D.C.: National Academy Press, 2001. 130.
[749] *Id.* at 136.

- Enforcement measures and steps to address the need for remedial action should be clearly articulated in all wetland mitigation banking, umbrella bank, and in-lieu-fee authorizing instruments. For example, many Georgia and South Carolina mitigation banks specifically outline remedial actions based on the anticipated deficiencies of the bank.
- The responsible party for enforcement, remedial actions, and the implementation of contingency plans should be clearly outlined in authorizing instruments.
- Remedial action and contingency plans, and the funds to implement them, should be clearly outlined in authorizing instruments.
- Enforcement, remedial action, and contingency provisions should be particularly stringent for mitigation projects that seek to mitigate wetland types that are difficult to replace.

(See sections III. "Enforcement measures and remedial action," IV. "Bank operation and oversight," IV. "Remedial actions and enforcement," and VII. "Accountability.")

## MONITORING AND LONG-TERM MANAGEMENT

Today, most wetland banking instruments include some reference to monitoring and maintenance provisions, although 14 percent do not. Of those banks with monitoring provisions, no bank is monitored for less than three years, but the majority (64 percent) only require monitoring for up to five years. Only 15 banks indicate that the length of the monitoring period is based on the final achievement of performance criteria.

Monitoring for in-lieu-fee mitigation is not required in the majority of the existing programs. Several in-lieu-fee programs do not require mitigation sites to be protected in perpetuity and only 76 percent of all mitigation banks indicate how the land will be protected.

- The mitigation sponsor's monitoring and maintenance requirements should be included in all wetland mitigation bank, umbrella bank, and in-lieu-fee authorizing instruments. Consistent disclosure of this information would allow regulatory agencies and the public to monitor compliance more effectively.
- The length of the monitoring period should be tied to the wetland type and the achievement of performance standards, rather than an arbitrarily set time frame.
- Provisions for long-term protection of mitigation sites should be clearly identified in all wetland mitigation bank, umbrella bank, and in-lieu-fee authorizing instruments.
- Mitigation banking instruments should clearly outline plans for the long-term ownership, management, and maintenance of the bank in a long-term management plan.

(See sections III. "Long-term management, monitoring," IV. "Bank operation and oversight," and VII. "Accountability.")

## GEOGRAPHIC SERVICE AREAS

Twenty-six percent of the active in-lieu-fee programs, including over half of the state-sponsored programs, do not have mandated delineated geographic service areas. While ninety-six percent of all mitigation banking instruments include information on service areas, virtually all banking instruments indicate that the bank may be debited outside of the service area on a case-by-case basis. These out-of-service-area trades are not adequately tracked by the regulatory agencies.

- The service areas for wetland mitigation banks, umbrella banks, and in-lieu-fee programs should be clearly defined by the relevant regulatory agencies and should be of an appropriate size to reasonably compensate for lost wetland functions.
- The discretion for out-of-service-area trade decisions should be minimized, the trades should be rare, and they should be compensated for by higher mitigation ratios. When these decisions are made, ecological factors should be among the primary is sues considered.
- Out-of-service-area trades should be closely tracked by the regulatory agencies to ensure that particular watersheds do not have excessive, cumulative impacts that are mitigated out-of-watershed.

(See sections III. "Bank siting considerations," III. "Compensatory mitigation and the watershed approach," IV. "Bank siting," IV. "Wetland mitigation bank geographic service areas," IV. "Wetland types available for crediting," VII. "Site selection," and VII. "In-lieu-fee program service areas.")

## THE WATERSHED APPROACH AND SITE SELECTION

Despite the support of watershed planning by both the scientific community and regulatory agencies, less than one percent of all banking instruments specifically

reference consistency with a watershed management plan. Only two states—Michigan and North Carolina—explicitly require in their banking statutes or regulations that mitigation sites be planned in a watershed context. Few in-lieu-fee programs are guided by a formal watershed plan.

Detailed siting criteria are generally not outlined in the majority of mitigation banking instruments and only ten states have statutes, regulations, or guidelines that outline bank siting criteria.

- Watershed planning holds great promise for improving the ecological effectiveness of all forms of compensatory mitigation. However, a misapplied watershed approach may "weaken the commitment during the permitting process to protect individual wetlands and the functions they provide, with existing wetlands being too readily traded for compensatory wetlands that might not be ecologically functional."[750] Thus, until it is rigorously administered and science-based, a watershed approach should not serve as a basis to dilute the current national policy, which prefers on-site and in-kind mitigation unless banking offers an "environmentally preferable" outcome.
- Regulatory agencies should develop national guidance to direct permit and mitigation decision-making based on the watershed approach. Innovative methods should be encouraged where appropriate accountability and transparency are central to the approach.
- Regulatory agencies should develop guidelines for mitigation site sponsors to identify ecologically suitable sites for compensatory mitigation. The criteria used for site selection should be clearly highlighted in authorizing instruments to enable the public and regulatory agencies to evaluate the appropriateness of proposed mitigation. Ideally, site selection would take place in the context of a regional watershed evaluation.
- Out-of-kind mitigation should not be discouraged if determined to be ecologically appropriate and preferable, and if it is based on a science-based watershed plan that has identified historical losses of particular wetland types or wetland functions that are scarce in the watershed.

(See sections III. "Bank siting considerations," III. "Compensatory mitigation and the watershed approach," IV. "Bank siting," and VII. "Site selection.")

[750] *Id.* at 144.

## IN-LIEU-FEE MITIGATION

Tracking data on in-lieu-fee funds is unavailable or incomplete for 45 percent of the nation's in-lieu-fee programs. Most of the programs that do not maintain complete records are administered by the Corps. Twenty-six percent of the active in-lieu-fee programs do not have mandated delineated geographic service areas. Only 22 percent of all in-lieu-fee program agreements specify the procedure or plan that the sponsor must establish and follow to select mitigation sites.

Only eight in-lieu-fee programs specify that they only provide in-kind mitigation. Sixty-five percent of the in-lieu-fee programs do not require that the collected funds be spent in a specific time frame. Nine in-lieu-fee programs verified that they have used collected funds for activities other than mitigation. In-lieu-fee programs currently fail to adequately document funds received, impacts permitted, how funds are spent, types of projects funded, and the status of projects conducted, making it difficult for the public and regulatory agencies to monitor the effectiveness of these programs.

- The 2000 in-lieu-fee guidance suggests that in-lieu-fee sponsors collect and submit specified information on their programs to the regulatory agencies. This information includes the funds received, impacts permitted, how funds are disbursed, types of projects funded, and the success of the projects. If submitted, this information would be sufficient to fulfill the information shortcomings of this compensatory mitigation approach. All Corps districts, and state and local agencies administering in-lieu-fee programs, should closely adhere to the 2000 guidance.
- To the extent required by other forms of compensatory mitigation, in-lieu-fee programs should be required to provide in-kind and in-service area mitigation for permitted impacts. Information on the types and location of impacted wetlands and mitigation sites should be collected and submitted to the regulatory agencies by the program sponsor. This will better enable the public and the regulatory agencies to monitor the ability of in-lieu-fee mitigation to achieve its desired goals.
- Regulatory agencies should develop guidelines for in-lieu-fee sponsors to use in identifying ecologically suitable sites for compensatory mitigation. The guidelines should specify the type and level of ecological information that should be provided prior to site approval. The criteria used for site selection should be clearly highlighted in the authorizing in

struments to enable the public and regulatory agencies to evaluate the appropriateness of proposed mitigation. Ideally, site assessment should take place in the context of a regional watershed evaluation.

- To minimize the lag time between when permitted impacts occur and when compensatory mitigation is completed, in-lieu-fee programs should be required to identify mitigation sites prior to accepting funds.
- In-lieu-fee authorizing instruments should specify the time frame in which collected funds must be spent and should specify a contingency plan if fees are not spent in the required timeframe.
- Regulatory agencies should increase mitigation ratios by at least 50 to 100 percent if in-lieu fees are to be accepted prior to mitigation sites meeting performance standards. As performance standards are met, the replacement ratios should be diminished accordingly.
- To minimize the lag time between when permitted impacts occur and when compensatory mitigation is completed, in-lieu-fee programs should establish a revolving loan fund. The capital from the fund should be used to establish mitigation areas in advance of the in-lieu-fee program accepting fees for permitted impacts. North Carolina's fund offers a promising model.
- In-lieu-fee funds should not be used for activities that do not contribute to the mitigation of wetlands, such as research, education, or planning.
- The amount charged to a permittee to participate in an in-lieu-fee program should accurately reflect the cost of the mitigation project, including a risk premium and long-term management.

(See sections III. "Bank siting considerations," VII. "Tracking in-lieu-fee activity," VII. "Site selection," VII. "Timing of in-lieu-fee mitigation," VII. "Use of in-lieu-fee funds," and box VII. "Reducing the lag time in North Carolina.")

## UMBRELLA MITIGATION BANK AGREEMENTS

Although the Corps' oversight role of umbrella mitigation banks appears, on the whole, adequate, in certain states the Corps provides very little oversight.

- The Corps, or other appropriate regulatory agency, should maintain consistent oversight of umbrella bank operation, particularly site selection, and the approval, modification, or rejection of proposed plans.

(See chapter V. "Umbrella instruments and multi-site banks.")

## GRAY-AREA AND AD HOC MITIGATION

Gray-area mitigation, or off-site mitigation other than mitigation banking, in-lieu-fee mitigation, or permittee-responsible off-site mitigation, is commonplace. Sixty percent of the Corps districts and 59 percent of the state regulatory agencies indicate that they have utilized this method of compensatory mitigation. Forty-two percent of the Corps districts have accepted ad hoc in-lieu fees and 32 percent of the states reported that ad-hoc fees had been accepted in their states. In the vast majority of these districts and states, no records have been maintained to document these in-lieu-fee transactions.

- The federal regulatory agencies should issue interagency guidance to formally regulate alternate forms of compensatory mitigation.
- Gray-area mitigation should be held to the same standards and requirements as other forms of compensatory mitigation. Methods that do not replace wetland functions should be expressly discouraged.
- Ad hoc in-lieu-fee mitigation should adhere to the 2000 in-lieu-fee guidance and should be held to the same standards as formal in-lieu-fee programs.

(See chapter VIII. "'Gray-area and ad hoc mitigation.'")

# *APPENDIX A: ACRONYMS*

CEQ – Council on Environmental Quality

Corps – U.S. Army Corps of Engineers

CWA – Clean Water Act

ELI – Environmental Law Institute

EPA – U.S. Environmental Protection Agency

FAC – facultative vegetation

FACW – facultative wetland vegetation

FHWA – Federal Highway Administration

FWS – U.S. Fish and Wildlife Service

GAO – General Accounting Office

HEP – Habitat Evaluation Procedures

HGM – Hydrogeomorphic Approach

ISTEA – Intermodal Surface Transportation Efficiency Act

IVA – Indicator Value Assessment

MBRT – Mitigation Banking Review Team

MOA – Memorandum of Agreement

MOU – Memorandum of Understanding

MWRAP – Modified Wetlands Rapid Assessment Procedure

NEPA – National Environmental Policy Act

NMFS – National Marine Fisheries Service

NOAA – National Oceanic and Atmospheric Administration

NRC – National Research Council

NRCS – Natural Resources Conservation Service

OBL – obligate wetland vegetation

RE – reference ecosystem

RGL – Regulatory Guidance Letter

SBI – supplemental bank instrument

SWANCC – Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers

TEA-21 – Transportation Equity Act for the 21st Century

USDA – U.S. Department of Agriculture

USGS – U.S. Geological Survey

WEM – Wetland Evaluation Methodology

WET – Wetland Evaluation Technique

WHAP – Wildlife Habitat Appraisal Procedure

WRAP – Wetlands Rapid Assessment Procedure

# APPENDIX B: GLOSSARY OF TERMS

**Active in-lieu-fee program**
An agreement between a regulatory entity and a sponsor that has been approved by the parties to collect funds and provide compensatory mitigation. The sponsor may not yet have collected funds but is approved to do so.

**Ad hoc in-lieu-fee mitigation**
An arrangement between a Corps district or state wetland regulatory agency allowing a permittee to make a cash donation without a formal agreement to satisfy their compensatory mitigation obligations. The mitigation may be carried out by the regulatory agency, a non-profit organization, or another entity.

**Approved-active bank**
An approved bank that is authorized to sell credits.

**Approved-inactive bank**
An approved bank that is currently not authorized to sell credits due to a failure to meet performance goals, the expiration of financial assurances, or other such factors.

**Approved-sold-out bank**
An approved bank that has sold all of its credits.

**Banking guidance**
"Federal Guidance for the Establishment, Use and Operation of Mitigation Banks," an agreement between the Corps, EPA, FWS, NRCS, and NOAA, published in the Federal Register in November 1995. Also known as *1995 guidance*.

**Best Professional Judgement**
A case-by-case assessment made by a professional familiar with a background in wetland science.

**Bog**
A peat-accumulating wetland that has no significant inflows or outflows and will support acidophilic mosses, particularly sphagnum.

**Casualty insurance**
Insurance that is primarily concerned with losses caused by injuries to persons and legal liability imposed upon the insured for such injury or for damage to the property of others.

**Client**
The entity or entities whose activities will create a permitted wetland impact for which mitigation is being sought through a bank or in-lieu-fee program.

**Combination public-private commercial bank**
A bank established by a combination of public and private agencies to compensate for permitted wetland losses. Credits may be available to public agencies or to the general public.

**Compensatory mitigation**
The restoration, creation, enhancement, or in exceptional circumstances, preservation of wetlands and/or other aquatic resources for the purpose of compensating for unavoidable adverse impacts.

**Completed in-lieu-fee sites**
In-lieu-fee mitigation sites where construction has been completed, though the site may still be under monitoring requirements.

**Construction in-lieu-fee sites**
In-lieu-fee mitigation sites where construction has been started on the site but is not yet completed.

**Corps-administered in-lieu-fee program**
An in-lieu-fee program approved by and administered by the Corps.

**Creation**
The establishment of a wetland or other aquatic resource where one did not formerly exist.

**Credit**
The standard unit of measurement for quantifying the net gain in wetland acreage or function that results from wetland restoration, enhancement, creation, or preservation.

**Debit**
The standard unit of measure for quantifying wetland disturbance or loss.

**Design standards**
Predetermined requirements or specifications, physical or biological, for how a wetland site is to be constructed or mitigated (e.g., specifications related to planting schemes or hydrologic engineering). Also *design criteria*.

**Enhancement**
Activities conducted in existing wetlands or other aquatic resources that increase one or more aquatic functions.

**Entrepreneurial bank**
A bank sponsored by a private entrepreneur with credits available for sale on the open market. Clients for such banks may include public or private entities. Also a *private commercial bank*.

**Escrow account**
A predetermined amount of money that the bank sponsor places into a bank account to be held until performance standards or other milestones are met.

**Expired bank**
A bank that has been formally approved by the appropriate agency, but is never constructed and has not generated credits for sale.

**Fen**
A peat-accumulating wetland that receives some drainage from surrounding mineral soil and usually supports marsh-like vegetation.

**Financial assurances**
Financial promises from a sponsor to cover expenses if a bank or in-lieu-fee site should fail to meet the requirements of its authorizing instrument. These may take many forms, inluding performance bonds, irrevocable trusts, escrow accounts, casualty insurance, letters of credit, and legislatively enacted dedicated funds for government operated banks.

**Functional Equivalency**
An established assessment methodology designed to measure one or more wetland functions or services.

**Functions**
Those services that wetland perform, regardless of how these services are valued by society.

**General use public bank**
A bank sponsored by public entities to compensate for wetland losses caused by a combination of public works projects and private development. Also a *public commercial bank*.

**Gray-area mitigation**
Off-site compensatory mitigation that cannot be characterized as wetland mitigation banking (under a mitigation banking instrument or an umbrella instrument), in-lieu-fee mitigation, or off-site permittee-responsible mitigation. Often referred to as consolidated banking, pooled mitigation, or mitigation fees.

**Hydric soil**
Soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part of the soil.

**In-lieu-fee mitigation**
Mitigation that occurs in circumstances 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.

**In-lieu-fee program**
An agreement between a regulatory agency (state, federal, or local) and a single sponsor, generally a public agency or non-profit organization, whereby the mitigation sponsor agrees to undertake in-lieu-fee mitigation.

**In-kind compensation**
The restoration, creation, enhancement, or preservation of a wetland type similar to that of the impacted wetland.

**Invasive species**
A species that is non-native (or alien) to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health.

**Irrevocable trust**
A trust which may not be revoked after its creation, as in the case of a deposit of money by one in the name of another as trustee for the benefit of a third person (beneficiary).

**Joint project bank**
A bank established by two or more public agencies or combinations of public and private agencies expressly to compensate for the permitted wetland losses attributed to their activities.

**Jurisdictional wetland**
A wetland that meets the legal definition of a wetland under the Clean Water Act or Swampbuster and is thereby under the jurisdiction of the Corps for regulatory purposes.

**Landscape**
A mosaic where several attributes - such as geologic land forms, soil types, vegetation types, local faunas, natural disturbance regimes, land uses, and human aggregation patterns - tend to be similar and repeated across the whole area.

**Letter of credit**
An engagement by a bank or other person made at the request of the bank sponsor that the issuer will honor drafts or other demands for payment upon compliance with the conditions specified in the credit.

**Locally-administered programs**
An in-lieu-fee program administered primarily by a local entity, such as a county government.

**Long-term property owner**
The agency or organization that holds fee title to the bank or in-lieu-fee site.

**Maintenance**
Actions taken by the sponsor or other entity to assure that the bank or in-lieu-fee site meets performance criteria or other goals.

**Mitigation banking instrument**
The document that outlines the physical and legal characteristics of the establishment, operation, and maintenance of the wetland mitigation bank.

