

# **Wetland Mitigation Banking Guidebook for Oregon**

**First Version, October 2000**

## **Acknowledgements**

In Oregon, wetland mitigation banking is a relatively new concept and the subject of increasing interest among federal, state, and local agencies. A Mitigation Banking Guidebook Committee was formed to develop this guidebook to provide information and guidance to entities considering mitigation banking. The guidebook is meant to be readable and useful to anyone interested in expanding their knowledge of wetland mitigation banking from the layperson to scientists and managers. It should be of particular value, however, to a potential bank sponsor. Also, it is hoped that this guidebook will be useful to wetland ecologists and other scientists working to establish, manage, or monitor state-of-the-art wetland mitigation banks.

The technical information in this guidebook does not necessarily reflect any single agency's policy or procedures. Rather, these concepts are a representation of the professional experience and technical expertise of the guidebook authors. Every banking proposal will be evaluated on a case-by-case basis for its potential merit to provide compensation for permitted wetland impacts.

The committee values input about ways to improve this guidebook and would appreciate any comments or recommendations from all guidebook users. All mistakes are our own, so please help us look good by pointing them out to us, but do not tell anyone else!

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## **Acronym List**

BMP	best management practice
CCAA	Candidate Conservation Agreement with Assurances
cfs	cubic feet per second
Corps	U.S. Army Corps of Engineers
DLCD	Oregon Department of Land Conservation and Development
DO	dissolved oxygen
DSL	Oregon Division of State Lands
ESA	Endangered Species Act
LCDC	Land Conservation and Development Commission
HCP	Habitat Conservation Plan
HEP	Habitat Evaluation Procedures
MBRT	Mitigation Bank Review Team
MOA	Memorandum of Agreement
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
OAR	Oregon Administrative Rules
ODA	Oregon Department of Agriculture
ODEQ	Oregon Department of Environmental Quality
ODFW	Oregon Department of Fish and Wildlife
OFWAM	Oregon Freshwater Wetland Assessment Method
ORNHP	Oregon Natural Heritage Program
ORS	Oregon Revised Statutes
OWRD	Oregon Water Resources Department
PAR	Property Analysis Record
PFC	properly functioning conditions
SHPO	State Historic Preservation Office
TAC	Technical Advisory Committee
USEPA	U.S. Environmental Protection Agency

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*WETLAND MITIGATION BANKING GUIDEBOOK FOR OREGON*

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USFWS      U.S. Fish and Wildlife Service  
WET        Wetland Evaluation Technique

# Wetland Mitigation Banking Guidebook for Oregon

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## **CHAPTER 1: PURPOSE AND SCOPE OF THE GUIDEBOOK**

### **1.1. OVERVIEW**

This guidebook is the outgrowth of many discussions concerning wetland mitigation banking by the Oregon Division of State Lands (DSL) Mitigation Banking Technical Advisory Committee (TAC). During the summer and early fall of 1996 an advisory committee developed the Oregon Administrative Rules (OAR 141-85-400 through 141-85-445) for wetland mitigation banking. Rule development considered the regulatory program of the U.S. Army Corps of Engineers (Corps) and the federal interagency guidelines for mitigation banks (*Federal Register*, November 28, 1995). The TAC is comprised of an interdisciplinary group of natural land management professionals.

During the development of the OARs for mitigation banking, the advisory committee decided that many of the issues raised could not, *and should not*, be addressed in the OAR because of the diversity of bank arrangements and the detailed and varied technical work needed to lead to successful mitigation banks in Oregon. Members of the advisory committee also believe that Oregon, as well as the nation overall, has not had enough experience to address all the aspects of such a relatively new concept. As a result, a Mitigation Banking Guidebook Committee, with various subcommittees designated to address specific elements of banking, was formed to produce this document. This guidebook attempts to provide comprehensive, updatable information on wetland mitigation banking. Its loose-leaf organization allows for the insertion of current data without reprinting or affecting those sections that do not need updating.

### **1.2. HOW TO USE THE GUIDEBOOK**

This mitigation banking guidebook is organized so that each chapter begins with a general overview of its concepts and then proceeds to explain the relevant concepts in a greater level of detail. This introductory chapter explains the overall purpose of mitigation banking. It also provides an initial understanding of the federal and Oregon regulations applicable to mitigation banking, and the use of mitigation bank credits.