**Mitigation Banking Review Team (MBRT)**
The team established to facilitate the establishment of mitigation banks through the development of mitigation banking instruments. The Corps generally serves as Chair and typically, the U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, and state and local regulatory resource agencies serve on the MBRT. The National Marine Fisheries Service, Natural Resources Conservation Service, and tribal regulatory agencies may also participate.

**Mitigation MOA**
The MOA signed in 1990 between the EPA and the U.S. Department of the Army to clarify the protocol for determining the type and level of mitigation required under the §404(b)(1) guidelines. Also *1990 MOA*.

**Mitigation replacement ratio**
The number of units of credit (functional units or acres) which must be debited from a bank or in-lieu fee program in order to compensate, or replace, one unit of wetland which is expected to be lost. Also *compensation ratios* or *debiting ratios*.

**Monitoring**
The act of measuring bank or in-lieu-fee site conditions and comparing them to either set performance criteria or reference wetlands.

**On-site mitigation**
Compensatory mitigation undertaken in areas adjacent or contiguous to the discharge site.

**Out-of-kind compensation**
The restoration, creation, enhancement, or preservation of wetlands that are of a different type than that of the wetland being impacted.

**Pending bank**
A bank with a prospectus that has been submitted to the appropriate agency for review and approval.

**Pending in-lieu-fee program**
A proposed agreement between a regulatory entity and sponsor that has not yet been approved by the regulatory agency to collect funds and conduct mitigation.

**Pending in-lieu-fee sites**
Mitigation sites that have been proposed but are not yet approved.

**Performance bond**
A bond purchased by the credit producer from a third party surety to ensure that the site functions properly for the specified period and that all necessary corrective actions will be taken. Once the period has ended and performance has been met, the bond is released. The bond can also be released in stages as different milestones are reached.

**Performance criteria**
Criteria often outlined in a banking instrument or in-lieu-fee agreement to link ecological performance, or stages of ecological performance, to requirements for financial assurances, the timing of credit release, and monitoring periods. They are often expressed as measurable performance standards.

**Performance standards**
Observable or measurable attributes used to evaluate whether a compensatory mitigation project is in compliance with the terms and conditions set forth in authorizing instruments. Also *success criteria* or *release criteria*.

**Permittee**
The entity or entities whose activities will result in a permitted wetland impact for which mitigation is being sought through a bank or in-lieu-fee program.

**Permitting agency**
The regulatory entity with jurisdiction over impacts to wetlands and the agency that makes determinations about whether a proposed project will be issued a permit, and therefore whether wetland impacts will occur.

**Preservation**
The protection of ecologically important wetlands or other aquatic resources in perpetuity through the implementation of appropriate legal and physical mechanisms. Preservation may include protection of upland areas adjacent to wetlands as necessary to ensure protection and/or enhancement of the aquatic ecosystem.

**Prior converted cropland**
Agricultural land with hydric soil that was planted to a crop at least once between 1983 and 1985 and was previously drained at an intensity consistent with the local NRCS standards.

**Private commercial bank**
A bank sponsored by a private entrepreneur with credits available for sale on the open market. Clients for such banks may include public or private entities. Also an *entrepreneurial bank*.

**Program sponsor**
Often a state agency, land trust, or conservation organization that agrees to complete in-lieu-fee mitigation projects to satisfy the mitigation requirements created by the permittee's impacts.

**Public commercial bank**
A bank sponsored by public entities to compensate for wetland losses caused by a combination of public works projects and private development. Also a *general use public bank*.

**Reference wetland**
A wetland site that encompasses known variation in the functioning of the subclass of wetlands. Reference wetlands are used to establish the range of functioning within the subclass.

**Restoration**
Re-establishment of wetland and/or other aquatic resource characteristics and function(s) at a site where they have ceased to exist, or exist in substantially degraded state.

**Riparian zone**
Zone immediately adjacent to streams, which is occasionally flooded but otherwise dry for varying portions of the growing season.

**Sequencing guidelines**
Permit review process for mitigation that involves the consideration of mitigation in three steps: (1) avoidance of the impact, (2) minimization of any unavoidable impacts, and (3) compensation for any remaining impacts.

**Service area**
The area (e.g., watershed, county) in which a bank or in-lieu-fee site may provide compensation for impacts to wetlands. Also *designated area* or *designated service area*.

**Single-client single-user bank**
A bank for which the sponsor is also the principal credit user or client.

**Sponsor**
The entity, usually a government agency or private entrepreneur, that is responsible for credit production. Bank and in-lieu-fee sponsors produce wetland credits on a specific site or sites by any of the accepted methods.

**State-administered programs**
An in-lieu-fee program administered primarily by a state agency.

**Swampbuster**
A program enacted by Congress under the 1985 Food Security Act that can require mitigation for some agricultural activities affecting wetlands and makes farmers ineligible for certain federal farm program benefits, such as price support or payment and loans, if they fill a wetland to plant commodity crops.

**Umbrella agreement**
Banking instruments sponsored by a single entity to establish and operate a regional banking program with multiple bank sites. Also an *umbrella banking instrument*.

**Umbrella bank**
A regional banking program with multiple bank sites sponsored by a single entity.

**Values**
Those services that wetland perform that are considered beneficial to society.

**Vernal pool**
A shallow, intermittently flooded wet meadow that is generally dry for most of the summer or fall.

**Watershed**
The land area that drains into a stream, river, or other body of water.

**Wetland mitigation banking**
Wetland restoration, creation, enhancement, and in exceptional circumstances, preservation undertaken expressly for the purpose of compensating for unavoidable wetland losses in advance of development actions, when such compensation cannot be achieved at the development site or would not be as environmentally beneficial.

# APPENDIX C: LIST OF WETLAND MITIGATION BANKS, UMBRELLA AGREEMENTS, AND IN-LIEU-FEE MITIGATION PROGRAMS BY STATE

Below are wetland mitigation banks, umbrella agreements, and in-lieu-fee programs in the country are presented by state and further grouped by Corps district. The status of each bank and each umbrella agreement is listed as approved-active, approved-inactive, approved-soldout, expired, or pending. An **approved-active bank or agreement** is an approved bank or agreement that is authorized to sell credits. An **approved-soldout bank or agreement** is an approved bank or agreement that has sold all of its credits. An **approved-inactive bank or agreement** is an approved bank or agreement that is currently not authorized to sell credits due to a failure to meet performance goals, the expiration of financial assurances, or other such factors. A **pending bank or agreement** is a bank or agreement with a prospectus that has been submitted to the appropriate agency. An **expired bank or agreement** is a bank or agreement that has been formally approved by the appropriate agency but is never constructed and has not generated credits for sale. The status of each in-lieu-fee program is listed as approved or pending. An **active in-lieu-fee program** is an agreement between a regulatory entity and a sponsor that has been approved by the parties to collect funds and provide compensatory mitigation. The sponsor may not yet have collected funds but is approved to do so. A **pending in-lieu-fee program** is a proposed agreement between a regulatory entity and sponsor that has not yet been approved by the regulatory agency to collect funds and conduct mitigation. Missing fields indicate information that was unavailable at the time of data collection. Information is current through December 2001.

**Alabama**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| Mobile | Alabama Highway Department/Wheeler Wildlife Refuge | Expired |
| Mobile | Alabama Port Wetland Bank | Pending |
| Mobile | Boykin-Lillian Wetland Mitigation Bank | Approved-Active |
| Mobile | McLemore Mitigation Bank | Pending |
| Mobile | Weeks Bay Mitigation Bank | Approved-Active |
| Nashville | Flint Creek Wetland Mitigation Bank | Approved-Active |

*Wetland Mitigation Umbrella Agreements*

| Corps District | Agreement Name | Status |
|---|---|---|
| Mobile | Alabama Department of Transportation Bank | Approved-Active |

**Alaska**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| Alaska | City and Borough of Juneau | Pending |
| Alaska | SE Alaska | Pending |

*In-Lieu-Fee Mitigation Programs*

| Corps District | Sponsor | Status |
|---|---|---|
| Alaska | Great Land Trust | Approved |
| Alaska | The Conservation Fund | Approved |
| Alaska | Kachemak Heritage Land Trust | Approved |
| Alaska | Southeast Alaska Land Trust | Approved |

**Arizona**

*In-Lieu-Fee Mitigation Programs*

| Corps District | Sponsor | Status |
|---|---|---|
| Los Angeles | Arizona Game and Fish Department | Approved |

**Arkansas**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| Little Rock | Hartman Bottoms Wetland Mitigation Bank | Approved-Active |
| Little Rock | Little Red River Mitigation Bank | Pending |
| Memphis | Brushy Lake Mitigation Bank | Approved-Active |
| Vicksburg | Albemarle Corporation | Approved-Active |
| Vicksburg | Lower Delta Mitigation Bank Site | Approved-Active |
| Vicksburg | Middle Ouachita River Mitigation Bank Site | Approved-Active |

*Wetland Mitigation Umbrella Agreements*

| Corps District | Agreement Name | Status |
|---|---|---|
| Vicksburg/Memphis | Arkansas State-Sponsored Wetlands Mitigation Bank | Approved-Active |

**California**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| Los Angeles | Barry Jones Wetland Mitigation Bank | Approved-Active |
| Los Angeles | Pilgrim Creek Mitigation Bank | Approved-Active |
| Los Angeles | Rancho Jamul Mitigation Bank | Approved-Active |
| Los Angeles | Santa Ana River Wetland Mitigation Bank | Approved-Active |
| Sacramento | Beach Lake Mitigation Bank | Approved-Active |
| Sacramento | Clay Station Mitigation Bank | Approved-Active |
| Sacramento | Cottonwood Creek Mitigation Bank | Approved-Active |
| Sacramento | Kimball Island Mitigation Bank | Approved-Active |
| Sacramento | Laguna Creek Mitigation Bank | Approved-Active |
| Sacramento | Stillwater Plains Mitigation Bank | Approved-Active |
| Sacramento | Wildlands Mitigation Bank | Approved-Active |
| San Francisco | Bou Mitigation Bank | Pending |
| San Francisco | Bracut Marsh Mitigation Bank | Approved-Soldout |
| San Francisco | Breuner Property Mitigation Bank | Pending |
| San Francisco | Burdell Mitigation Bank | Approved-Active |
| San Francisco | Canada Del Cierbo | Pending |
| San Francisco | Clem Carinalli | Pending |
| San Francisco | Desmond Bank | Pending |
| San Francisco | Fay Slough Mitigation Bank | Pending |
| San Francisco | Hale Bank | Pending |
| San Francisco | Horn Avenue Mitigation Bank | Pending |
| San Francisco | Laguna Carinalli Mitigation Bank | Pending |
| San Francisco | Moretti Dariy Mitigation Bank | Pending |
| San Francisco | Poncia Mitigation Bank | Pending |
| San Francisco | Sonoma Airport Mitigation Bank/Phase II (Duran) | Pending |
| San Francisco | Sonoma Airport Mitigation Bank/Phase II (Saunders Road) | Pending |
| San Francisco | Sonoma Airport Mitigation Bank/Phase II (Woolsey) | Pending |
| San Francisco | Southwest Santa Rosa Vernal Pool Preservation Bank | Approved-Active |
| San Francisco | Wikiup Mitigation Bank | Approved-Soldout |
| San Francisco | Wright Preservation Bank | Approved-Active |
| San Francisco | Yuba Drive Mitigation Bank | Pending |

*In-Lieu-Fee Mitigation Programs*

| Corps District | Sponsor | Status |
|---|---|---|
| Los Angeles | California Coastal Conservancy | Approved |
| Los Angeles | Mission Resource Conservation District | Approved |
| Los Angeles | Ojai Valley Land Conservancy | Approved |
| Los Angeles | Santa Monica Mountains Conservancy | Approved |
| Sacramento[1] | The Nature Conservancy | Approved |
| Sacramento | Sacramento County | Approved |
| South Pacific[2] | The National Fish and Wildlife Foundation | Approved |

**Colorado**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| Albuquerque/Omaha | Limon Bank | Approved-Active |
| Omaha | Marshall Mitigation Bank | Approved-Inactive |

[1] The geographic scope of the in-lieu-fee projects may include Colorado, Nevada, and Utah.
[2] The geographic scope of the in-lieu-fee projects may include Arizona, Colorado, Nevada, New Mexico, Texas, and Utah.

| | | |
|---|---|---|
| Omaha | Middle South Platte River Wetland Mitigation Bank | Approve |
| Omaha | Mile High Wetland Bank | Approved-Active |
| Omaha | Rocky Flats Mitigation Bank | Approved-Active |
| Omaha | Rocky Mountain Institute | Approved-Active |
| Omaha | Upper Platte River Wetland Mitigation Bank | Approved-Active |
| Omaha | Warm Springs Wetland Mitigation Bank | Approved-Active |
| Omaha | WetBank – Gunnison | Approved-Active |
| Omaha | Woman Creek Watershed Wetland Mitigation Bank | Pending |

**Florida**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| Jacksonville | American Equities Mitigation Land Bank at Reedy Creek | Approved-Active |
| Jacksonville | Barberville Conservation Area Mitigation Bank | Approved-Active |
| Jacksonville | Big Cypress Mitigation Bank | Approved-Active |
| Jacksonville | Bluefield Ranch Mitigation Bank | Approved-Active |
| Jacksonville | Boran Ranch Mitigation Bank | Approved-Active |
| Jacksonville | CGW Mitigation Bank | Approved-Active |
| Jacksonville | Cheval Tournament Players Club | Approved-Active |
| Jacksonville | Colbert-Cameron Mitigation Bank | Approved-Active |
| Jacksonville | East Central Florida Regional Mitigation Bank | Approved-Active |
| Jacksonville | Everglades Mitigation Bank- Phase I | Approved-Active |
| Jacksonville | Farmton Mitigation Bank | Approved-Active |
| Jacksonville | Florida Mitigation Bank | Approved-Active |
| Jacksonville | Florida Wetlandsbank | Approved-Soldout |
| Jacksonville | Garcon Peninsula Mitigation Bank | Approved-Active |
| Jacksonville | Graham Swamp Mitigation Bank | Approved-Active |
| Jacksonville | Hillsborough County Utilities Department Mitigation Bank | Approved-Active |
| Jacksonville | Lake Louisa and Green Swamp | Approved-Active |
| Jacksonville | Lake Monroe Mitigation Bank | Approved-Active |
| Jacksonville | Little Pine Island Mitigation Bank | Approved-Active |
| Jacksonville | Loxahatchee Mitigation Bank | Approved-Active |
| Jacksonville | Marion I Sustainable Mitigation Project | Approved-Active |
| Jacksonville | Northeast Florida Mitigation Bank | Approved-Active |
| Jacksonville | Northlakes Park Mitigation Bank | Approved-Active |
| Jacksonville | Panther Island Mitigation Bank | Approved-Active |
| Jacksonville | Polk Parkway Bank | Approved-Active |
| Jacksonville | Polk Regional Drainage Project Bank | Approved-Active |
| Jacksonville | Southeast Mitigation Bank | Approved-Active |
| Jacksonville | Split Oak Mitigation Bank | Approved-Soldout |
| Jacksonville | Sundew Mitigation Bank | Approved-Active |
| Jacksonville | Tampa Bay Wetland Bank | Approved-Active |
| Jacksonville | Tosahatchee State Reserve | Pending |
| Jacksonville | Tosohatchee Mitigation Bank | Approved-Active |
| Jacksonville | Treyburn/Collier Mitigation Bank | Approved-Active |
| Jacksonville | Turner Citrus, Inc. | Approved-Active |
| Jacksonville | Weisenfeld Mitigation Bank | Approved-Active |

*In-Lieu-Fee Mitigation Programs*

| Corps District | Sponsor | Status |
|---|---|---|
| Jacksonville | Audubon of Florida | Approved |
| Jacksonville | Department of Environmental Protection or Water Management Districts | Approved |
| Jacksonville | Palm Beach County | Approved |
| Jacksonville | South Florida Water Management District | Approved |

**Georgia**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| Savannah | Banks County Georgia Department of Transportation Bank | Pending |
| Savannah | Bazemore Mitigation Bank | Approved-Active |
| Savannah | Bowen Mill Pond Mitigation Bank | Approved-Active |
| Savannah | Burke County Mitigation Bank | Approved-Active |
| Savannah | Callaway Farms Mitigation Bank | Approved-Active |
| Savannah | Cecil Bay/Heart Pine Pond Mitigation Bank | Approved-Active |
| Savannah | Chattahoochee Mitigation Bank | Approved-Active |

| | | |
|---|---|---|
| Savannah | Cherry Creek Mitigation Bank | Approved-Active |
| Savannah | Etowah River Mitigation Preserve | Approved-Active |
| Savannah | Etowah River Stream Mitigation Bank | Approved-Active |
| Savannah | Flint River Basin Mitigation Bank | Pending |
| Savannah | Fort Stewart Mitigation Bank | Approved-Active |
| Savannah | Georgia Department of Transportation Black Creek Stream/ Wetland Mitigation Bank | Pending |
| Savannah | Hartsfield Atlanta Airport Mitigation Bank | Approved-Active |
| Savannah | Holy Ghost Mitigation Bank | Approved-Active |
| Savannah | Indian Creek Wetland Mitigation Bank | Approved-Active |
| Savannah | Marshlands Plantation, Inc. Mitigation Bank | Approved-Active |
| Savannah | Millhaven Mitigation Bank | Approved-Active |
| Savannah | Montezuma Mitigation Site | Approved-Active |
| Savannah | Moreland Place Bottom Mitigation Bank | Approved-Active |
| Savannah | Mulberry River Mitigation Bank | Approved-Active |
| Savannah | Ogeechee River Mitigation Bank | Approved-Active |
| Savannah | Old Thorn Pond Mitigation Bank | Approved-Active |
| Savannah | Phinizy Swamp Wetland Mitigation Bank (Merry Land) | Approved-Active |
| Savannah | Pine South Wetland Mitigation Bank | Approved-Active |
| Savannah | Prater Island Mitigation Bank | Approved-Active |
| Savannah | Pritchett Mitigation Bank | Pending |
| Savannah | Raleigh Joyce Tract Wetland Mitigation Bank | Approved-Active |
| Savannah | Satilla River Wetland Mitigation Bank | Approved-Active |
| Savannah | Wrayswood Bank | Pending |