Chapter 2, *Understanding Mitigation Banking*, will help you decide when a mitigation bank would be an appropriate tool for your purposes and provides an *overview* of what is actually involved in establishing a mitigation bank in Oregon.

Chapter 3, *Approval Process and Documentation*, provides a step-by-step discussion of the process to establish a mitigation bank in Oregon, and describes the documentation necessary to establish a bank.

Chapter 4, *The Practice of Mitigation Banking*, describes in more detail the regulatory considerations involved in banking. It discusses bank goals, service area, credit ratios and certification, advance sales, financial assurance, and protection assurance.

Chapter 5, *Environmental Considerations*, discusses some of the important siting considerations for establishing a mitigation bank, such as compliance with the Endangered Species Act (ESA), water quality and quantity, hydrology, wetland and upland buffers, cultural resources, land use, and success criteria.

Chapter 6, *Financial Considerations*, describes in more detail the financing arrangements needed so that the mitigation bank will be completed and maintained as approved. Concepts discussed include contingency plans, risk assessment, perpetual management costs, credit sales projections, market share, pricing of credits, cash flow, and estimating bank development and long-term financial assurances. An example project is used to illustrate the concepts discussed in this chapter.

Chapter 7, *Technical Methods*, provides some general principles that will likely be required for implementing a wetland mitigation bank. It discusses wetland site characterization, assessment, and monitoring, as well as providing additional information on hydrology and water quality.

The guidebook also provides a glossary of pertinent terms; an index so that you can find what you need quickly; real life examples of mitigation banks in Oregon (Appendix A); a bibliography of additional information on mitigation banking from a wide variety of sources (Appendix B); a list of federal and state agencies you may wish to contact for more detailed information (Appendix C); the Oregon regulations for mitigation banking (Appendix D); the federal interagency guidelines for mitigation banks (Appendix E); and the *Standard Mitigation Bank MOA* (Memorandum of Agreement) used in Oregon (Appendix F).

### **1.3. PURPOSE OF MITIGATION BANKING**

Wetland mitigation banking is a relatively new natural resource management concept. Its purpose is to replace the physical and biological functions and human-use values of wetlands due to unavoidable losses from anticipated development. Banking is most suitable for the compensation of development activities in which individual losses may be minor, but cumulative losses over time are substantial. Because of their small size and location within established areas of development, it may not be desirable to mitigate with traditional on-site, in-kind mitigation.

Wetland mitigation banking is most often achieved through the creation, restoration, enhancement, or, in rare instances, the preservation of other wetland areas of equivalent value generally located outside the immediate area of wetland/riparian loss or alteration. Banks are normally relatively large blocks of wetlands whose estimated tangible and intangible values, termed credits, are similar to cash deposits in a checking account. As anticipated development

is permitted, credits equivalent to the estimated unavoidable losses can be withdrawn or debited from the established mitigation bank. As debits continue over time, the bank credits are eventually exhausted.

### ***1.3.1. Better Conservation***

A mitigation bank makes it possible to compensate for small wetland losses that may go unmitigated because of their insignificant size coupled with the frequent inability to mitigate on-site. By consolidating mitigation for many small losses in one site, a bank can be more environmentally beneficial than traditional piecemeal on-site compensatory mitigation and more easily protected. It offers another option for resource managers and local governments. It can be more efficiently monitored and evaluated than many smaller sites, and *the resources are to be protected in perpetuity*. Because a bank is established in advance, it provides the opportunity for a more thorough, ecologically sensitive plan. This subsequently also allows mitigation efforts to be better integrated into state, regional, and local wetland planning efforts.

### ***1.3.2. Streamlined Authorization/Interagency and Sponsor Relations***

Because the mitigation element is taken care of in advance, a mitigation bank may make for faster permit processing and decision-making and provide economies of time and money for both permit applicants and the regulatory agencies. While initial bank establishment requires more effort than approval of single-project mitigation plans, once in operation a bank should minimize the conflicts between regulatory agencies and permit applicants. A bank can bring an increased level of predictability to the regulatory process and in many cases, remove much of the financial risk associated with permitted activities. Also, it is normally less costly to establish and manage one large wetland unit than many small compensatory wetland areas, on a per unit basis.