*Wetland Mitigation Umbrella Agreements*

| Corps District | Agreement Name | Status |
|---|---|---|
| Savannah | The Streambank (North Georgia Regional Rivers & Streams Mitigation Project) | Approved-Active |

*In-Lieu-Fee Mitigation Programs*

| Corps District | Sponsor | Status |
|---|---|---|
| Savannah | Georgia Environmental Policy Institute | Approved |

**Idaho**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| Walla Walla | Clear Lakes Grade Ecological Bank | Pending |
| Walla Walla | Empire Ponds Wetland Mitigation Bank | Pending |
| Walla Walla | Georgetown Mitigation Bank | Approved-Active |
| Walla Walla | Old Beaver Mitigation Bank | Approved-Active |

*In-Lieu-Fee Mitigation Programs*

| Corps District | Sponsor | Status |
|---|---|---|
| Walla Walla | Ducks Unlimited | Approved |
| Walla Walla | The Nature Conservancy | Approved |
| Walla Walla | The Nature Conservancy | Pending |

**Illinois**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| Chicago | Bank 1 (Wetlands Research, Inc) | Approved-Active |
| Chicago | Bank 2 (Wetlands Research, Inc) | Approved-Active |
| Chicago | Big Sag Wetland Conservancy | Approved-Active |
| Chicago | Butterfield Road Wetland Mitigation Bank | Approved-Active |
| Chicago | Cornerstone | Approved-Soldout |
| Chicago | Cricket Creek | Approved-Soldout |
| Chicago | Des Plaines - Towpath Canal Wetland Mitigation Bank | Approved-Active |
| Chicago | Downer's Grove | Approved-Soldout |
| Chicago | Ferson Creek Wetland Bank | Approved-Active |
| Chicago | Girl Scout Sybaquay Council Mitigation Bank | Approved-Active |
| Chicago | Hanover Park Mitigation Area | Approved-Soldout |
| Chicago | Kishwaukee River Bottoms Wetland Mitigation Bank | Approved-Active |
| Chicago | Knollwood Mitigation Bank | Approved-Soldout |
| Chicago | Lilly Cache Wetland Bank | Pending |
| Chicago | LRH Partnership Marengo Mitigation Bank | Approved-Active |
| Chicago | Metra Mitigation Bank | Pending |
| Chicago | Miller Partnership Wetland Mitigation Bank | Pending |

| | | |
|---|---|---|
| Chicago | North Chicago | Pending |
| Chicago | North Glen Ellyn | Approved-Soldou |
| Chicago | Otter Creek Mitigation Bank | Approved-Active |
| Chicago | Prairie Creek | Approved-Active |
| Chicago | Sauk Trail Wetland Mitigation Bank | Approved-Active |
| Chicago | Sinclair Property Bank (Parr Development) | Pending |
| Chicago | Slough Creek Wetland Mitigation Bank | Approved-Active |
| Chicago | Winfield Creek | Approved-Inactive |
| Rock Island | Dekalb County Forest Preserve | Approved-Active |
| Rock Island | Kilbuck Creek Wetland Mitigation Bank | Approved-Active |
| St. Louis | Madison County Wetland Mitigation Bank | Pending |
| St. Louis | Richland Creek Wetland Mitigation Bank | Pending |
| St. Louis | Silver Creek Preserve Wetland Mitigation Bank | Pending |
| St. Louis | Southern Illinois Wetland Mitigation Bank | Pending |

*In-Lieu-Fee Mitigation Programs*

| Corps District | Sponsor | Status |
|---|---|---|
| Chicago | Corporation for Open Lands | Approved |
| | DuPage County | Approved |

**Indiana**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| Detroit | Lake Station Wetland Mitigation Bank | Approved-Active |
| Louisville | Geist Reservoir Mitigation Bank | Approved-Soldout |
| Louisville | Morse Reservoir Wetland Mitigation Bank | Approved-Soldout |
| Louisville | Schroeder Mitigation Bank | Approved-Active |
| Louisville | Wolfe Mitigation Bank | Pending |

**Iowa**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| Rock Island | G. William Coulthard Wetland Mitigation Bank | Approved-Active |
| Rock Island | Iowa Wetland Mitigation Bank (Coulter Marsh Agricultural Bank) | Approved-Active |
| Rock Island | North Raccoon HUC 8 Watershed Mitigation Bank | Pending |

**Kansas**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| Kansas City | Johnson County Wetlands Mitigation Bank | Approved-Active |

**Kentucky**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| Louisville | G & L Mitigation Bank | Approved-Active |
| Louisville | Nelson County Wetland Mitigation Bank Number One | Approved-Active |
| Louisville | Pond Creek Water Storage/Wetland Mitigation Bank | Approved-Active |
| Louisville | Wetland Bank of Kentucky (Hawkings Bank) | Approved-Active |

*Wetland Mitigation Umbrella Agreements*

| Corps District | Agreement Name | Status |
|---|---|---|
| Louisville | Kentucky Transportation Cabinet | Pending |

*In-Lieu-Fee Mitigation Programs*

| Corps District | Sponsor | Status |
|---|---|---|
| Louisville | Louisville and Jefferson County Metropolitan Sewer District | Approved |
| Louisville | Northern Kentucky University | Approved |

**Louisiana**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| New Orleans | Tenneco LaTerre Mitigation Bank | Approved-Active |
| Vicksburg | CLECO | Pending |
| Vicksburg | Honey Island Swamp Mitigation Bank | Approved-Active |
| Vicksburg | Planche | Pending |
| Vicksburg | Red River Mitigation Bank | Approved-Active |

*Wetland Mitigation Umbrella Agreements*

| Corps District | Agreement Name | Status |
|---|---|---|
| New Orleans | Interagency Agreement: The Nature Conservancy Longleaf Pine Flatwood/Savanna Mitigation Banks | Approved-Active |
| New Orleans | Southeast Louisiana Pine Flatwood Wetland Mitigation Bank | Approved-Active |

*In-Lieu-Fee Mitigation Programs*

| Corps District | Sponsor | Status |
|---|---|---|
| New Orleans | Louisiana Department of Natural Resources | Approved |
| New Orleans | A. Wilbert's Sons, LLC | Approved |
| New Orleans | Aurore Ranch | Approved |
| New Orleans | Bottomland Mitigation Lands, Inc. | Approved |
| New Orleans | Dixie Environmental Services Company | Approved |
| New Orleans | Good Growth Conservancy, Inc. | Approved |
| New Orleans | Gremillion Land Co., LLC | Approved |
| New Orleans | Gulf Coast Flatwoods | Approved |
| New Orleans | Herbert Thomasson | Approved |
| New Orleans | Lago Espanol, LLC | Approved |
| New Orleans | Louisiana Wetlands, LLC | Approved |
| New Orleans | Louisiana Wetlands, LLC | Approved |
| New Orleans | Nelson, April, and Grant Guillory | Approved |
| New Orleans | Pat Dejean and Arbry Soileau | Approved |
| New Orleans | South Louisiana Mitigation, LLC | Approved |
| New Orleans | South Louisiana Mitigation, LLC | Approved |
| New Orleans | Stream Wetland Services, LLC | Approved |
| Vicksburg[3] | Delta Environmental Land Trust | Approved |

**Maine**

*In-Lieu-Fee Mitigation Programs*

| Corps District | Sponsor | Status |
|---|---|---|
| | Town of Kittery | Pending |
| | Town of York | Pending |

**Maryland**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| Baltimore | Middle Patuxent River Revitalization Project | Approved-Inactive |

*Wetland Mitigation Umbrella Agreements*

| Corps District | Agreement Name | Status |
|---|---|---|
| Baltimore | Maryland State Highway Administration | Approved-Active |
| Baltimore | Prince George's County Wetland Banking System | Approved-Active |

*In-Lieu-Fee Mitigation Programs*

| Corps District | Sponsor | Status |
|---|---|---|
| | Maryland Department of Environment | Approved |

**Massachusetts**

*Wetland Mitigation Umbrella Agreements*

| Corps District | Agreement Name | Status |
|---|---|---|
| New England | Massachusetts Pilot Wetlands Banking Project | Approved-Active |

**Michigan**

*Wetland Mitigation Umbrella Agreements*

| Corps District | Agreement Name | Status |
|---|---|---|
| Detroit | Wayne County Wetland Mitigation Bank | Approved-Active |

**Minnesota**

*Wetland Mitigation Umbrella Agreements*

| Corps District | Agreement Name | Status |
|---|---|---|
| St. Paul | Minnesota Department of Transportation Mitigation Banking System | Approved-Active |

[3] The geographical scope of the in-lieu-fee projects may also include Arkansas and Mississippi.

**Mississippi**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| Mobile | Hickory Creek Mitigation Bank | Pending |
| Mobile | Houlka Creek Mitigation Bank | Pending |
| Mobile | Mississippi Wetlands Bank | Approved-Active |
| Mobile | Murphrey Evans Mitigation Bank | Pending |
| Mobile | Old Fort Bayou Mitigation Bank | Approved-Active |
| Vicksburg | Pearl River Mitigation Bank | Approved-Active |
| Vicksburg | Stennis Space Center Mitigation Bank | Approved-Active |
| Vicksburg/Memphis | Delta Mitigation Bank | Approved-Active |

*Wetland Mitigation Umbrella Agreements*

| Corps District | Agreement Name | Status |
|---|---|---|
| Mobile/Vicksburg | South Mississippi Mitigation Bank | Approved-Active |
| Vicksburg | Argyle, Inc. Mitigation Banking Program Agreement | Approved-Active |
| Vicksburg | Mississippi Band of Choctaw Indians Mitigation Banking Program Agreement | Approved-Active |
| Vicksburg | Mississippi Highway Department Mitigation Bank | Approved-Active |

**Missouri**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| Memphis | Southeast Missouri Agricultural Wetland Mitigation Bank | Approved-Active |
| St. Louis | Big Rivers Wetland Mitigation Bank | Approved-Active |
| St. Louis | Fox Creek Stream Mitigation Bank | Approved-Active |
| St. Louis | Lower Missouri River Mitigation Bank | Approved-Active |
| St. Louis | Rosedale Wetland Mitigation Bank | Approved-Active |
| St. Louis | Westwinds Wetland Mitigation Bank | Approved-Active |

*In-Lieu-Fee Mitigation Programs*

| Corps District | Sponsor | Status |
|---|---|---|
| Kansas City | Missouri Conservation Heritage Foundation | Approved |
| Little Rock[4] | Missouri Conservation Heritage Foundation | Approved |
| Memphis[5] | Missouri Conservation Heritage Foundation | Approved |
| St. Louis | Missouri Conservation Heritage Foundation | Approved |

**Nebraska**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| Omaha | Blue Heron Wetland Mitigation Bank | Pending |
| Omaha | City of Lincoln Wetland Mitigation Bank | Pending |
| Omaha | Hobson Yard Wetland Mitigation Bank | Approved-Active |
| Omaha | North Platte Wetland Mitigation Bank | Approved-Active |
| Omaha | Papio-Missouri River Natural Resources District Wetland Mitigation Bank | Pending |

*Wetland Mitigation Umbrella Agreements*

| Corps District | Agreement Name | Status |
|---|---|---|
| Omaha | Nebraska Department of Roads Wetland Mitigation Bank | Approved-Active |

**Nevada**

*Wetland Mitigation Umbrella Agreements*

| Corps District | Agreement Name | Status |
|---|---|---|
| Sacramento | Clark County Mitigation Bank | Approved-Active |

**New Jersey**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| New York | Bog Brook Wetlands Enhancement Bank | Approved-Active |
| New York | C&C Builders Wetland Mitigation Bank Phase I | Approved-Active |
| New York | Marsh Resources Inc. Meadowlands Mitigation Bank | Approved-Active |
| New York | Pio Costa Wetlands Mitigation Bank | Approved-Active |

[4] The geographic scope of the in-lieu-fee projects may also include Mississippi.
[5] The geographic scope of the in-lieu-fee projects may also include Mississippi.

| | | |
|---|---|---|
| New York | Rancocas Wetland Mitigation Bank Phase I | Approved-Inactive |
| New York | Vivian Chimento Wetland Mitigation Bank | Approved-Inactive |
| New York | Willow Grove Lake Wetlands Mitigation Bank | Approved-Active |
| New York | Woodbury Creek Wetlands Mitigation Bank | Approved-Active |
| New York | Wyckoff's Mills Wetland Mitigation Bank | Approved-Active |

*In-Lieu-Fee Mitigation Programs*

| Corps District | Sponsor | Status |
|---|---|---|
| New York | Wetlands Mitigation Council | Approved |

**New York**

*Wetland Mitigation Bank*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| Buffalo | Fort Drum Mitigation Bank | Pending |
| Buffalo | Northern Montezuma DOT Bank | Pending |
| Buffalo | Rochester's Cornerstone Group-Rochester International | Approved-Active |
| Buffalo | Tonawanda Creek Mitigation Bank | Pending |

*In-Lieu-Fee Mitigation Programs*

| Corps District | Sponsor | Status |
|---|---|---|
| Buffalo | The Western New York Land Conservancy | Approved |
| Buffalo | Save-the-County Land Trust, Inc. | Approved |
| Buffalo | Town of Brighton | Approved |
| Buffalo | The Nature Conservancy, Central and Western New York Chapter | Approved |

**North Carolina**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| Wilmington | Barra Farms Cape Fear Regional Mitigation Bank | Approved-Active |
| Wilmington | Bear Creek Mill Branch Mitigation Bank | Pending |
| Wilmington | Croatan Wetlands Mitigation Bank | Pending |
| Wilmington | Deep Creek Wetland Mitigation Bank | Pending |
| Wilmington | Fisher River Wetland Mitigation Bank | Pending |
| Wilmington | Flat Swamp Wetland Mitigation and Stream Restoration Bank | Approved-Active |
| Wilmington | Greater Sandy Run Mitigation Bank | Approved-Active |
| Wilmington | Hidden Lake Wetland Mitigation Bank | Approved-Active |
| Wilmington | Hoffman Forest Wetland Mitigation Bank | Pending |
| Wilmington | Scuppernong River Corridor Wetland Mitigation Bank | Approved-Soldout |
| Wilmington | Sides Mitigation Bank | Pending |
| Wilmington | Tar-Pam Wetland and Stream Mitigation Bank | Pending |
| Wilmington | Vann Swamp Mitigation Bank | Pending |

*Wetland Mitigation Umbrella Agreements*

| Corps District | Agreement Name | Status |
|---|---|---|
| Wilmington | Neu-Con Umbrella Mitigation Bank | Approved-Active |
| Wilmington/Norfolk | Great Dismal Swamp Restoration Bank Umbrella MOA | Approved-Active |

*In-Lieu-Fee Mitigation Programs*

| Corps District | Sponsor | Status |
|---|---|---|
| Wilmington | NC Department of Environment and Natural Resources | Approved |

**North Dakota**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| Omaha | North Dakota | Approved-Active |
| Omaha | Vollrath Mitigation Bank | Approved-Active |

**Ohio**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| Buffalo | Grand River Lowlands and Cherry Valley Mitigation Sites | Approved-Active |
| Buffalo | North Coast Regional Wetland and Stream Mitigation Bank | Pending |
| Buffalo | Ohio Edison Grand River Mitigation Bank | Approved-Active |
| Buffalo | Sandy Ridge Mitigation Site | Approved-Soldout |
| Buffalo | Three Eagles Mitigation Site | Approved-Active |
| Buffalo | Trumbull Creek Mitigation Site | Approved-Active |

| | | |
|---|---|---|
| Huntington | Big Island | Approved-Soldout |
| Huntington | Crystal Springs Mitigation Bank | Pending |
| Huntington | Hebron Mitigation Bank | Approved-Soldout |
| Huntington | Little Sciota Mitigation Bank - Phase II | Pending |
| Huntington | Little Scioto River Mitigation Site | Approved-Active |
| Huntington | Panzner Wetland Wildlife Reserve Mitigation Bank | Approved-Active |
| Huntington | Slate Run Mitigation Site | Approved-Active |

*Wetland Mitigation Umbrella Agreements*

| Corps District | Agreement Name | Status |
|---|---|---|
| Buffalo/ Huntington | North Coast Regional Wetland and Stream Mitigation Bank | Approved-Active |

*In-Lieu-Fee Mitigation Programs*

| Corps District | Sponsor | Status |
|---|---|---|
| Buffalo | Chagrin River Land Conservancy | Approved |
| Buffalo | Cleveland Metroparks | Approved |
| Buffalo | Cleveland Museum of Natural History | Approved |
| Buffalo | Department of Natural Resources | Approved |
| Buffalo | Geauga Park District | Approved |
| Buffalo | Grand River Partners, Inc. | Approved |
| Buffalo | Hancock Park District | Approved |
| Buffalo | Hudson Land Conservancy, Inc. | Approved |
| Buffalo | Johnny Appleseed Metropolitan Park District | Approved |
| Buffalo | Lake Metroparks | Approved |
| Buffalo | Medina County Park District | Approved |
| Buffalo | Metro Parks, Serving Summit County | Approved |
| Buffalo | Metropolitan Park District of the Toledo Area | Approved |
| Buffalo | Natural Areas Stewardship, Inc. | Approved |
| Buffalo | Park District Foundation of Allen County | Approved |
| Buffalo | Portage County Park District | Approved |
| Buffalo | Portage Land Association Conservation Education | Approved |
| Buffalo | The Audubon Society of Greater Cleveland | Approved |
| Buffalo | The Nature Conservancy, Ohio Chapter | Approved |
| Buffalo | Tinkers Creek Land Conservancy, Inc. | Approved |
| Buffalo | West Creek Preservation Committee | Approved |
| Buffalo | Willoughby Natural Areas Conservancy | Approved |
| Buffalo | Wood County Park District | Approved |
| Huntington | Cleveland Museum of Natural History | Approved |
| Huntington | Ohio Wetlands Corporation | Approved |

**Oklahoma**

*Wetland Mitigation Umbrella Agreements*

| Corps District | Agreement Name | Status |
|---|---|---|
| Tulsa | Oklahoma Department of Transportation Memorandum of Agreement | Approved-Active |

**Oregon**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| Portland | Amazon Creek Mitigation Bank | Pending |
| Portland | Astoria Airport Mitigation Bank | Approved-Inactive |
| Portland | Camas Swale Mitigation Bank | Pending |
| Portland | City of Silverton Mitigation Bank | Pending |
| Portland | Coyote Creek Mitigation Bank | Pending |
| Portland | Fernhill Mitigation Bank | Pending |
| Portland | Frazier Creek | Pending |
| Portland | Garret Creek | Pending |
| Portland | Marion Mitigation Bank | Approved-Active |
| Portland | Mud Slough Wetland Mitigation Bank | Approved-Active |
| Portland | Oak Creek Mitigation Bank | Approved-Active |
| Portland | Running Y Ranch Mitigation Bank | Pending |
| Portland | Weathers' Wetland Mitigation Bank | Approved-Active |
| Portland | Winmar (Catellus) Mitigation Bank | Approved-Active |

*Wetland Mitigation Umbrella Agreements*

| Corps District | Agreement Name | Status |
|---|---|---|
| Portland | West Eugene Wetlands Plan | Approved-Active |

*In-Lieu-Fee Mitigation Programs*

| Corps District | Sponsor | Status |
|---|---|---|
| Portland | Oregon Division of State Lands | Approved |

**Pennsylvania**

*Wetland Mitigation Umbrella Agreements*

| Corps District | Agreement Name | Status |
|---|---|---|
| | Pennsylvania DOT Wetland Banking MOA | Pending |
| Baltimore | Interagency Agreement Advance Wetland Compensation PennDOT District 3-0 | Approved-Active |
| Baltimore/Pittsburgh | Interagency Agreement Advance Wetland Compensation PennDOT District 9-0 | Approved-Active |
| Baltimore/Pittsburgh | Interagency Agreement Advance Wetland Compensation PennDOT District 2-0 | Approved-Active |
| Pittsburgh | Interagency Agreement Advance Wetland Compensation PennDOT District 12-0 | Approved-Active |

*In-Lieu-Fee Mitigation Programs*

| Corps District | Sponsor | Status |
|---|---|---|
| Pittsburgh | National Fish and Wildlife Foundation | Approved |

**South Carolina**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| Charleston | Black River Bottomland Hardwoods Mitigation Bank | Approved-Active |
| Charleston | Black River Mitigation Bank (SC Dept. of Transportation) | Approved-Active |
| Charleston | Friends Neck Wetland Mitigation Bank | Approved-Active |
| Charleston | Huspa Creek Wetland Mitigation Bank | Approved-Active |
| Charleston | Playcard Mitigation Bank | Approved-Soldout |
| Charleston | Playcard II Mitigation Bank | Approved-Active |
| Charleston | Richland County Broad River Mitigation Bank | Approved-Active |
| Charleston | Sandy Island Mitigation Bank | Approved-Active |
| Charleston | Swallow Savannah Mitigation Bank | Approved-Active |
| Charleston | Vandross Bay Mitigation Bank | Approved-Soldout |

*Wetland Mitigation Umbrella Agreements*

| Corps District | Agreement Name | Status |
|---|---|---|
| Charleston | Memorandum of Agreement for the Savannah River Site | Approved-Active |

*In-Lieu-Fee Mitigation Programs*

| Corps District | Sponsor | Status |
|---|---|---|
| Charleston | National Audubon Society | Approved |
| Charleston | Historic Ricefields Association | Approved |

**South Dakota**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| Omaha | City of Sioux Falls Wetland Mitigation Bank | Pending |

*Wetland Mitigation Umbrella Agreements*

| Corps District | Agreement Name | Status |
|---|---|---|
| Omaha | Wetland Accounting System | Approved-Active |

**Tennessee**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| Little Rock | Riverside Coastal Mitigation Bank | Pending |
| Memphis | Madison County Wetland Mitigation Bank Site Plan | Approved-Active |
| Memphis | Obion Wetland Mitigation Bank Site Plan | Approved-Active |
| Memphis | Wolf River Wetland Mitigation Bank | Approved-Active |
| Nashville | Coffee County Wetland Mitigation Bank | Approved-Active |
| Nashville | Harpeth Wetland Mitigation Bank | Approved-Active |
| Nashville | Shady Valley Wetland Mitigation Bank | Approved-Active |

*Wetland Mitigation Umbrella Agreements*

| Corps District | Agreement Name | Status |
|---|---|---|
| Memphis | Tennessee Dept of Transportation Umbrella Bank | Approved-Active |

**Texas**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| Fort Worth | Anderson Tract Mitigation Bank | Approved-Active |
| Fort Worth | Big Woods on the Trinity River Mitigation Bank | Pending |
| Fort Worth | Byrd Tract Mitigation Bank | Approved-Active |
| Fort Worth | Hawkins Mitigation Bank | Approved-Active |
| Fort Worth | Klamm Mitigation Bank | Approved-Active |
| Fort Worth | Trinity River Mitigation | Approved-Active |
| Fort Worth | West Minola Mitigation Bank | Pending |
| Galveston | Blue Elbow Swamp Mitigation Bank | Approved-Active |
| Galveston | Coastal Bottomlands Mitigation Bank | Approved-Active |
| Galveston | Fennessey Ranch Wetland Mitigation Bank | Pending |
| Galveston | Greens Bayou Wetland | Approved-Active |
| Galveston | Katy-Cypress Wetland Mitigation Bank | Approved-Active |
| Galveston | Katy Prairie Mitigation Bank | Approved-Inactive |
| Galveston | Neches River Cypress Swamp Preserve | Approved-Active |
| Galveston | Palacios Wetland Mitigation Bank | Approved-Active |

*In-Lieu-Fee Mitigation Programs*

| Corps District | Sponsor | Status |
|---|---|---|
| Fort Worth | The Nature Conservancy | Approved |
| Galveston | Armand Bayou Nature Cente | Pending |
| Galveston | Galveston Bay Foundation | Pending |
| Galveston | Katy Prairie Conservancy | Approved |
| Galveston | National Fish and Wildlife Foundation | Approved |
| Galveston | Texas Parks and Wildlife | Approved |
| Galveston | The Nature Conservancy | Pending |

**Utah**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| Sacramento | Bailey's Meadow Mitigation Bank | Approved-Active |
| Sacramento | Brighton Shorebird Preserve | Pending |
| Sacramento | Cub River Wetland Mitigation Bank | Pending |
| Sacramento | Inland Sea Shorebird Reserve Bank | Approved-Active |
| Sacramento | Northeast Utah Mitigation Bank | Pending |
| Sacramento | Northern Utah Wetland Mitigation Bank | Pending |
| Sacramento | Provo City Mitigation Bank | Pending |
| Sacramento | Rainey Mitigation Bank | Approved-Soldout |
| Sacramento | Seifert Mitigation Bank | Approved-Soldout |
| Sacramento | Warner Mitigation Bank | Pending |

**Virginia**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| Norfolk | Cedar Run Wetlands Bank | Approved-Active |
| Norfolk | Chickahominy Environmental Bank | Approved-Active |
| Norfolk | City of Portsmouth Virginia Wetland Bank | Approved-Inactive |
| Norfolk | Hampton Roads Wetland (Compaz) Mitigation Bank | Pending |
| Norfolk | Hampton Roads Wetland Bank | Pending |
| Norfolk | Highland Springs Mitigation Bank | Pending |
| Norfolk | James River Mitigation Landbank | Approved-Active |
| Norfolk | Liesfield Wetland Mitigation Bank | Pending |
| Norfolk | Mattaponi Wetland Bank | Approved-Active |
| Norfolk | Neabsco Wetland Bank (Julie J. Metz) | Approved-Soldout |
| Norfolk | New Kent Environmental Bank | Pending |
| Norfolk | North Fork Wetland Bank | Approved-Active |
| Norfolk | North Landing River Mitigation Bank | Pending |
| Norfolk | ODEC - Virginia Power Wetland Mitigation Bank | Approved-Active |
| Norfolk | Pristine Wetland Mitigation Bank | Pending |
| Norfolk | Richmond International Airport Wetland Mitigation Bank | Pending |
| Norfolk | Shenandoah Wetland Bank | Approved-Active |
| Norfolk | Virginia Department of Transportation Goose Creek Bank | Approved-Active |

| | | |
|---|---|---|
| Norfolk | White Cedar Mitigation Bank | Approved-Active |
| Norfolk | William Benjamin Nottoway River Wetland Bank | Pending |
| Norfolk | York River Mitigation Bank | Pending |

*Wetland Mitigation Umbrella Agreements*

| Corps District | Agreement Name | Status |
|---|---|---|
| | Clinch Powell Wetlands Bank | Pending |
| Norfolk | Davis Wetland Bank | Approved-Active |
| Norfolk | Hampton Road Airport Mitigation Bank | Approved-Active |
| Norfolk | James River Wetland Mitigation Bank Memorandum of Agreement | Approved-Active |
| Norfolk | Lower James River Wetland Mitigation Bank | Approved-Active |
| Norfolk | Virginia Beach Wetland Virginia Beach Wetland Memorandum of Agreement | Approved-Active |
| Wilmington/ Norfolk | Great Dismal Swamp Restoration Bank | Approved-Active |

*In-Lieu-Fee Mitigation Programs*

| Corps District | Sponsor | Status |
|---|---|---|
| Norfolk | The Nature Conservancy | Approved |

**Washington**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| Seattle | McHugh Wetland Mitigation Bank | Approved-Active |
| Seattle | Meadowland Wetland Mitigation Bank | Approved-Active |
| Seattle | Port of Everett | Pending |
| Seattle | Triangle Cove Wetland Mitigation Bank | Pending |

*Wetland Mitigation Umbrella Agreements*

| Corps District | Agreement Name | Status |
|---|---|---|
| Seattle | King County Wetland Mitigation Banking Program | Approved-Active |
| Seattle | Pierce County Public Works and Utilities Road Dept. Mitigation Banking Program | Approved-Active |
| Seattle | Snohomish County Airport Wetland Compensation Bank Program | Approved-Active |
| Seattle | Washington DOT Wetland Compensation Bank Program | Approved-Active |

*In-Lieu-Fee Mitigation Programs*

| Corps District | Sponsor | Status |
|---|---|---|
| | Clallum County | Approved |

**West Virginia**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| Huntington | West Virginia Wetland Bank | Pending |

**Wisconsin**

*Wetland Mitigation Banks*

| Corps District | Bank Name | Bank Status |
|---|---|---|
| St. Paul | Cutler Cranberry Company | Approved-Active |
| St. Paul | Dane County Wetland Mitigation Bank (Lodi Site) | Approved-Active |
| St. Paul | Northland Cranberries Wetland Mitigation Bank | Approved-Active |
| St. Paul | Patrick Lake Wetland Mitigation Bank | Approved-Soldout |
| St. Paul | Wisconsin Waterfowl Association Bank (Walkerwin Bank) | Approved-Active |
| St. Paul | Wood County Bank | Pending |

*Wetland Mitigation Umbrella Agreements*

| Corps District | Agreement Name | Status |
|---|---|---|
| St. Paul | Wisconsin Department of Transportation Wetland Mitigation Banking Technical Guideline - Draft Revision | Approved-Active |

**Wyoming**

*Wetland Mitigation Umbrella Agreements*

| Corps District | Agreement Name | Status |
|---|---|---|
| | Wyoming Statewide Wetland Mitigation Bank | Approved-Active |
| Omaha | Wyoming Department of Transportation | Approved-Inactive |

# APPENDIX D: BIBLIOGRAPHY OF AUTHORIZING INSTRUMENTS FOR ALL APPROVED MITIGATION BANKS AND IN-LIEU-FEE PROGRAMS

Below are the authorizing instruments categorized by state for the wetland mitigation banks, umbrella agreements, and in-lieu-fee mitigation programs collected and analyzed for this study. The instruments are listed first by type (bank, umbrella, or in-lieu-fee), and then by state. In some cases, banks or programs were established through legislation or documentation that was not available. This appendix includes only those authorizing instruments that were available for analysis. Information is current through December 2001.

## Wetland Mitigation Bank Authorizing Instruments

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Save Our Streams LLC. *Banking Instrument for The Streambank (North Georgia Regional Rivers & Streams Mitigation Project).* Banking Instrument. GA, 2000.

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### In-Lieu-Fee Authorizing Instruments

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The Nature Conservancy. *Agreement Between The Nature Conservancy and the Regulatory Branch, U.S. Army Corps of Engineers, Sacramento District to Establish a Fee-Based Compensatory Mitigation Program Under Section 404 of the Clean Water Act.* CA, CO, NV, and UT. 2000.

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The Nature Conservancy. *Agreement Between the Nature Conservancy and the U.S. Army Corps of Engineers, Fort Worth District to Establish an In-Lieu-Fee Program in the Fort Worth District.* TX.

**Virginia**
The Nature Conservancy. *Memorandum of Understanding Between The Nature Conservancy and the U.S. Army Corps of Engineers.* MOU. VA. 1995.

# APPENDIX E: WETLAND MITIGATION BANKING AND IN-LIEU-FEE MITIGATION LAWS, REGULATIONS, AND GUIDELINES

Below are state laws, regulations, and guidelines for wetland mitigation and in-lieu-fee mitigation. Blank fields indicate that the state has not promulgated either statutes, regulations, or guidelines addressing wetland mitigation banking or in-lieu-fee mitigation. Information is current through December 2001.

**Wetland Mitigation Banking Laws, Regulations, and Guidelines**

| State | Statute | Regulation | Guideline |
|---|---|---|---|
| Arkansas | Ark. Code Ann. §§15-22-1001 - 1012 | Ark. Reg. §§1201.1 – 1206.3 | Arkansas Soil & Water Conservation Commission. *Arkansas Wetlands Mitigation Bank Program*. <www.state.ar.us/aswcc/page19.html> |
| California | Cal. Pub. Res. Code §30233, Cal. Fish & Game Code §§1175-1796, 1850 - 1851 | | Douglas Wheeler and James Strock. *Official Policy on Conservation Banks*. 7 Apr. 1995. <ceres.ca.gov/wetlands/policies/mitbank.html> |
| Colorado | | | *Guidance to Colorado Division of Wildlife Staff on the Establishment, Use and Operation of Mitigation Banks in Colorado*. 1 Nov. 2000. |
| Florida | Fla. Stat. ch. 373.4135-.4137, ch. 373.414, ch. 403.9322 | Fla. Admin. Code Ann. R. 62-342.100 – 62-342.850 | |
| Georgia | | | USACE, Savannah District; USEPA, Region IV; USFWS, Southeast Region; and GADNR. *Guidelines on the Establishment & Operation of Wetland Mitigation Banks in Georgia*. 1995. *Addendum*. 1996. <www.sas.usace.army.mil/bankguid.htm> |
| Hawaii | | | Hawaii Wetland Management Policy Workgroup. |

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| | | | *Hawaii Wetland Management Policy*. Apr. 1999. |
| Idaho | | | *Operating Procedures for Development and Use of a Wetland Bank in Idaho*. |
| Illinois | 20 Ill. Comp. Ann. Stat. 830/1-1 – 830/4-1 | Ill. Admin. Code tit. 17, §§1090.10-.100 | |
| Indiana | | | MBRT. *Interagency Coordination Agreement on Wetland Mitigation Banking within the State of Indiana*. <www.lrl.usace.army.mil/orf/info/ICA1097.htm> |
| Iowa | | | *Technical Guidance for Wetland Mitigation Banking in Iowa*. |
| Kentucky | Ky. Rev. Stat. Ann. §§224.16.070, 150.255 | | USACE, Louisville District. *Wetland Mitigation Guidelines*. 16 Apr. 1996. |
| Louisiana | La. Rev. Stat. Ann. §49:214.41 | La. Admin. Code tit. 43:I §724(F) | |
| Maine | Me. Rev. Stat. Ann. Tit. 38, §480-Z | 310 Code Me. R. §§5, 7 | |
| Maryland | Md. Regs. Code tit. 26, §§23.04.01 - .07 | Md. Code §5-910 | David Walbeck and Denise Clearwater. *Maryland Nontidal Wetland Mitigation Guidance*. Nontidal Wetlands and Waterways Division.July1998. <www.mde.state.md.us/wetlands/mitguide.htm>; Interagency Mitigation Task Force. *Maryland Compensatory Mitigation Guidance*. Aug.1994. |
| Michigan | | 12 Mich. Admin. Code R. §§281.951-.961 | |
| Minnesota | Minn. Stat. Ann. §103G.2242 | Minn. R. §§8420.0700 - .0760 | Minnesota Board of Water & Soil Resources. *Wetland Banking Minnesota Wetland Conservation Act*. 1994. |
| Mississippi | Miss. Code §65-1-51 | | |
| Missouri | | | MO Department of Natural Resources, MO Department |

| | | | |
|---|---|---|---|
| | | | of Conservation, USFWS, USEPA, USACE, NRCS, and Missouri Department of Transportation. *State of Missouri Aquatic Resources Mitigation Guidelines*. May 1998. |
| Nebraska | Neb. Rev. Stat. §39-1320 | | |
| Nevada | Nev. Rev. Stat. §244.388 | | |
| New Jersey | N.J. Stat. Ann. §§13:9B-3 – 13:9B-5, 13:9B-13 – 13:9B-15 | N.J. Admin Code tit. 7, §§7A-14.1 – 14.6 | |
| North Carolina | N.C. Gen. Stat. §§143.214.8 - .11 | N.C. Admin. Code tit. 15A 02R.0402 | |
| Ohio | | Ohio Admin. Code §3745-1-54 | |
| Oregon | Or. Rev. Stat. §§196.600 - .665 | Or. Admin. R. 141-085-0115, 141-085-0260 – 0650 | *Wetland Mitigation Banking Guidebook for Oregon*. 2000. |
| South Carolina | | | USACE, Charleston District; USEPA, Region IV; USFWS-Charleston Ecological Services Office; SCDNR; SCDHEC; and USDA-NRCS. *Joint State/Federal Administrative Procedures for the Establishment & Operation of Wetland Mitigation Banks in South Carolina*. July 1996. <www.sac.usace.army.mil/permits/mitigate.html> |
| Tennessee | Tenn. Code Ann. §70-1-302(e) | | |
| Texas | 12 Tex. Nat. Res. Code Ann. §§221.001-.048 | 31 Tex. Admin. Code §§16.3(c)(1)(D-F), 501.14(h)(1)(E), 501.14(h)(2), 501.14(e). 86 Tex. Admin. Code §§6.01-6.07 | |
| Virginia | Va. Code Ann. §§28.2-1308, 33.1-223.2:1, 62.1-44.15:5 | | Virginia Marine Resources Commission. *Guidelines for the Establishment, Use and Operation of Tidal Wetland Mitigation Banks In Virginia*. 1998. <www.state.va.us/mrc/guidli.htm> |

| | | | |
|---|---|---|---|
| Washington | Wash. Rev. Code Ann. §§90.84.005 - .070, 47.12.330 - .360 | | WA Department of Ecology, WA Department of Fish and Wildlife, USACE, USEPA, and USFWS. *Guidelines for Developing Freshwater Wetlands Mitigation Plans and Proposals*. Mar. 1994. |
| Wisconsin | Wis. Stat. §§281.37, 30.12(4) | Wis. Admin. Code §§ 350.01 – 350.14 | WI Department of Transportation. *Wetland Mitigation Banking Technical Guideline*. July 1993. |
| Wyoming | Wyo. Stat. Ann. §§35-11-308 – 311 | | WY Department of Environmental Quality. *Wyoming Statewide Wetland Mitigation Bank: Guidelines for Interpretation and Implementation*. Apr. 1995. |