## **1.4. REGULATORY OVERVIEW**

Wetland mitigation banking in Oregon operates in the context of state and federal laws, regulations and policies, which require the issuance of permits for the filling and alteration of wetlands, and which require the replacement of lost wetland functions.

### ***1.4.1. Federal Regulatory Requirements***

Section 404 of the Clean Water Act provides that the Corps will regulate the discharge of dredged or fill material into waters of the United States, including wetlands. The Section 404 regulations define wetlands as:

*“Those areas that are inundated or saturated by surface and groundwater 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.”*

The Section 404(b)(1) guidelines, developed by the U.S. Environmental Protection Agency (USEPA), are the substantive criteria that the Corps uses to evaluate the effects of proposed discharges. The guidelines require that practicable alternatives to the proposed action be considered before a Corps permit is issued. The guidelines also require that if there is no practicable alternative available, the permit applicant will minimize any potential harm to the aquatic ecosystem. The Corps evaluates permit applications to ensure that impacts are avoided where practicable through the evaluation of alternative sites so that impacts are minimized, and that unavoidable impacts are mitigated through appropriate and practicable compensation, called compensatory wetland mitigation.

Mitigation policy was further clarified in a MOA between the Corps and the USEPA in 1990. The sequencing requirement articulated in the MOA provides that permit applicants must demonstrate that they have made every reasonable effort to avoid and minimize wetland losses through careful location and design before compensatory mitigation techniques such as wetland restoration, creation or enhancement can even be considered. *The MOA states a clear preference for on-site, in-kind replacement of wetland functions and values, and establishes a minimum one-to-one ratio as a rule of thumb for replacement.*

#### **1.4.2. Oregon Regulatory Requirements**

The DSL is authorized by Oregon’s Removal-Fill Law [Oregon Revised Statutes (ORS) 196.800 - 196.990] to issue permits for the filling or removal of material from waters of the state. The permitting program that has developed based on this statute is similar in most respects to the regulatory program administered by the Corps under Section 404. The processing and evaluation of permit applications by DSL follows a process similar to the Corps process and applies standards for evaluation similar to those of the Corps, including the requirements for an alternatives analysis, minimization of impacts, and compensation for unavoidable impacts. The DSL rules require that *compensatory mitigation must provide replacement of affected wetland functions and values with equal or greater functions and values.* The rules express a *preference for on-site and in-kind mitigation*, and provide details for mitigation ratios, requirements for mitigation plans, monitoring, financial assurances, and enforcement of permit conditions.

### *1.4.3. Use of Mitigation Bank Credits*

Mitigation banking provides a means to satisfy the requirement for compensatory mitigation for individual projects as required by Oregon and Corps regulations. However, both programs emphasize that compensatory mitigation will only be considered after it has been shown that there are no practicable alternatives to the proposed action, and that impacts at the project site have been minimized. *The existence of a mitigation bank, and the credits that it generates, does not alter this sequencing requirement, nor does it alter the preference of both programs for on-site, in-kind mitigation.* The decision as to whether or not credits from a mitigation bank may be used as mitigation for a particular permit application, as well as the number of credits that would be required, is made by the Corps project manager and DSL resource coordinator evaluating the project.

## **CHAPTER 2: UNDERSTANDING MITIGATION BANKING**

### **2.1. OVERVIEW**

This chapter is intended to help people understand the distinctions between traditional wetland mitigation and wetland mitigation banking. It also provides an overview of the approval process and documentation required for the establishment of a wetland mitigation bank in Oregon.

### **2.2. WHAT IS MITIGATION?**

Mitigating the environmental impacts of necessary development actions on wetlands is a central premise of federal and state wetland programs. The preference of regulators has been to emphasize on-site, in-kind mitigation. Federal wetland regulation has been guided primarily by the USEPA and Corps under Section 404 and relies on the use of compensatory mitigation to offset unavoidable damage to wetlands, for example, by the restoration or creation of wetlands.

Oregon and the Federal Government define mitigation as the reduction of adverse effects of a proposed project by considering, in the following order:

- a. Avoiding the impact altogether by not taking a certain action or parts of an action.
- b. Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- c. Rectifying the impact by repairing, rehabilitating or restoring the affected environment.
- d. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action by monitoring and taking appropriate corrective measures.
- e. Compensating for the impact by replacing or providing comparable substitute wetland or water resources.