**In-Lieu-Fee Mitigation Laws, Regulations, and Guidelines**

| State | Statute | Regulation | Guideline |
|---|---|---|---|
| Arizona | | | Arizona Game and Fish Department. *Project Mitigation-Habitat Restoration, Enhancement, and Protection Trust Account*. 26 July 2000. |
| Colorado | | | *Guidance to Colorado Division of Wildlife Staff on the Establishment, Use and Operation of Mitigation Banks in Colorado*. 1 Nov. 2000. |
| Florida | Fla. Stat. Ann. §§ 373.414(1)(b), 403.9332 | Fla. Admin. Code Ann. r. §62-342.550 | |
| Louisiana | | La. Admin. Code tit. 43, §724.I | |
| Maine | Me. Rev. Stat. Ann. tit. 38, §480-Z | | |
| Maryland | | Md. Regs. Code tit. 26, | Interagency Mitigation Task Force. *Maryland* |

| | | | |
|---|---|---|---|
| | | §§23.04.07, 24.05.01 | *Compensatory Mitigation Guidance*. Aug. 1994. |
| New Jersey | N.J. Stat. Ann. §13:9B-13-15 | N.J. Admin. Code, tit. 7, § 7A-14.2(a)(4) | |
| North Carolina | N.C. Gen. Stat. §§143.214.11 -.13 | N.C. Admin. Code tit. 15A, 02R.0402 | |
| Oregon | | Or. Admin. R. 141-085-0115, 141-085-0260 to –0650 | |
| Pennsylvania | | 25 Pa. Code § 105, Appendix O | PA Department of Environmental Protection. *Pennsylvania Wetlands Replacement Project (Fund) Guidelines for Restoration Projects*. 18 Jan. 1996. <www.dep.state.pa.us/dep/deputate/w..gt/Wqp/WQP_WWEC/GENERAL/WETLANDS.fund.htm> |
| South Carolina | | | South Carolina Mitigation Bank Review Team. *In-Lieu Fee Based Mitigation Guidelines*. Mar. 1998. |
| Virginia | Va. Code Ann. §62.1-44.15:5 | | *Nationwide Permit Mitigation and Trust Fund Guidance*. 31 Aug. 2000. |

# APPENDIX F: WETLAND MITIGATION BANKS – DATA

Below are approved wetland mitigation banks are grouped by state and further organized according to Corps district. The year the bank was formally established (received official signatures) is indicated. The total acreage of the bank is the total number of acres approved for mitigation. Each bank is categorized as single-user, public commercial, private commercial, combination public-private commercial, or public. Whether the bank is sponsored by a public entity (e.g. state or local agency) or a private entity (e.g. for-profit company or non-profit organization) is also noted. Blank fields indicate that the information was not available at the time of data collection. (See Appendix B: Glossary of Terms for bank type and banks sponsor definitions). Information is current through December 2001.

| State | Corps District | Bank Name | Year Established | Total Acreage | Bank Type | Bank Sponsor Type | Bank Sponsor |
|---|---|---|---|---|---|---|---|
| **Alabama** | | | | | | | |
| | Mobile | | | | | | |
| | | Boykin-Lillian Wetland Mitigation Bank | 1999 | 1314 | Private commercial bank | Private | Wetland Environmental Technologies |
| | | Weeks Bay Mitigation Bank | 1998 | 1017 | Private commercial bank | Private | Wetland Restoration, L.L.C. |
| | Nashville | | | | | | |
| | | Flint Creek Wetland Mitigation Bank | 1998 | 652 | Private commercial bank | Private | Robinson Ecological Resources, Inc. |
| **Arkansas** | | | | | | | |
| | Little Rock | | | | | | |
| | | Hartman Bottoms Wetland Mitigation Bank | 2001 | 160 | Single-user bank | Public | Arkansas State Highway and Transportation Department |
| | Memphis | | | | | | |
| | | Brushy Lake Mitigation Bank | 1996 | 320 | Single-user bank | Public | Arkansas State Highway and Transportation Department |
| | Vicksburg | | | | | | |
| | | Albemarle Corporation | 1999 | 101 | Single-user bank | Private | Albemarle Corporation |
| | | Lower Delta Mitigation Bank Site | 1999 | 290 | Single-user bank | Public | Arkansas State Highway and Transportation Department |
| | | Middle Ouachita River Mitigation Bank Site | 2000 | 335 | Single-user bank | Public | Arkansas State Highway and Transportation Department. |
| **California** | | | | | | | |
| | Los Angeles | | | | | | |
| | | Barry Jones Wetland Mitigation Bank | 1997 | 140 | Single-user bank | Private | Pacific Bay Homes |
| | | Pilgrim Creek Mitigation Bank | 2000 | 50 | Single-user bank | Public | California Department of Transportation (Caltrans) |
| | | Rancho Jamul Mitigation Bank | 2000 | 109 | Private commercial | Private | Wildlands, Inc. |

| State | Corps District | Bank Name | Year Established | Total Acreage | Bank Type | Bank Sponsor Type | Bank Sponsor |
|---|---|---|---|---|---|---|---|
| | | Santa Ana River Wetland Mitigation Bank | 1997 | 174 | Public commercial bank | Public | Riverside County Park |
| | Sacramento | | | | | | |
| | | Beach Lake Mitigation Bank | 1991 | 142 | Single-user bank | Public | California Department of Transportation (Caltrans) |
| | | Clay Station Mitigation Bank | 1999 | 405 | Private commercial bank | Private | Elliott Homes, Inc. |
| | | Cottonwood Creek Mitigation Bank | 1994 | 40 | Public commercial bank | Public | California Department of Fish and Game, Region 1 |
| | | Kimball Island Mitigation Bank | 1998 | | | | Wildlands, Inc. |
| | | Laguna Creek Mitigation Bank | 1999 | 747 | Private commercial bank | Private | Conservation Resources, LLC |
| | | Stillwater Plains Mitigation Bank | 2000 | 834 | Private commercial bank | Private | Stillwater Plains Mitigation Bank, Inc. |
| | | Wildlands Mitigation Bank | 1994 | | Private commercial bank | Private | Wildlands, Inc. |
| | San Francisco | | | | | | |
| | | Bracut Marsh Mitigation Bank | 1980 | 14 | Public commercial bank | Public | California Coastal Conservancy |
| | | Burdell Mitigation Bank | 2000 | 131 | Private commercial bank | Private | Mount Burdell Enterprises/Burdell Ranch Partners |
| | | Southwest Santa Rosa Vernal Pool Preservation Bank | 1999 | 39 | Private commercial bank | Private | Sonoma Vernal Pool, Inc. |
| | | Wikiup Mitigation Bank | 1995 | 12 | Private commercial bank | Private | Wikiup Builders, L..P. |
| | | Wright Preservation Bank | 1997 | 76 | Public commercial bank | Public | Department of Fish and Game and the Sonoma County Ag. Preservation and Open Space District |
| **Colorado** | | | | | | | |
| | Albuquerque | | | | | | |
| | | Limon Bank | 1996 | 14 | Single-user bank | Public | Town of Limon |
| | Omaha | | | | | | |
| | | Middle South Platte River Wetland Mitigation Bank | 1999 | 85 | Private commercial bank | Private | Land and Water Resources, Inc. |
| | | Mile High Wetland Bank | 1999 | 390 | Private commercial bank | Private | Mile High Wetland Group, LLC |
| | | Rocky Flats Mitigation Bank | 1996 | | Single-user bank | Public | Department of Energy, Rocky Flats Field Office |
| | | Rocky Mountain Institute | 1998 | 60 | Private commercial bank | Private | Rocky Mountain Institute |
| | | Upper Platte River Wetland Mitigation Bank | 1998 | 82 | Private commercial bank | Private | Land and Water Resources, Inc. |
| | | Warm Springs Wetland Mitigation Bank | 2000 | 198 | Private commercial bank | Private | Warm Springs Wetland, LLC |

| State | Corps District | Bank Name | Year Established | Total Acreage | Bank Type | Bank Sponsor Type | Bank Sponsor |
|---|---|---|---|---|---|---|---|
| | | WetBank -- Gunnison | 1999 | 109 | Private commercial bank | Private | Still Water -- Ohio Creek, LLP |
| **Florida** | | | | | | | |
| | Jacksonville | | | | | | |
| | | American Equities Mitigation Land Bank at Reedy Creek | 1997 | 2993 | Private commercial bank | Private | American Equities #7 Ltd. |
| | | Barberville Conservation Area Mitigation Bank | 1996 | 366 | Public commercial bank | Public | Volusia County |
| | | Big Cypress Mitigation Bank | | 1280 | Private commercial bank | Private | Ruby Red Equities Limited Partnership |
| | | Bluefield Ranch Mitigation Bank | 2001 | 2675 | Private commercial bank | Private | |
| | | Boran Ranch Mitigation Bank | 1997 | 237 | Private commercial bank | Private | James E. Moore, III |
| | | Cheval Tournament Players Club | | | Single-user bank | Private | Cheval Associates Partnerships, Inc. |
| | | CGW Mitigation Bank | 1998 | 150 | Private commercial bank | Private | Chown, Gregory, Wilcox |
| | | Colbert-Cameron Mitigation Bank | 1996 | 2604 | Private commercial bank | Private | Stenstrom, IcIntosh, Colbert, Whigham and Simmons |
| | | East Central Florida Regional Mitigation Bank | 1996 | 1061 | Private commercial bank | Private | Ecosystems Land Mitigation Bank II Corporation |
| | | Everglades Mitigation Bank- Phase I | 1996 | 4215 | Single-user bank | Public | Florida Power and Light Company |
| | | Farmton Mitigation Bank | 2000 | 23922 | Private commercial bank | Private | Miami Corporation |
| | | Florida Mitigation Bank | 1997 | 1582 | Private commercial bank | Private | D&J Ranch Inc. |
| | | Florida Wetlandsbank | 1995 | 420 | Private commercial bank | Private | Florida Wetlandsbank |
| | | Garcon Peninsula Mitigation Bank | 2001 | 337 | Private commercial bank | Private | Joe Edmisten, Inc. and Associates |
| | | Graham Swamp Mitigation Bank | 1996 | 66 | Private commercial bank | Private | ITT Community Development Corporation |
| | | Hillsborough County Utilities Department Mitigation Bank | | | Single-user bank | Public | Hillsborough County Utilities Department |
| | | Lake Louisa and Green Swamp | 1995 | 1007 | Private commercial bank | Private | Ecosystems Land Mitigation Corporation |
| | | Lake Monroe Mitigation Bank | 1995 | 603 | Single-user bank | Public | Florida Department of Transportation |
| | | Little Pine Island Mitigation Bank | 1996 | 1264 | Private commercial bank | Private | Mariner Properties Development, Inc. |
| | | Loxahatchee Mitigation Bank | 2000 | 1264 | Private commercial bank | Private | Foster Wheeler Environmental Corporation |
| | | Marion I Sustainable Mitigation Project | | | Single-user bank | Private | Environmental Management Systems, Inc. |
| | | Northeast Florida Mitigation Bank | 1995 | 630 | Private commercial bank | Private | Mitigation Solutions, Inc. |

| State | Corps District | Bank Name | Year Established | Total Acreage Type | Bank Type | Bank Sponsor | Bank Sponsor |
|---|---|---|---|---|---|---|---|
| | | Northlakes Park Mitigation Bank | | | Single-user bank | Public | Hillsborough County |
| | | Panther Island Mitigation Bank | | 2778 | Private commercial bank | Private | South Florida Wetlands Joint Venture |
| | | Polk Parkway Bank | | | Single-user bank | Public | Polk County |
| | | Polk Regional Drainage Project Bank | | | Single-user bank | Public | Polk County |
| | | Southeast Mitigation Bank | | | Single-user bank | Public | Hillsborough County |
| | | Split Oak Mitigation Bank | 1996 | 1049 | Public commercial bank | Public | Orange County Board of County Commissioners |
| | | Sundew Mitigation Bank | 2001 | 2170 | Private commercial bank | Private | Cheyenne Environmental LLC |
| | | Tampa Bay Wetland Bank | 2001 | 161 | Public commercial bank | Private | Tampa Bay Mitigation, L.L.C. |
| | | Tosohatchee Mitigation Bank | | 1312 | Single-user bank | Public | Florida Department of Transportation |
| | | Treyburn/Collier Mitigation Bank | | 637 | Private commercial bank | Private | Florida Wetlands Stewardship Group, Inc. |
| | | Turner Citrus, Inc. | | | Single-user bank | Private | Gene Turner |
| | | Weisenfeld Mitigation Bank | 1990 | 235 | Private commercial bank | Private | |
| **Georgia** | | | | | | | |
| | Savannah | | | | | | |
| | | Bazemore Mitigation Bank | 1998 | 228 | Single-user bank | Public | Georgia Department of Transportation |
| | | Bowen Mill Pond Mitigation Bank | 1997 | 444 | Single-user bank | Public | Georgia Department of Transportation |
| | | Burke County Mitigation Bank | 1998 | 80 | Single-user bank | Public | Georgia Department of Transportation |
| | | Callaway Farms Mitigation Bank | 1998 | 116 | Private commercial bank | Private | Callaway Lakes L.P |
| | | Cecil Bay/Heart Pine Pond Mitigation Bank | 1999 | 912 | Private commercial bank | Private | Williams Investment Company |
| | | Chattahoochee Mitigation Bank | 2002 | 94 | Private commercial bank | Private | Richfield Development Corporation |
| | | Cherry Creek Mitigation Bank | 2000 | 530 | Private commercial bank | Private | Creative Environmental Solutions, Inc. |
| | | Etowah River Mitigation Preserve | 2000 | 173 | Public commercial bank | Public | Dawson County Commissioners |
| | | Etowah River Stream Mitigation Bank | 2001 | 22 | Private commercial bank | Private | Etowah Ridge Development, LLC |
| | | Fort Stewart Mitigation Bank | 2000 | 1080 | Public bank | Public | U.S. Army |
| | | Hartsfield Atlanta Airport Mitigation Bank | 1999 | 56 | Single-user bank | Public | Hartsfield Atlanta International Airport |
| | | Holy Ghost Mitigation Bank | 1996 | 481 | Private commercial bank | Private | W.E.T., Inc. |
| | | Indian Creek Wetland Mitigation Bank | 2000 | 380 | Single-user bank | Private | Suwannee River Mitigation Technologies, LLC |
| | | Marshlands Plantation, Inc. Mitigation Bank | 1996 | 137 | Private commercial bank | Private | Marshlands, Inc. |
| | | Millhaven Mitigation Bank | 1992 | 350 | Private commercial | Private | W.E.T. ,Inc |

| State | Corps District | Bank Name | Year Established | Total Acreage | Bank Type | Bank Sponsor Type | Bank Sponsor |
|---|---|---|---|---|---|---|---|
| | | Montezuma Mitigation Site | 1998 | 107 | Single-user bank | Public | Georgia Department of Transportation |
| | | Moreland Place Bottom Mitigation Bank | 2000 | 40 | Private commercial bank | Private | Juanita Bridges |
| | | Mulberry River Mitigation Bank | 2000 | 68 | Private commercial bank | Private | Mr. Gerald Hudgins |
| | | Ogeechee River Mitigation Bank | 1999 | 294 | Private commercial bank | Private | GJ - Georgia Properties, Inc. |
| | | Old Thorn Pond Mitigation Bank | 1998 | 450 | Private commercial bank | Private | Old Thorn Pond, LLC |
| | | Phinizy Swamp Wetland Mitigation Bank (Merry Land | 2000 | 3047 | Private commercial bank | Private | Merry Land Properties, Inc. |
| | | Pine South Wetland Mitigation Bank | 2000 | 124 | Private commercial bank | Private | PineSouth, Inc. |
| | | Prater Island Mitigation Bank | 2001 | 104 | Single-user bank | Public | Georgia Department of Transportation |
| | | Raleigh Joyce Tract Wetland Mitigation Bank | 1998 | 881 | Single-user bank | Public | Georgia Department of Transportation |
| | | Satilla River Wetland Mitigation Bank | 1996 | 88 | Private commercial bank | Private | Spivey Mitigation Technologies, Inc. |
| **Iowa** | | | | | | | |
| | Rock Island | | | | | | |
| | | G. William Coulthard Wetland Mitigation Bank | 2000 | 46 | Private commercial bank | Private | Coulthard Farms |
| | | Iowa Wetland Mitigation Bank (Coulter Marsh Agricultural | 2000 | 98 | Private commercial bank | Private | Iowa Wetland Mitigation Bank, Inc. |
| **Idaho** | | | | | | | |
| | Walla Walla | | | | | | |
| | | Georgetown Mitigation Bank | 1996 | 77 | Single-user bank | Public | Idaho Transportation Department. |
| | | Old Beaver Mitigation Bank | 1988 | 36 | Single-user bank | Public | Idaho Department of Transportation |
| **Illinois** | | | | | | | |
| | Chicago | | | | | | |
| | | Bank 1 (Wetlands Research, Inc) | 1995 | 52 | Private commercial bank | Private | Wetlands Research, Inc. |
| | | Bank 2 (Wetlands Research, Inc) | 1996 | 62 | Private commercial bank | Private | Wetland Research, Inc. |
| | | Big Sag Wetland Conservancy | 2001 | 127 | Private commercial bank | Private | EcoLogic Planning, Inc. |
| | | Butterfield Road Wetland Mitigation Bank | 1999 | 56 | Private commercial bank | Private | Land and Water Resources, Inc. |
| | | Cornerstone | | 27 | | not specified | |
| | | Cricket Creek | 1994 | 20 | Public commercial bank | Public | County of DuPage, Department of Environmental Concerns |
| | | Des Plaines - Towpath Canal Wetland Mitigation Bank | 2001 | 40 | Private commercial bank | Private | Ecologic Planning, Inc. |
| | | Downer's Grove | | 11 | | | |
| | | Ferson Creek Wetland Bank | 1996 | 82 | Private commercial | Private | Land and Water Resources |

| State | Corps District | Bank Name | Year Established | Total Acreage | Bank Type | Bank Sponsor Type | Bank Sponsor |
|---|---|---|---|---|---|---|---|
| | | Girl Scout Sybaquay Council Mitigation Bank | 2001 | 47 | Private commercial bank | Private Nonprofit | Girl Scouts - Sybaquay Council, Inc. |
| | | Hanover Park Mitigation Area | 1998 | 14 | Private commercial bank | Private | Land and Water Resources, Inc. |
| | | Kishwaukee River Bottoms Wetland Mitigation Bank | 2000 | 30 | Private commercial bank | Private | Ecological Planning, Inc. |
| | | Knollwood Mitigation Bank | | 9 | | | |
| | | LRH Partnership Marengo Mitigation Bank | 1997 | 80 | Private commercial bank | Private | LRH Partnership |
| | | North Glen Ellyn | | 10 | | | |
| | | Otter Creek Mitigation Bank | 1994 | 46 | Private commercial bank | Private | Land and Water Resources, Inc. |
| | | Prairie Creek | 1998 | 45 | Single-user bank | Private | Vulcan Materials Company |
| | | Sauk Trail Wetland Mitigation Bank | 1998 | 66 | Private commercial bank | Private | Encorp, LTD and EcoLogic Planning, Inc. |
| | | Slough Creek Wetland Mitigation Bank | 1997 | 31 | Private commercial bank | Private | Northern IL Land Preserve, Inc. and EcoLogic, Inc. |
| | Rock Island | | | | | | |
| | | Dekalb County Forest Preserve | 1999 | 58 | Public commercial bank | Public | DeKalb County Forest Preserve District |
| | | Kilbuck Creek Wetland Mitigation Bank | 1998 | 66 | Private commercial bank | Private | Land and Water Resources, Inc. |
| **Indiana** | | | | | | | |
| | Detroit | | | | | | |
| | | Lake Station Wetland Mitigation Bank | 2000 | 202 | Private commercial bank | Private | Lake Erie Land Company |
| | Louisville | | | | | | |
| | | Geist Reservoir Mitigation Bank | 1990 | 15 | Single-user bank | Private | Shorewood Corporation |
| | | Morse Reservoir Wetland Mitigation Bank | 1990 | 40 | Single-user bank | Private | Shorewood Corporation |
| | | Schroeder Mitigation Bank | 1999 | 36 | Private commercial bank | Private | Gary W. Schroeder |
| **Kansas** | | | | | | | |
| | Kansas City | | | | | | |
| | | Johnson County Wetlands Mitigation Bank | 1999 | 62 | Combo pub/private commercial bank | CombinationPublic/Private | Johnson County Wetlands Mitigation Bank, L.L.C. |
| **Kentucky** | | | | | | | |
| | Louisville | | | | | | |
| | | G & L Mitigation Bank | 1998 | 47 | Private commercial bank | Private | G&L |
| | | Nelson County Wetland Mitigation Bank Number One | 1997 | 114 | Private commercial bank | Private | PTRL Environmental Services |
| | | Pond Creek Water Storage/Wetland Mitigation Bank | 1998 | 11 | Private commercial bank | Private | PTRL Environmental Services |
| | | Wetland Bank of Kentucky | 1998 | 96 | Private commercial | Private | Highview Engineering, Inc. |

| State | Corps District | Bank Name | Year Established | Total Acreage | Bank Type | Bank Sponsor Type | Bank Sponsor |
|---|---|---|---|---|---|---|---|
| **Louisiana** | | | | | | | |
| | New Orleans | | | | | | |
| | | Tenneco LaTerre Mitigation Bank | 1984 | 7014 | Single-user bank | Private | Tenneco Oil Company |
| | Vicksburg | | | | | | |
| | | Honey Island Swamp Mitigation Bank | 2001 | 97 | Private commercial bank | Private | TXI Operations, LP |
| | | Red River Mitigation Bank | 2001 | 45 | Private commercial bank | Private | Poirrier and Poirrier Development, Inc. |
| **Missouri** | | | | | | | |
| | Memphis | | | | | | |
| | | Southeast Missouri Agricultural Wetland Mitigation Bank | 1999 | 73 | Private commercial bank | Private Nonprofit | Agriculture Conservation Innovation Center |
| | St. Louis | | | | | | |
| | | Big Rivers Wetland Mitigation Bank | 1999 | 110 | Private commercial bank | Private | Mid River Wetland Restoration |
| | | Fox Creek Stream Mitigation Bank | 2000 | 93 | Private commercial bank | Private | Don Breckenridge |
| | | Lower Missouri River Mitigation Bank | 1999 | 16 | Private commercial bank | Private | The Jones Company |
| | | Rosedale Wetland Mitigation Bank | 2000 | 44 | Private commercial bank | Private | Rosedale Mitigation, LLC |
| | | Westwinds Wetland Mitigation Bank | 1999 | 70 | Private commercial bank | Private | Westwinds Farms |
| **Mississippi** | | | | | | | |
| | Mobile | | | | | | |
| | | Mississippi Wetlands Bank | 2000 | 1404 | Private commercial bank | Private | Wetlands Solutions, L.L.C. |
| | | Old Fort Bayou Mitigation Bank | 1997 | 1730 | Private commercial bank | Public | The Nature Conservancy |
| | Vicksburg | | | | | | |
| | | Pearl River Mitigation Bank | 2001 | 350 | Private commercial bank | Private | BL Properties, L.L.C. |
| | | Stennis Space Center Mitigation Bank | 1996 | 130 | Single-user bank | Public | NASA |
| | Vicksburg | | | | | | |
| | | Delta Mitigation Bank | 2001 | 610 | Private commercial bank | Private | Greenhead Farms, LLC |
| **North Carolina** | | | | | | | |
| | Wilmington | | | | | | |
| | | Barra Farms Cape Fear Regional Mitigation Bank | 1999 | 623 | Private commercial bank | Private | Ecosystems Land Mitigation Bank Corporation |
| | | Flat Swamp Wetland Mitigation and Stream Restoration Bank | 2000 | 386 | Private commercial bank | Private | Mr. Douglas J Frederick |

| State | Corps District | Bank Name | Year Established | Total Acreage | Bank Type | Bank Sponsor Type | Bank Sponsor |
|---|---|---|---|---|---|---|---|
| | | Greater Sandy Run Mitigation Bank | 1999 | 1250 | Single-user bank | Public | U.S. Marine Corps |
| | | Hidden Lake Wetland Mitigation Bank | 1998 | 818 | Private commercial bank | Private | Hidden Lake, LLC and Big Pine, LLC |
| | | Scuppernong River Corridor Wetland Mitigation Bank | 1998 | 38 | Private commercial bank | Private | Triangle Group |
| **North Dakota** | | | | | | | |
| | Omaha | | | | | | |
| | | North Dakota | 1975 | | Single-user bank | Public | North Dakota Department of Transportation |
| | | Omaha Vollrath Mitigation Bank | 2001 | 405 | Single-user bank | Public | North Dakota Department of Transportation |
| **Nebraska** | | | | | | | |
| | Omaha | | | | | | |
| | | Hobson Yard Wetland Mitigation Bank | 1997 | 229 | Single-user bank | Private | Burlington Northern |
| | | North Platte Wetland Mitigation Bank | 2000 | 25 | Public commercial bank | Public Commercial | City of North Platte, Nebraska |
| **New Jersey** | | | | | | | |
| | New York | | | | | | |
| | | Bog Brook Wetlands Enhancement Bank | 1995 | 7 | Single-user bank | Private | Transcontinental Gas Pipeline Corporation |
| | | C&C Builders Wetland Mitigation Bank Phase I | 1998 | 187 | Single-user bank | Private | C&C Builders LLC |
| | | Marsh Resources Inc. Meadowlands Mitigation Bank | 1999 | 206 | Private commercial bank | Private | Marsh Resources, Inc. |
| | | Pio Costa Wetlands Mitigation Bank | 1995 | 158 | Private commercial bank | Private | Anthony Pio Costa |
| | | Willow Grove Lake Wetlands Mitigation Bank | 1994 | 1073 | Public commercial bank | Private Nonprofit | The Nature Conservancy |
| | | Woodbury Creek Wetlands Mitigation Bank | 1995 | 92 | Private commercial bank | Private | U.S. Wetland Services |
| | | Wyckoff's Mills Wetland Mitigation Bank | 1997 | 146 | Private commercial bank | Private | Millstone River Wetlands Services, Inc. |
| **New York** | | | | | | | |
| | Buffalo | | | | | | |
| | | Rochester's Cornerstone Group-Rochester International | 1998 | 20 | Private commercial bank | Private | Rochester's Cornerstone Group-Rochester International Commerce Center LLC |
| **Ohio** | | | | | | | |
| | Buffalo | | | | | | |
| | | Grand River Lowlands and Cherry Valley Mitigation Sites | 1999 | 445 | Private commercial bank | Private | Wetlands Preservation, Ltd. |
| | | Ohio Edison Grand River | 1996 | 42 | Private commercial | Private | Ohio Edison Company |

| State | Corps District | Bank Name Established | Year | Total Acreage | Bank Type | Bank Sponsor | Bank Sponsor |
|---|---|---|---|---|---|---|---|
| | Mitigation Bank | | | bank | | | |
| | Sandy Ridge Mitigation Site | 1996 | 115 | Private commercial bank | Private Nonprofit | Ohio Wetlands Foundation | |
| | Three Eagles Mitigation Site | 1999 | 158 | Private commercial bank | Private Nonprofit | Ohio Wetlands Corporation | |
| | Trumbull Creek Mitigation Site | 2000 | 462 | Single-user bank | Private | Ohio Wetlands Corporation | |
| | Huntington | | | | | | |
| | Big Island | 1994 | 350 | Combo pub/private commercial bank | Combo Public/ Private | Ohio Wetlands Foundation | |
| | Hebron Mitigation Bank | 1993 | 33 | Combo pub/private commercial bank | Combo Public/ Private | Ohio Wetlands Foundation | |
| | Little Scioto River Mitigation Site | 1999 | 500 | Combo pub/private commercial bank | Combo Public/ Private | Wetland Resource Center LLC | |
| | Panzner Wetland Wildlife Reserve Mitigation Bank | 1999 | | Private commercial bank | Private | Panzner & Sons, Inc. | |
| | Slate Run Mitigation Site | 1999 | 156 | Combo pub/private commercial bank | Combo Public/ Private | Ohio Wetlands Foundation | |
| **Oregon** | | | | | | | |
| | Portland | | | | | | |
| | Marion Mitigation Bank | 2001 | 59 | Private commercial bank | Private | | |
| | Mud Slough Wetland Mitigation Bank | 2000 | 56 | Private commercial bank | Private | Mark and Deborah Knaupp | |
| | Oak Creek Mitigation Bank | 1999 | 88 | Private commercial bank | Private | Oak Creek Mitigation Bank LLC | |
| | Weathers' Wetland Mitigation Bank | 1998 | 61 | Private commercial bank | Private | Harley and Emily Weathers, and Don Causey | |
| | Winmar (Catellus) Mitigation Bank | 1995 | 21 | Private commercial bank | Private | Windmar Pacific, Inc. | |
| **South Carolina** | | | | | | | |
| | Charleston | | | | | | |
| | Black River Bottomland Hardwoods Mitigation Bank | 1998 | 82 | Private commercial bank | Private | Ecological Associates Inc. | |
| | Black River Mitigation Bank | 1997 | 1709 | Single-user bank | Public | South Carolina Department of Transportation | |
| | Friends Neck Wetland Mitigation Bank | 1995 | 395 | Private commercial bank | Private | Mr. C. Heath Manning, Manning Company | |
| | Huspa Creek Wetland Mitigation Bank | 1997 | 232 | Single-user bank | Public | South Carolina Department of Transportation | |
| | Playcard II Mitigation Bank | | 54 | Private commercial bank | Private Nonprofit | Horry County Conservation Foundation, Inc. | |
| | Playcard Mitigation Bank | 1997 | 104 | Private commercial bank | Private Nonprofit | Horry County Conservation Foundation, Inc. | |
| | Richland County Broad River Mitigation Bank | 1997 | 164 | Single-user bank | Public | Richland County | |
| | Sandy Island Mitigation Bank | 1996 | 16826 | Single-user bank | Public | South Carolina Department of Transportation | |

| State | Corps District | Bank Name | Year Established | Total Acreage | Bank Type | Bank Sponsor Type | Bank Sponsor |
|---|---|---|---|---|---|---|---|
| | | Swallow Savannah Mitigation Bank | 1997 | 185 | Private commercial bank | Private | IB Lawton, Jr. and D.E. Gatlin |
| | | Vandross Bay Mitigation Bank | 1994 | 804 | Private commercial bank | Private | Combahee Land Company |
| **Tennessee** | | | | | | | |
| | Memphis | | | | | | |
| | | Madison County Wetland Mitigation Bank Site Plan | 1996 | 778 | Single-user bank | Public | Tennessee Department of Transportation |
| | | Obion Wetland Mitigation Bank Site Plan | 2000 | 397 | Single-user bank | Public | Tennessee Department of Transportation |
| | | Wolf River Wetland Mitigation Bank | 1997 | 769 | Private commercial bank | Private | U.S. Wetlands Services, L.L.C. |
| | Nashville | | | | | | |
| | | Coffee County Wetland Mitigation Bank | 1995 | 1200 | Private commercial bank | Private Nonprofit | National Ecological Foundation |
| | | Harpeth Wetland Mitigation Bank | 1998 | 232 | Private commercial bank | Private | Harpeth Wetland Bank, LLC |
| | | Shady Valley Wetland Mitigation Bank | 1997 | 137 | Private commercial bank | Private Nonprofit | The Nature Conservancy |
| **Texas** | | | | | | | |
| | Fort Worth | | | | | | |
| | | Anderson Tract Mitigation Bank | 1994 | 2243 | Single-user bank | Public | Texas Parks and Wildlife Department |
| | | Byrd Tract Mitigation Bank | 1998 | 483 | Single-user bank | Private | Enron Oil and Gas Company |
| | | Hawkins Mitigation Bank | 1998 | 175 | Single-user bank | Private | R. Lacy, Inc. |
| | | Klamm Mitigation Bank | 1998 | 1251 | Private commercial bank | Private | KLAMM Inc |
| | | Trinity River Mitigation | 2001 | 1380 | Private commercial bank | Private | Wetland Partners |
| | Galveston | | | | | | |
| | | Blue Elbow Swamp Mitigation Bank | 1995 | 3343 | Single-user bank | Public | Texas Department of Transportation |
| | | Coastal Bottomlands Mitigation Bank | 1999 | 3552 | Single-user bank | Public | Texas Department of Transportation |
| | | Greens Bayou Wetland | 1995 | | Private commercial bank | Private | Harris County Flood Control District |
| | | Katy-Cypress Wetland Mitigation Bank | 1996 | 483 | Private commercial bank | Private | Lieven J. Van Riet |
| | | Neches River Cypress Swamp Preserve | 1999 | 541 | Private commercial bank | Private | Wetlands Mitigation Replacement of Southeast Texas |
| | | Palacios Wetland Mitigation Bank | 2000 | 629 | Private commercial bank | Private | Oak Meadows, Inc. |