Compensatory mitigation actions typically include creating a wetland where one did not exist before, restoring a former wetland, enhancing an existing but degraded wetland, or in exceptional cases, preserving an existing healthy wetland.

### **2.3. WHAT IS A MITIGATION BANK?**

Mitigation banking can be defined as wetland restoration, creation, enhancement, and in exceptional circumstances, preservation undertaken expressly for compensating unavoidable wetland losses due to anticipated development actions. Mitigation banks are used when wetland compensation is not feasible and/or desirable near the development site. Some mitigation banks are actually networks of bank sites distributed throughout a watershed or

planning area. Mitigation banks typically result in the consolidation of what would otherwise be small, fragmented wetland mitigation projects into one or more larger contiguous area(s).

Restored, created, enhanced, and preserved wetlands generate “credits” which may subsequently be withdrawn to offset “debits” incurred at a number of project development sites. Ideally, mitigation banks are constructed and functioning in advance of development impacts, and are seen as a way of reducing ecological uncertainty by demonstrating achievement of successful performance standards in advance of credit withdrawals. Banks also provide economies of scale relating to the planning, implementation, monitoring, and management of mitigation projects.

#### **2.4. WHEN AND WHEN NOT TO BANK**

The first key difference between a wetland mitigation bank (or wetland mitigation in general) as opposed to other wetland programs is that *wetland mitigation banks are always intimately tied to Oregon’s Removal-Fill law and the federal Clean Water Act*. There must be applicants for permits to fill, excavate, or otherwise alter wetlands in the vicinity in order for wetland mitigation or mitigation banks to be warranted. For example, in the last ten years in Malheur County (Oregon’s largest and most undeveloped county), there have been five removal-fill permits issued, all for wetland impacts under 0.5 acre. A bank would not likely be financially successful here. This is not to say that wetlands are not important features of the landscape in an area without development-related activities. However, if wetland losses are not expected to be permitted through the regulatory process, the appropriate tool for wetland improvement is not wetland mitigation banking.

The correct tool could be one of the many other non-regulatory programs that encourage wetland stewardship or that provide direct payments for leaving productive wetlands “as is” on private property. An important reference for these stewardship options is the 1995 *Oregon Wetlands Conservation Guide* by the Oregon Wetlands Conservation Alliance, which guides property owners to find a suitable option for their particular situation, describes available options, and provides the names and phone numbers of organizations to contact in association with each option.

Another difference exists between wetland mitigation banks and typical wetland mitigation projects. *A wetland mitigation bank is generally a larger effort to generate wetland improvements in advance of the expected losses of wetlands and wetland functions from anticipated development*. The bank sponsor often is not a permit applicant, and usually does the wetland improvements before any wetland losses.

A typical wetland mitigation project, on the other hand, is usually much smaller than a typical wetland mitigation bank. It is usually only required to compensate for a single (or a few smaller)



wetland loss. The permit applicant, as a requirement of a permit, performs traditional wetland mitigation.

If, as a potential bank sponsor, you are looking for a site to establish a wetland mitigation bank, the following factors must be carefully and fully considered. What is your motivation for pursuing the approvals necessary to build and operate the bank? Are you representing a transportation department that needs an effective means of dealing with wetland issues? In this case, you may be proposing a “single-user” bank. Such an arrangement may restore, create, enhance or preserve wetlands in advance of the unavoidable impacts resulting exclusively from your department’s planned road improvements.

Are you a residential developer who knows that wetlands are common on your proposed development sites as well as throughout your region? You may wish to establish a mitigation bank that can be used to mitigate for your projects’ impacts as well as permitted impacts to other wetlands in the region. As the bank sponsor, you can sell wetland “credits” to permit applicants who would otherwise need to do their own wetland mitigation. And in the true entrepreneurial approach, you may have sufficient cause by “doing your homework” that you could create a wetland mitigation bank and sell the credits for sufficient sums that allow you to realize a profit. Other motivation may come from the environmental community’s desire to take advantage of the capabilities of a bank to accomplish more successful mitigation than the usual project-by-project approach.

No matter who you are or what your motivation is, planning, designing, building, operating, and maintaining a mitigation bank is going to *take time and cost money up-front*, often long before you see a return on your investment. Gathering the data to satisfy the different agencies and groups on the Mitigation Bank Review Team (MBRT) will take time and resources. The MBRT will advise the Corps and DSL in working with the sponsor to develop the Mitigation Bank Instrument (a formal document that stipulates the terms and conditions of the bank). Agencies to be represented on the MBRT include the USEPA, U.S. Fish and Wildlife Service (USFWS), Oregon Department of Environmental Quality (ODEQ), Oregon Department of Fish and Wildlife (ODFW), Oregon Department of Land Conservation and Development (DLCDD), the city or county planning office, and the local Soil and Water Conservation District. Developing the Mitigation Bank Instrument will likely require many meetings with the MBRT, and there are no ironclad guarantees of success. As a potential sponsor, can you finance this up-front cost as venture capital? Can you afford to finance bank construction as you would any large construction project with inherent risks?

To minimize risks, one strategy is to phase your bank construction within the context of a larger overall plan so that you are doing smaller portions of wetland construction while waiting to see if demand for wetland credits is sufficient to allow you to proceed with later phases. This allows you to build trust with the regulatory agencies and to test the demand for credits in your service

area while you avoid huge financial outlays. It also allows you to adjust your outlays if other banks are competing for your potential customers in the same service area.

If you do not have a means to cover these initial costs and cannot be reasonably sure of a strong return, you may not choose to get involved in wetland mitigation banking. As with many other business ventures, can you live (or sleep at night) with the high risk? Do you understand that wetland mitigation banking, like other business ventures, requires the ability to work for long-term goals in the face of short-term hurdles? Are you willing to protect the bank in perpetuity? On the other hand, the practice of banking can lead to very successful economic and environmental results. For example, the City of Eugene, Oregon, has established a bank that is invested in restoring wet prairie (a heavily altered, formerly common type of wetland) while allowing development of needed business areas on the city's west side.

Another example is the Florida WetlandsBank<sup>tm</sup> which is run by a consortium of consultants who are making a reasonable profit by restoring and enhancing a section of the eastern Everglades through the sale of wetland credits. The City of Pembroke Pines owns the property that will become a permanent wetland park at no cost to the city. Also, the consultants avoided the considerable costs of land acquisition. The bank contributes to the land costs and future maintenance fund with each credit sold. Other examples of creative wetland mitigation banking ventures are available. Oregon case studies are described in Appendix A of this guidebook, and several references for further information are listed in Appendix B, *Bibliography*.

*Wetland mitigation banks are likely to be most effective when they address the particular wetland losses anticipated to occur in the watershed in the face of obvious development pressure.* For example, are there indications from local planning agencies that a given part of a city, say, along a major river, is likely to grow as can be seen by the number of building permits issued or by the location of the urban growth boundary in comparison to remaining buildable land? You would probably attempt to site your bank along the same river, just outside the urban growth boundary, so that it is positioned to provide "in-kind" mitigation for these anticipated wetland impacts. Of course, many other environmental, economic, and social factors will have a bearing on where it is desirable and possible to locate wetland mitigation banks.

## **2.5. SUMMARY OF REQUIREMENTS TO DEVELOP A BANK**

The requirements to develop a mitigation bank in Oregon are found in OAR 141-85-400 through 141-85-445 and in the federal interagency guidelines (Appendices D and E, respectively). The elements summarized below describe the process that must be followed by the bank sponsor, DSL, Corps, and the MBRT to develop a bank Prospectus (a preliminary document describing a proposed bank to enable agency review) and the Mitigation Bank Instrument, as well as all the items that must be documented and addressed in particular in order

to construct and operate the bank. More detailed information on these topics can be found in Chapter 3, *Approval Process and Documentation* and Chapter 4, *The Practice of Mitigation Banking*.