| State | Corps District | Bank Name | Year Established | Total Acreage | Bank Type | Bank Sponsor Type | Bank Sponsor |
|---|---|---|---|---|---|---|---|
| **Utah** | | | | | | | |
| | Sacramento | | | | | | |
| | | Bailey's Meadow Mitigation Bank | 1999 | 96 | Private commercial bank | Private | Diversified Habitats |
| | | Inland Sea Shorebird Reserve Bank | 1997 | 3879 | Private commercial bank | Private | Kencott Utah Copper Corporation |
| | | Rainey Mitigation Bank | 1998 | 48 | Private commercial bank | Private | Diversified Habitats, LLC |
| | | Seifert Mitigation Bank | 1996 | 52 | Private commercial bank | Private | Diversified Habitats, LLC |
| **Virginia** | | | | | | | |
| | Norfolk | | | | | | |
| | | Cedar Run Wetlands Bank | 2000 | 310 | Single-user bank | Private | Cedar Run Wetlands, L.L.C. |
| | | Chickahominy Environmental Bank | 2000 | 296 | Private commercial bank | Private | Gray Cole, LLC |
| | | James River Mitigation Landbank | 1998 | 430 | Private commercial bank | Private | James River Wetland Mitigation Landbank, LLC |
| | | Mattaponi Wetland Bank | 2001 | 69 | Single-user bank | Public | Virginia Department of Transportation |
| | | Neabsco Wetland Bank (Julie J. Metz) | 1994 | 233 | Private commercial bank | Private | Wetlands Studies and Solutions, Inc. |
| | | North Fork Wetland Bank | 1999 | 125 | Private commercial bank | Private | North Forks Wetlands Bank, L.L.C. |
| | | ODEC - Virginia Power Wetland Mitigation Bank | 1997 | 6 | Private commercial bank | Private | Old Dominon Electric Cooperative |
| | | Shenandoah Wetland Bank | 2001 | 103 | Private commercial bank | Private | POC - Willamsburg Environmental |
| | | Virginia Department of Transportation Goose Creek Bank | 1982 | 11 | Single-user bank | Public | Virginia Department of Transportation |
| | | White Cedar Mitigation Bank | 1995 | 273 | Single-user bank | Private | White Cedar, LLC |
| **Washington** | | | | | | | |
| | Seattle | | | | | | |
| | | McHugh Wetland Mitigation Bank | 2000 | 6 | Single-user bank | Public | Joe McHugh |
| | | Meadowland Wetland Mitigation Bank | 1997 | | Private commercial bank | Private | James Dutro |
| **Wisconsin** | | | | | | | |
| | St Paul | | | | | | |
| | | Cutler Cranberry Company | 1993 | 103 | Private commercial bank | Private | Cutler Cranberry Company |
| | | Patrick Lake Wetland Mitigation Bank | 1989 | 160 | Single-user bank | Public | Wisconsin Department of Transportation |
| | St. Paul | | | | | | |
| | | Dane County Wetland Mitigation Bank (Lodi Site) | 1998 | 64 | Single-user bank | Public | Dane County Regional Airport (DCRA) |

| State | Corps District | Bank Name | Year Established | Total Acreage | Bank Type | Bank Sponsor Type | Bank Sponsor |
|---|---|---|---|---|---|---|---|
| | | Northland Cranberries Wetland Mitigation Bank | 1999 | 156 | Private commercial bank | Private | Northland Cranberries, Inc. |
| | | Wisconsin Waterfowl Association Bank (Walkerwin Bank) | 1996 | 130 | Private commercial bank | Private | Wisconsin Waterfowl Associates Wetland Mitigation Group, LLC |

# APPENDIX G: UMBRELLA MITIGATION BANKS – DATA

All approved umbrella bank agreements in the country are grouped by state and further organized according to Corps district. The year the bank was formally established (received official signatures) is indicated. The total acreage approved is the total number of acres approved for mitigation. Each umbrella bank agreement is categorized as single-user, public commercial, private commercial, private non-profit, combination public-private commercial, or public. The agreement sponsor is the entity responsible for credit production. Blank spaces indicate that the information was not available. Data is current through December 2001.

| State | Corps District | Agreement Name | Date Established | Number of Sites | Total Acreage Approved | Agreement Type | Agreement Sponsor |
|---|---|---|---|---|---|---|---|
| **Alabama** | | | | | | | |
| | Mobile | | | | | | |
| | | Alabama Department of Transportation Bank | 1996 | 5 | 1,310 | Single-user | Alabama Department of Transportation |
| **Arkansas** | | | | | | | |
| | Vicksburg and Memphis | | | | | | |
| | | Arkansas State-Sponsored Wetlands Mitigation Bank | 1998 | 1 | 320 | Public commercial | Arkansas Soil and Water Conservation Commission |
| **Georgia** | | | | | | | |
| | Savannah | | | | | | |
| | | The Streambank (North Georgia Regional Rivers & Streams Mitigation Project) | 2000 | 0 | 0 | Private commercial | Save Our Streams LLC |
| **Louisiana** | | | | | | | |
| | New Orleans | | | | | | |
| | | Interagency Agreement: The Nature Conservancy Longleaf Pine Flatwood/Savanna | 2000 | 2 | 246 | Private non-profit | The Nature Conservancy of Louisiana |
| | | Mitigation Banks | | | | | |
| | | Southeast Louisiana Pine Flatwood Wetland Mitigation Bank | 1991 | 3 | 2,799 | Private non-profit | The Nature Conservancy of Louisiana |
| **Massachusetts** | | | | | | | |
| | New England | | | | | | |
| | | Massachusetts Pilot Wetlands Banking Project | Jan. 30, 1998 | 0 | 0 | Public commercial | Commonwealth of Massachusetts |

| State | Corps District | Agreement Name | Date Established | Total Sites | Total Acres | Agreement Type | Agreement Sponsor |
|---|---|---|---|---|---|---|---|
| **Maryland** | | | | | | | |
| | Baltimore | | | | | | |
| | | Maryland State Highway Administration | 1993 | 0 | 0 | Single-user | Maryland State Highway Administration |
| | | Prince George's County Wetland Banking System | Oct. 11, 1994 | 0 | 0 | Single-user | Prince George's County Government and The Maryland-National Capital |
| **Michigan** | | | | | | | |
| | Detroit | | | | | | |
| | | Wayne County Wetland Mitigation Bank | 1999 | 9 | 21.5 | Public commercial | Wayne County |
| **Minnesota** | | | | | | | |
| | St. Paul | | | | | | |
| | | Minnesota Department of Transportation Mitigation Banking System | 1993 | 173[1] | 4,200.58[2] | Public commercial | Minnesota Board of Water & Soil Resources |
| **Mississippi** | | | | | | | |
| | Mobile and Vicksburg Districts | | | | | | |
| | | South Mississippi Mitigation Bank | Jan. 21, 2000 | 3 | 1,421 | Private commercial | Little Biloxi Wetland Trust, Inc. |
| | Vicksburg | | | | | | |
| | | Argyle, Inc. Mitigation Banking Program Agreement | Dec. 28, 2000 | 0 | 0 | Private commercial | Argyle, Inc. |
| | | Mississippi Band of Choctaw Indians Mitigation Banking Program Agreement | | 1 | 50 | Single-user | Mississippi Band of Choctaw Indians<br>Phillip Martin, Tribal Chief |
| | | Mississippi Highway Department Mitigation Bank | Oct. 25, 1999 | 5 | 5,694 | Single-user | Mississippi State Highway Department |
| **North Carolina** | | | | | | | |
| | Wilmington | | | | | | |
| | | Neu-Con Umbrella Mitigation Bank | Mar. 2001 | 1 | 0 | Private commercial | Environmental Banc & Exchange, L.L.C. |
| | Wilmington and Norfolk | | | | | | |
| | | Great Dismal Swamp Restoration Bank Umbrella MOA | Aug. 1997 | 1 | 4,000 | Private commercial | Great Dismal Swamp Restoration Bank, LLC |

[1] BWSR = 134 sites, MN DOT = 39 sites
[2] BWSR = 2,431.08 acres, MN DOT = 1,769.5 acres

| State | Corps District | Agreement Name | Date Established | Total Sites | Total Acres | Agreement Type | Agreement Sponsor |
|---|---|---|---|---|---|---|---|
| **Nebraska** | | | | | | | |
| | Omaha | | | | | | |
| | | Nebraska Department of Roads Wetland Mitigation Bank | July 1997 | 16 | 1,000 | Single-user | Nebraska Department of Roads |
| **Nevada** | | | | | | | |
| | Sacramento | | | | | | |
| | | Clark County Mitigation Bank | Dec. 2000 | 0 | 0 | Public commercial | Clark County, Nevada |
| **Ohio** | | | | | | | |
| | Buffalo and Huntington | | | | | | |
| | | North Coast Regional Wetland and Stream Mitigation Bank | Dec. 2001 | 6 | 288.4 | Public commercial | North Coast Regional Council of Park Districts |
| **Oklahoma** | | | | | | | |
| | Tulsa | | | | | | |
| | | Oklahoma Department of Transportation Memorandum of Agreement | Dec. 1996 | 0 | 0 | Single-user | Oklahoma Department of Transportation |
| **Oregon** | | | | | | | |
| | Portland | | | | | | |
| | | West Eugene Wetlands Plan | Nov. 1995 | 13 | 70 | Public commercial | City of Eugene |
| **Pennsylvania** | | | | | | | |
| | Baltimore | | | | | | |
| | | Interagency Agreement Advance Wetland Compensation PennDOT District 3-0 | July 17, 1997 | 2 | 45 | Single-user | Pennsylvania Department of Transportation, Engineering District 3-0 |
| | Baltimore and Pittsburgh | | | | | | |
| | | Interagency Agreement Advance Wetland Compensation PennDOT District 2-0 | Jan. 13, 2000 | 0 | 0 | Single-user | Pennsylvania Department of Transportation, Engineering District 2-0 |
| | | Interagency Agreement Advance Wetland Compensation PennDOT District 9-0 | Dec. 21, 1995 | 5 | 65.5 | Single-user | Pennsylvania Department of Transportation, Engineering District 9-0 |
| | Pittsburgh | | | | | | |
| | | Interagency Agreement Advance Wetland Compensation PennDOT District 12-0 | June 11, 2001 | 0 | 0 | Single-user | Pennsylvania Department of Transportation, Engineering District 12-0 |
| **South Carolina** | | | | | | | |
| | Charleston | | | | | | |
| | | Memorandum of Agreement for the Savannah River Site | Jan. 1, 1997 | 0 | 0 | Single-user | U.S. Department of Energy-Savannah River Operations Office |

| State | Corps District | Agreement Name | Date Established | Total Sites | Total Acres | Agreement Type | Agreement Sponsor |
|---|---|---|---|---|---|---|---|
| **South Dakota** | | | | | | | |
| | Omaha | | | | | | |
| | | Wetland Accounting System | Oct. 1988 | 11 | 181.2 | Single-user | South Dakota Department of Transportation |
| **Tennessee** | | | | | | | |
| | Memphis | | | | | | |
| | | Tennessee Department of Transportation Umbrella Bank | 1995 | 2 | 1,145.3 | Single-user | Tennessee Department of Transportation |
| **Virginia** | | | | | | | |
| | Norfolk | | | | | | |
| | | Davis Wetland Bank | Nov. 4, 1998 | 1 | 453 | Private commercial | Davis Wetland Bank, L.L.C. |
| | | Hampton Road Airport Mitigation Bank | July 26, 2000 | 1 | 624[3] | Private commercial | Hampton Roads Airport Mitigation Bank, L.L.C. |
| | | James River Wetland Mitigation Bank Memorandum of Agreement | Mar. 5, 1999 | 2 | 70.4 | Private commercial | James River Mitigation Technologies, L.L.C. |
| | | Lower James River Wetland Mitigation Bank | June 5, 2001 | 1 | 45.84 | Private commercial | James River, L.L.C. |
| | | Virginia Beach Wetland Mitigation Banking System Memorandum of Agreement | June 24, 1994 | 1 | 70.3 | Single-user | City of Virginia Beach, Virginia |
| | Wilmington and Norfolk | | | | | | |
| | | Great Dismal Swamp Restoration Bank | Aug. 1997 | 0 | 0 | Private commercial | Great Dismal Swamp Restoration Bank, L.L.C. |
| **Washington** | | | | | | | |
| | Seattle | | | | | | |
| | | King County Wetland Mitigation Banking Program | Jan. 1999 | 1 | 8 | Public commercial | King County |
| | | Pierce County Public Works and Utilities Road Dept. Mitigation Banking Program | Jan. 1994 | 12 | 14 | Single-user | Pierce County Public Works |
| | | Snohomish County Airport Wetland Compensation Bank Program | July 1, 1996 | 2 | 87 | Public commercial | Snohomish County Airport |
| | | Washington DOT Wetland Compensation Bank Program | Sept. 1994 | 1 | 10 | Single-user | Washington State Department of Transportation |

[3] This figure includes 445 preservation acres.

| State | Corps District | Agreement Name | Date Established | Total Sites | Total Acres | Agreement Type | Agreement Sponsor |
|---|---|---|---|---|---|---|---|
| **Wisconsin** | | | | | | | |
| | St. Paul | | | | | | |
| | | Wisconsin Department of Transportation Wetland Mitigation Banking Technical Guideline - Draft Revision | June 1, 1993 | 21 | 2,008.31 | Single-user | Wisconsin Department of Transportation |
| **Wyoming** | | | | | | | |
| | | Wyoming Statewide Wetland Mitigation Bank | Apr. 1995 | n/a | 600 | Combination public/private | Wyoming Department of Environmental Quality |

# APPENDIX H: IN-LIEU-FEE PROGRAMS - DATA

Below are active in-lieu-fee programs listed by the state in which they operate. Programs that operate in more than one state have the appropriate multi-state jurisdictions indicated. For each program, the following data are listed: the entity that administers each program and sponsors each program; the number of acres/feet lost to generate the required mitigation, the number of acres/feet replaced through completed mitigation projects (restoration, creation, enhancement, or preservation), and the amount of funding collected for each program since inception. Blank fields indicate that the information was not available. Information is current through December 2001. The symbols used in the chart are described below.
# - The Buffalo District has 27 programs and these programs in total permitted the loss of 117 acres, replaced 592 acres, and 16,000 feet. In addition, the sponsors collected a total of $2,806,000.
&- The two Huntington District programs together collected $300,000.
% - The 16 New Orleans District programs together permitted the loss of 5634.44 acres replaced 5646.79 acres.
^ - The SFWMD and Palm Beach County programs are in the process of acquiring large parcels of land from many landowners and this land will then be restored to wetlands. The Palm Beach County program has acquired over 1,000 acres of the 1,700-acre project. The SFWMD program will have 47,000 acres when it is complete.

| State | Administrator | Sponsor | Permitted Acreage | Replaced Acreage | Permitted Feet | Feet Replaced | Funding |
|---|---|---|---|---|---|---|---|
| **AK** | Corps, Alaska District | Great Land Trust | 3.98 | .001 | | | $767,412 |
| **AK** | Corps, Alaska District | The Conservation Fund | | | | | |
| **AK** | Corps, Alaska District | Kachemak Heritage Land Trust | | | | | $57,194 |
| **AK** | Corps, Alaska District | Southeast Alaska Land Trust | | | | | |
| **AZ** | State Agency | Arizona Game and Fish Department | 25 | 0 | 0 | 0 | $153,700 |
| **CA** | Local Agency | Sacramento County | 6.8 | 5.2 | 0 | 0 | $239,624 |

| State | Administrator | Sponsor | Permitted Acreage | Replaced Acreage | Permitted Feet | Feet Replaced | Funding |
|---|---|---|---|---|---|---|---|
| **CA** | Corps, Los Angeles District | Ojai Valley Land Conservancy | 1 | 0 | 0 | 0 | $150,000 |
| **CA** | Corps, Los Angeles District | Mission Resource Conservation District | | | | | |
| **CA** | Corps, Los Angeles District | California Coastal Conservancy | 9.7 | 12 | 0 | 0 | $1,500,000 |
| **CA** | Corps, Los Angeles District | Santa Monica Mountains Conservancy | | | | | |
| **CA (also AZ, CO, NM, NV, TX, UT)** | Corps, South Pacific Division | The National Fish and Wildlife Foundation | 0 | 0 | 0 | 0 | 0 |
| **CA (CO, NV, UT)** | Corps, Sacramento District | The Nature Conservancy | 2 | 2 | 0 | 0 | $88,000 |
| **FL** | State Agency | Palm Beach County | 592.18 | ^ | 0 | 0 | $11,240,733 |
| **FL** | State Agency | South Florida Water Management District | 2,576.52 | ^ | 0 | 0 | $19,529,032 |
| **FL** | State Agency | Department of Environmental Protection or Water Management Districts | 900.55 | 62.58 | 0 | 0 | $62,000,000 |
| **FL** | Corps, Jacksonville District | Audubon of Florida | | | | | $451,147 |

| State | Administrator | Sponsor | Permitted Acreage | Replaced Acreage | Permitted Feet | Feet Replaced | Funding |
|---|---|---|---|---|---|---|---|
| **GA** | Corps, Savannah District | Georgia Environmental Policy Institute | 21.375 | 24 | 0 | 10,000 | $419,258 |
| **ID** | Corps, Walla Walla District | Ducks Unlimited | 1 | 100 | 0 | 0 | $265,000 |
| **ID** | Corps, Walla Walla District | The Nature Conservancy | 4 | 100.8 | 0 | 0 | $140,000 |
| **IL** | Corps, Chicago District | Corporation for Open Lands | 43.3 | 129.5 | 0 | 0 | $2,822,929 |
| **IL** | Local Agency | DuPage County | 2.54 | 0 | 0 | 0 | $712,407.50 |
| **KY** | Corps, Louisville District | Louisville and Jefferson County Metropolitan Sewer District | 0 | 0 | 0 | 0 | $0 |
| **KY** | Corps, Louisville District | Northern Kentucky University | | | | | |
| **LA** | State Agency | Department of Natural Resources | 124 | 0 | 0 | 0 | $980,000 |
| **LA (also MS, AR)** | Corps, Vicksburg District | Delta Environmental Land Trust | | | | | |
| **LA** | Corps, New Orleans District | Gulf Coast Flatwoods | % | 288 | 0 | 0 | |
| **LA** | Corps, New Orleans District | Lago Espanol, LLC | % | 111.47 | 0 | 0 | |
| **LA** | Corps, New Orleans District | South Louisiana Mitigation, LLC | % | 74 | 0 | 0 | |
| **LA** | Corps, New Orleans District | South Louisiana Mitigation, LLC | % | 130 | 0 | 0 | |