- The potential bank sponsor must meet with the DSL and the Corps – the “Pre-prospectus” meeting.
- The potential bank sponsor must prepare a Prospectus that outlines the goals, the need, and the plan for the bank.
- The Prospectus is submitted to the Corps and DSL.
- The agencies review the Prospectus and respond to the bank sponsor within 30 days regarding sufficiency.
- If sufficient, public notice of the *Intent to Create a Mitigation Bank* is issued.
- The DSL and Corps assemble a MBRT within 30 days from the public notice, or as soon as possible.
- The DSL, Corps, and MBRT work with the bank sponsor to develop a Mitigation Bank Instrument. There is no time limit proposed because of the great differences anticipated between different banks in terms of how difficult or easy it may be to gather, refine, interpret, and present that information.
- The DSL and the Corps sign the mitigation bank MOA indicating approval, and circulate it to the MBRT members for signature.
- Upon completion, a *Notice of Mitigation Bank Instrument Approval* is issued.
- If no appeals are received, after 30-day period the bank sponsor can begin construction and operation of the bank following the plan in the Bank Instrument.
- The bank sponsor monitors the bank site(s) and submits annual ecological and credit accounting reports.
- The MBRT reviews annual bank performance and may meet to discuss bank issues, as necessary.

## **CHAPTER 3: APPROVAL PROCESS AND DOCUMENTATION**

### **3.1 OVERVIEW**

This chapter provides detailed information on the approval process and documentation required to establish a mitigation bank in Oregon. It provides a step-by-step discussion of the process and associated documents, and an outline for the Mitigation Bank Instrument and the MOA.

### **3.2. PROCESS TO ESTABLISH A MITIGATION BANK IN OREGON**

#### ***3.2.1. Pre-prospectus Meeting***

To initiate the process for establishing a mitigation bank, the sponsor will develop a Prospectus for submittal to the Corps and DSL. Prior to this submission, the sponsor is encouraged to contact the Corps and DSL to arrange for a pre-prospectus meeting to help the sponsor understand the requirements of a bank and to obtain the agencies preliminary views on the potential feasibility and acceptability of the proposal.

#### ***3.2.2. Prospectus***

The Prospectus is a preliminary document describing a proposed bank in sufficient detail to enable review by the Corps and DSL to determine whether the proposed bank would be technically feasible, whether there is sufficient need for mitigation credits in the service area proposed by the sponsor, and whether the bank can meet the policies stated in federal guidelines and DSL rules. The Prospectus should describe the proposed mitigation plan at least in concept; if the plan has been developed in more detail, it should be included. In fact, the more information which can be included in the Prospectus describing the mitigation plan and the administrative workings of the bank, the more useful the Prospectus will be as a basis for developing the Mitigation Bank Instrument.

#### ***3.2.3. First Public Notice***

Once a Prospectus has been received, reviewed, determined to be complete, the proposal appears to be technically feasible, and there has been a demonstration of need for mitigation credits, a public notice will be issued jointly by DSL and the Corps seeking comments on the proposed mitigation bank. To facilitate publication of this notice, the sponsor should provide a map in the Prospectus showing the general location of the mitigation bank site, a drawing of the proposed mitigation work at the site, and a map of the proposed service area.

#### **3.2.4. Mitigation Bank Review Team**

At the time the public notice is issued, federal, state and local agencies will be requested to provide representatives to serve on the MBRT. As mentioned previously, the MBRT advises the Corps, DSL, and sponsor during development of the Mitigation Bank Instrument. Agencies represented on the MBRT include the USEPA, USFWS, ODEQ, ODFW, DLCD, the city or county planning office, and the local Soil and Water Conservation District. Other agencies, groups or individuals may be invited to participate based on the nature and location of the bank, their particular interests, and/or any specific expertise which may be required in development of the Mitigation Bank Instrument. Oregon rules for mitigation banking limit the size of the MBRT to ten members. The Corps and DSL jointly chair the MBRT.

The sponsor, Corps, DSL and MBRT members meet to review and refine the details of the Mitigation Bank Instrument. The sponsor should anticipate several meetings over a period of several months to resolve any issues that may be raised by the MBRT and to achieve consensus on the terms and conditions of the banking agreement. This process can take from six months to over a year.

Issues subject to discussion by the MBRT may include details of the proposed mitigation site plan, service area, number of credits to be generated by the bank, water quality, performance standards and monitoring plans, reference sites, contingency plans, and financial assurances, and protection in perpetuity. These are the typical issues discussed by the MBRT, but all aspects of planning, construction and operation of the bank are subject to review and comment.

The initial MBRT meeting should be combined with a visit to the proposed mitigation site. A copy of the Prospectus should be provided to the MBRT members in advance of this meeting. Issues raised at this first meeting will usually set the course for the MBRT review process, with subsequent meetings focused on resolution of these issues.

#### **3.2.5. Mitigation Bank Instrument**

The Mitigation Bank Instrument is the document that describes in detail the physical and legal characteristics of the bank, and how the bank will be established and operated. It is the basis for the agreement that establishes the mitigation bank. Its requirements, which are found in the federal guidelines and Oregon regulations, are listed below.

1. Purpose of the Bank. This section describes the sponsor's intent in creating the bank, including the wetland functions to be restored, enhanced or created by the bank, the need for this mitigation, and the service area within which credits will be available for sale.

- a. Goals of the Bank. The goals should be specific to the hydrologic and ecological functions to be provided by the bank; the goals will be used as the basis for the performance standards to be described in the Mitigation Bank Instrument.
  - b. Demonstration of Need. Show that there is a need for a mitigation bank at the proposed location by describing the level of permitting involving wetland alterations within the area proposed to be the service area for the bank, and state whether the current rate of permitting is expected to continue, increase or decline.
  
  - c. Service Area. Describe the proposed service area; provide justification based on watershed boundaries, topography, hydrology, ecological similarities, and other biological and physical factors as appropriate.
2. Site Description. This section describes the mitigation bank site in sufficient detail to provide a clear understanding of existing conditions at the site.
- a. Location. Describe the site's location with reference to nearby towns, roads, waterways, etc.; provide the location with reference to section, township and range.
  - b. Current and Past Uses. Describe the current and previous land uses. If the site has been used for agricultural production, list the crops that were grown and describe cultivation practices including drainage alteration.
  - c. Adjacent Land Uses. Describe the existing and potential future land uses on adjacent properties.
  - d. Assessment of Mitigation Site. Provide the existing wetland and ecological characteristics as a basis for describing the mitigation strategy in the Mitigation Bank Instrument.
    - (1). Wetland Delineation. Provide a delineation of wetlands existing on the site using the 1987 *Corps of Engineers Wetland Delineation Manual* (Appendix C).
    - (2). Hydrogeomorphic and Cowardin Classes. Identify the types of wetlands existing on the site using the Cowardin classification system (Cowardin 1979) and the Hydrogeomorphic Approach (Brinson 1993; see Chapter 7 for more information).
    - (3). Ecological Baseline. Describe the existing vegetation and wildlife uses.
  - e. Potential for Toxic Contamination due to Present or Past Uses On-site or on Adjacent Properties. Describe the potential for toxic contamination that may have occurred at the site.

f. Water Quality.

(1). Surface Water Quality. Describe the quality of surface waters and identify any known or potential sources of degradation that may affect those waters.

(2). Groundwater Quality. If groundwater is to be used as a source for wetland hydrology, identify any known or potential quality issues.

3. Mitigation Strategy. This section describes in detail the proposed mitigation work to be accomplished at the site.

a. Ecological Goals. State the hydrologic and ecological goals for the mitigation improvements as a basis for describing the work to be accomplished and for setting performance standards, all of which becomes the basis for the creation of banking credits.

b. Site Mitigation Plan. Describe in detail all the proposed modifications to create, restore or enhance wetlands; include details of hydrologic modifications, site grading, soil removal and/or stockpiling, planting, etc.

c. Effects of Adjacent Land Uses. Describe the effects to the proposed mitigation improvements of existing or potential land uses on adjacent or nearby properties, as well as any potential effects on adjacent properties due to changes in drainage patterns or other alterations at the site.

d. Reference Site. Identify the location and characteristics of the reference wetland site.

e. Credits Anticipated and Method Used to Determine Credits. Provide an analysis of the credits expected to be generated from the proposed mitigation improvements, stating the method used to determine those credits.

f. Estimated Project Cost and Timeline. Provide an outline of the major project elements and the costs associated with each element, the total project cost, including costs associated with maintaining and monitoring the site, and the schedule for accomplishing the work including periodic maintenance and monitoring.

4. Success Criteria. In this section describe the standards that will be used to determine whether the mitigation work meets the hydrologic and ecological goals stated above, how the development of the mitigation work will be measured, and how deficiencies will be corrected if they occur.