| State | Administrator | Sponsor | Permitted Acreage | Replaced Acreage | Permitted Feet | Feet Replaced | Funding |
|---|---|---|---|---|---|---|---|
| **LA** | Corps, New Orleans District | Louisiana Wetlands, LLC | % | 327 | 0 | 0 | |
| **LA** | Corps, New Orleans District | Dixie Environmental Services Company | % | 150 | 0 | 0 | |
| **LA** | Corps, New Orleans District | Bottomland Mitigation Lands, Inc. | % | 230 | 0 | 0 | |
| **LA** | Corps, New Orleans District | Pat Dejean and Arbry Soileau | % | 93 | 0 | 0 | |
| **LA** | Corps, New Orleans District | Nelson, April, and Grant Guillory | % | 65 | 0 | 0 | |
| **LA** | Corps, New Orleans District | Herbert Thomasson | % | 56.32 | 0 | 0 | |
| **LA** | Corps, New Orleans District | Stream Wetland Services, LLC | % | 735 | 0 | 0 | |
| **LA** | Corps, New Orleans District | Louisiana Wetlands, LLC | % | 447 | 0 | 0 | |
| **LA** | Corps, New Orleans District | Gremillion Land Co., LLC | % | 285 | 0 | 0 | |
| **LA** | Corps, New Orleans District | Aurore Ranch | % | 1,000 | 0 | 0 | |
| **LA** | Corps, New Orleans District | A. Wilbert's Sons, LLC | % | 360 | 0 | 0 | |
| **LA** | Corps, New Orleans District | Good Growth Conservancy, Inc. | % | 1,295 | 0 | 0 | |
| **MD** | State Agency | Department of Environment | 71.74 | 162.3 | 0 | 0 | |

| State | Administrator | Sponsor | Permitted Acreage | Replaced Acreage | Permitted Feet | Feet Replaced | Funding |
|---|---|---|---|---|---|---|---|
| **MO** | Corps, Kansas City District | Missouri Conservation Heritage Foundation | 2.18 | 0 | 0 | 0 | $161,194 |
| **MO** | Corps, St. Louis District | Missouri Conservation Heritage Foundation | 0 | 0 | 0 | 0 | 0 |
| **MO (also MS)** | Corps, Little Rock District | Missouri Conservation Heritage Foundation | 2.48 | 0 | 0 | 0 | $69,750 |
| **MO (also MS)** | Corps, Memphis District | Missouri Conservation Heritage Foundation | 0 | 0 | 0 | 0 | 0 |
| **NC** | State Agency | Department of Environment and Natural Resources | 246 | 78.5 | 177,377 | 25,364 | $13,617,375 |
| **NJ** | State Agency | Wetlands Mitigation Council | 25 | 64.1 | 0 | 5,240 | $2,366,409 |
| **NY** | Corps, Buffalo District | The Western New York Land Conservancy | # | # | # | # | # |
| **NY** | Corps, Buffalo District | Save-the-County Land Trust, Inc. | # | # | # | # | # |
| **NY** | Corps, Buffalo District | Town of Brighton | # | # | # | # | # |
| **NY** | Corps, Buffalo District | The Nature Conservancy, Central and Western New York Chapter | # | # | # | # | # |

| State | Administrator | Sponsor | Permitted Acreage | Replaced Acreage | Permitted Feet | Feet Replaced | Funding |
|---|---|---|---|---|---|---|---|
| **OH** | Corps, Buffalo District | Lake Metroparks | # | # | # | # | # |
| **OH** | Corps, Buffalo District | Portage Land Association Conservation Education | # | # | # | # | # |
| **OH** | Corps, Buffalo District | Cleveland Metroparks | # | # | # | # | # |
| **OH** | Corps, Buffalo District | The Nature Conservancy, Ohio Chapter | # | # | # | # | # |
| **OH** | Corps, Buffalo District | Geauga Park District | # | # | # | # | # |
| **OH** | Corps, Buffalo District | Willoughby Natural Areas Conservancy | # | # | # | # | # |
| **OH** | Corps, Buffalo District | Tinkers Creek Land Conservancy, Inc. | # | # | # | # | # |
| **OH** | Corps, Buffalo District | Wood County Park District | # | # | # | # | # |
| **OH** | Corps, Buffalo District | Metro Parks, Serving Summit County | # | # | # | # | # |
| **OH** | Corps, Buffalo District | Park District Foundation of Allen County | # | # | # | # | # |
| **OH** | Corps, Buffalo District | Portage County Park District | # | # | # | # | # |
| **OH** | Corps, Buffalo District | Metropolitan Park District of the Toledo Area | # | # | # | # | # |

| State | Administrator | Sponsor | Permitted Acreage | Replaced Acreage | Permitted Feet | Feet Replaced | Funding |
|---|---|---|---|---|---|---|---|
| **OH** | Corps, Buffalo District | Chagrin River Land Conservancy | # | # | # | # | # |
| **OH** | Corps, Buffalo District | Department of Natural Resources | # | # | # | # | # |
| **OH** | Corps, Buffalo District | Natural Areas Stewardship, Inc. | # | # | # | # | # |
| **OH** | Corps, Buffalo District | Hancock Park District | # | # | # | # | # |
| **OH** | Corps, Buffalo District | The Audubon Society of Greater Cleveland | # | # | # | # | # |
| **OH** | Corps, Buffalo District | Hudson Land Conservancy, Inc. | # | # | # | # | # |
| **OH** | Corps, Buffalo District | Johnny Appleseed Metropolitan Park District | # | # | # | # | # |
| **OH** | Corps, Buffalo District | Medina County Park District | # | # | # | # | # |
| **OH** | Corps, Buffalo District | Grand River Partners, Inc. | # | # | # | # | # |
| **OH** | Corps, Buffalo District | West Creek Preservation Committee | # | # | # | # | # |
| **OH** | Corps, Buffalo District | Cleveland Museum of Natural History | # | # | # | # | # |
| **OH** | Corps, Huntington District | Ohio Wetlands Corporation | | 14.5 | | | & |

| State | Administrator | Sponsor | Permitted Acreage | Replaced Acreage | Permitted Feet | Feet Replaced | Funding |
|---|---|---|---|---|---|---|---|
| **OH** | Corps, Huntington District | Cleveland Museum of Natural History | | 50 | 0 | 0 | & |
| **OR** | State Agency | Oregon Division of State Lands | 64 | 149 | 9,817 | 100 | $2,308,059 |
| **PA** | State Agency | National Fish and Wildlife Foundation | 64 | 75 | 0 | 0 | $697,450 |
| **SC** | State Agency | National Audubon Society | 0 | 0 | 0 | 0 | $0 |
| **SC** | State Agency | Historic Ricefields Association | 0 | 0 | 0 | 0 | $0 |
| **TX** | Corps, Fort Worth District | The Nature Conservancy | | 60 | | 0 | $1,400,000 |
| **TX** | Corps, Galveston District | Katy Prairie Conservancy | | 9 | | | |
| **TX** | Corps, Galveston District | National Fish and Wildlife Foundation | | | | | |
| **TX** | Corps, Galveston District | Texas Parks and Wildlife | | | | 61 | |
| **VA** | Corps, Norfolk District | The Nature Conservancy | 85 | 1315 | 0 | 0 | $4,870,000 |
| **WA** | Local Agency | Clallam County | 0 | 7 | 5,000 – 7,000 | 0 | |

# APPENDIX I: STATE MITIGATION REPLACEMENT RATIOS OR CREDIT DEFINITIONS

Below lists states that have established mitigation replacement ratios or credit definitions in mitigation banking statutes, regulations, or guidance. States often utilize interchangeable definitions for replacement ratios and credits ratios, thus the two methods are not distinguished. Replacement ratios are usually expressed in acres to be mitigated per acres impacted. Credit ratios are often expressed as number of acres per credit. Information is current through December 2001.

| State | Authority (Statute/Regulation/Guideline) | Mitigation Replacement Ratios or Credit Definition Ratios |
|---|---|---|
| Arkansas | Arkansas Soil and Water Conservation Commission. *Arkansas Wetlands Mitigation Bank Program*. <www.state.ar.us/aswcc/page19.html> | - Higher credit ratios required for impacts outside of geographic service area of bank. |
| Florida | Fla. Admin. Code Ann. R. 62-342.600. | - Higher ratios required for impacts outside regional watershed. |
| Georgia | USACE, Savannah District; USEPA, Region IV; USFWS, Southeast Region; and Georgia Department of Natural Resources. *Guidelines on the Establishment & Operation of Wetland Mitigation Banks in Georgia.* 1995. <www.sas.usace.army.mil/bankguid.htm#policy> | - Higher credit ratios required if impacts are in adjacent ecoregion.<br>- Lower credit ratios required if credit is withdrawn from a bank in a high growth county versus one in a rural county. |

| | | |
|---|---|---|
| Illinois | Ill. Admin. Code tit. 17, §1090.50. | - For minimal impacts, replacement ratio is 1.5:1; and 2:1 if out of basin.<br>- For significant impacts, replacement ratio is 2:1; and 3:1 if out of basin.<br>- For destruction, replacement ratio is 4:1; and 5.5:1 if out of basin.<br>- Replacement ratio is 5.5:1 if the impact site has endangered or threatened species; provides essential habitat for endangered or threatened species; is an Illinois Natural Area Inventory Site; is a wetland plant community that has floristic quality native index score of 20 or more and/or native mean coefficient of conservation of at least 4. |
| Indiana | MBRT. *Interagency Coordination Agreement on Wetland Mitigation Banking within the State of Indiana.* <www.lrl.usace.army.mil/orf/info/ICA1097.htm> | - Higher credit ratio required for use of pre-certified credits, which are credits sold before the bank is constructed.<br>- Minimum mitigation replacement ratio of 1:1; and minimum of 2:1 if outside watershed or service area of bank.<br>- Higher replacement ratios for enhancement and preservation; ratios may be as low as 10 to 25 percent of the credit value of created or restored wetlands. |
| Maine | 310 Code Me. R. §5. | - Replacement ratio is 1:1 for restoration, creation, or enhancement to compensate for impacts to wetlands not of special significance.<br>- Replacement ratio is 2:1 for restoration, creation, or enhancement to impacts in wetlands of special significance.<br>- Replacement ratio is 8:1 for preservation and uplands. |
| Maryland | Md. Regs. Code tit. 26, §§23.04.03;<br>David Walbeck and Denise Clearwater. *Maryland Nontidal Wetland Mitigation Guidance.* Nontidal Wetlands and Waterways Division. July 1998. <www.mde.state.md.us/wetlands/mitguide.htm> | According to statute, replacement ratios for the loss of nontidal wetlands are:<br>- 1.5:1 for emergent nontidal;<br>- 3:1 for scrub-shrub, forested nontidal, and nontidal wetlands of special state concern;<br>- 4.5:1 for shrub-scrub and forested wetlands of special state concern.<br>Replacement ratios for the loss of farmed nontidal wetlands are:<br>- 1.5:1 for enhancement of farmed nontidal wetlands;<br>- 1.5:1 for creation or restoration of emergent, scrub-shrub, or forested wetlands.<br>According to guidance, preservation receives 1/10 as much credit as restoration or creation. |

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| Michigan | Mich. Admin. Code r. 12 §281.954. | - Replacement ratio is 5:1 for restoration or creation if impact is on rare or imperiled wetlands.<br>- Replacement ratio is 2:1 for forested wetland types, some coastal wetlands, and wetlands that border on inland lakes.<br>- Replacement ratio is 1.5:1 for all other wetlands.<br>- Replacement ratio is 10:1 for preservation. |
| Minnesota | Minnesota Board of Water & Soil Resources. *Guidelines for Wetland Banking Minnesota Wetland Conservation Act.* March 16, 1994. | - Depending on county and land use, replacement ratio is 1:1 or 2:1, and higher if not in-kind.<br>- Deposits over 10 acres will receive 90 percent of credits as compared to deposits under 10 acres. |
| Missouri | MO Department of Natural Resources, MO Department of Conservation, USFWS, USEPA, USACE, NRCS, and Missouri Department of Transportation. *State of Missouri Aquatic Resources Mitigation Guidelines.* May 1998. | - Preservation receives partial credit as compared to other mitigation types.<br>Replacement ratios are:<br>- 1:1 for open water.<br>- 1.0-1.5:1 for farmed wetlands.<br>- 1-3:1 for emergent.<br>- 1.5-3:1 for shrub-scrub.<br>- case-by-case basis for streams.<br>Replacement ratios may be increased if mitigation is not conducted before or concurrent with impacts; is out-of-watershed; or the project impacts functioning mitigation sites. |
| New Jersey | N.J. Admin. Code tit. 7, §§7A-15.8, 7A-14.1. | - Replacement ratio for restoration is 2:1.<br>- Replacement ratio for creation is 2:1, unless applicant demonstrates equal ecological value and then it may be less.<br>- Enhancement is based on documented assessment of the loss of ecological value of the wetlands disturbed or modified. |

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| Ohio | Ohio Admin. Code §§3745-1-54(E)(4)(c), (E)(5), and (F). | - Replacement ratio is 1:1 for restoration or creation, replacing impacted wetland with equivalent or higher quality wetland.<br>- For enhancement and preservation, wetlands restoration or creation must be a mitigation component. Replacement is 2 acres of wetland enhancement or preservation for every *remaining* acre of compensatory mitigation requirement.<br>- Replacement ratios also tailored by wetland category as follows:<br>- 1.5:1 for category 1 non-forested or forested wetlands.[1]<br>- 2:1 for category 2 non-forested wetlands and 2.5:1 for forested wetlands.[2]<br>- 2.5:1 for category 3 non-forested wetlands and 3:1 for forested wetlands.[3] |
| Oregon | Or. Admin. R. 141-085-0135. | Replacement ratios are:<br>- 1:1 for restoration.<br>- 1.5:1 for creation.<br>- 3:1 for enhancement.<br>Ratios may increase when mitigation is out-of-watershed or for other relevant circumstances. |

[1] Wetlands assigned to category 1 support minimal wildlife habitat, and minimal hydrological and recreational functions as determined by an appropriate wetland evaluation methodology. Category 1 wetlands do not provide critical habitat for threatened or endangered species or contain rare, threatened, or endangered species. Category 1 wetlands may be typified by some or all of the following characteristics: hydrologic isolation, low species diversity, a predominance of non-native species (greater than 50 percent areal cover for vegetative species), no significant habitat or wildlife use, and limited potential to achieve beneficial wetland functions. Category 1 wetlands may include, but not limited to, wetlands that are acidic ponds created or excavated on mined lands without connection to other surface waters throughout the year and that have little or no vegetation and wetland that are hydrologically isolated and comprised of vegetation that is dominated (greater than 80 percent areal cover) by species including, but not limited to, *Lythrum salicaria*, *Phalaris arundinacea*, and *Phragmites australis*.

[2] Wetlands assigned to category 2 wetlands support moderate wildlife habitat, or hydrological or recreational functions as determined by appropriate wetland evaluation methodology. Category 2 wetlands may include, but not limited to: wetlands dominated by native species but generally without the presence of, or habitat for, rare, threatened or endangered species; and wetlands which are degraded but have a reasonable potential for reestablishing lost wetland functions.

[3] Wetlands assigned to category 3 support superior habitat, or hydrological or recreational functions as determined by an appropriate wetland evaluation methodology. Category 3 wetlands ma be typified by some or all of the following characteristics: high levels of diversity, a high proportion of native species, or high functional values. Category 3 wetlands may include, but not limited to: wetlands that contain or provide habitat for threatened or endangered species; high quality forested wetlands, including old growth forested wetlands, and mature forested riparian wetlands; vernal pools; and wetlands that are scarce regionally and/or statewide, including but not limited to, bogs and fens.

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| South Carolina | USACE, Charleston District; USEPA, Region IV; USFWS, Charleston Ecological Services Office; SC Department of Natural Resources; SC Department of Health and Environmental Control; and the USDA, NRCS. *Joint State/Federal Administrative Procedures for the Establishment and Operation of Wetland Mitigation Banks in South Carolina.* July 1996. <www.sac.usace.army.mil/permits/mitigate.html> | Lower credit ratio if not in same watershed. |
| Texas | 31 Tex. Admin. Code §16.3(c)(1)(F). | Impaired functions and values of the affected critical area shall be replaced on a 1:1 ratio, which may require restoration or replacement of the physical area affected on a ratio higher than 1:1. |
| Washington | WA Department of Ecology, WA Department of Fish and Wildlife, USACE, USEPA, and USFWS. *Guidelines for Developing Freshwater Wetlands Mitigation Plans and Proposals.* Mar.1994. | - Replacement ratio usually higher than 1:1 to ensure full replacement of wetland area and functions.<br>- Ratios are negotiable and based on functions being replaced and risks involved with proposed mitigation. |
| Wisconsin | Wis. Admin. Code §350.06. | - Replacement ratio is 1.5:1.<br>- Ratio of 1:1 may apply if the applicant demonstrates that credits will be purchased from a bank listed on the state registry of approved banks, and the project will not impact deep marsh, ridge and swale complex, wet prairie not dominated by reed canary grass, ephemeral pond in a wooded setting, sedge meadow or fresh wet meadow not dominated by reed canary grass, certain bog, certain hardwood swamp, certain conifer swamp, and certain cedar swamp. |
| Wyoming | WY Department of Environmental Quality. *Wyoming Statewide Wetland Mitigation Bank: Guidelines for Interpretation and Implementation.* Apr. 1995. | - Replacement ratio is 1:1 for creation or restoration.<br>- For enhancement, credit will be awarded for the percent increase in measurable values, but limited to a 50 percent increase. |


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