- a. Performance Standards. State the performance standards based on the hydrologic and ecological goals for the bank stated above; performance standards should be specific and measurable; the certification of credits, and therefore the availability of credits for sale, will be based on the achievement of the performance standards.
  - b. Monitoring Plan. Describe how the performance of the mitigation improvements will be monitored and specify monitoring frequencies, techniques and reporting schedules.
  - c. Management Plan. Describe who and how the project will be managed in perpetuity.
  - d. Contingency Plan. Describe the plans for correcting deficiencies in meeting the performance standards, including the parties responsible for the remediation work and the source of funds for this work, as well as the financial assurances in the form of a performance bond, escrow account, etc., which will be provided to the Corps and DSL to be used in the event that the sponsor does not perform.
5. Regulatory Requirements. This section provides evidence that certain requirements of the federal guidelines and the state rules for mitigation banking have been met.
- a. Proof of Ownership. Provide a copy of the deed or contract showing that the bank sponsor owns the land on which the mitigation improvements are to occur.
  - b. List of Adjacent Property Owners. Provide the names and mailing addresses of owners of property adjacent to or within 500 feet of any boundary of the mitigation site. This information is needed to provide notice to other property owners that a wetland mitigation bank is proposed.
  - c. Land Use Approvals. Provide documentation signed by an official of the local planning department with jurisdiction over the mitigation site stating that the establishment of a mitigation bank is an allowed use under the terms of the local comprehensive plan and zoning.
  - d. Proof of Financial Resources. Provide evidence demonstrating that the sponsor has the financial capability to perform the work to implement the proposed mitigation improvements and to maintain, monitor, and take needed corrective actions in perpetuity.
  - e. Long-term Site Protection Measures. Include a copy of the conservation easement or other document that establishes protection of the site in perpetuity and prohibits its use for any purpose other than the establishment, management and maintenance of wetlands and upland buffers.



### ***3.2.6. Memorandum of Agreement***

The MOA is the document that, once signed, constitutes the agreement among the parties, and establishes the bank. It is in a standardized format listing the main points of the agreement, with references to the Mitigation Bank Instrument for some of the specific details. A copy of the standard MOA used in Oregon is provided in Appendix F.

Although not a requirement of federal guidelines or Oregon rules, use of the MOA is advantageous in that it is succinct, clear, and expressed in the form of an agreement, whereas the Bank Instrument typically resembles a planning document or report. The MOA, referencing the Bank Instrument for details, states:

- the purpose of the wetland mitigation bank,
- bank goals,
- mitigation bank site,
- service area,
- performance standards,
- monitoring and contingency plans,
- credits to be established and conditions for certification and accounting of credits,
- reports provided by the sponsor, including monitoring and credit status reports,
- effective date of the agreement and provisions for modification/termination, and
- obligations of the parties.

The MOA is prepared after agreement has been reached on the terms of the Mitigation Bank Instrument and is reviewed by the sponsor and the MBRT. The MOA becomes effective upon signature by the sponsor, the Corps and DSL. Agencies represented on the MBRT will be invited to sign the MOA to indicate their agreement with its terms.

### ***3.2.7. Second Public Notice***

When the Mitigation Bank Instrument and MOA have been approved, the Corps and DSL will jointly publish a public notice announcing the establishment of the wetland mitigation bank. The public notice will summarize the elements of the Mitigation Bank Instrument including the number of credits to be generated by the bank and will include a map showing the location of the bank and the limits of the service area.

## **CHAPTER 4: THE PRACTICE OF WETLAND MITIGATION BANKING**

### **4.1 OVERVIEW**

This chapter provides detailed information on the regulatory aspects involved in wetland mitigation banking. It discusses the need for bank goals, defines service area, credit ratios and certification, advance sales, financial assurance, and protection assurance.

### **4.2. REGULATORY CONSIDERATIONS**

#### ***4.2.1. Wetland Mitigation Bank Goals***

An important first step in planning a wetland mitigation bank is to clearly state its specific goals. As stated in the federal interagency guidelines, the overall goal of any mitigation bank is:

*“To provide economically efficient and flexible mitigation opportunities, while fully compensating for wetland and other aquatic resource losses in a manner that contributes to the long-term ecological functioning of the watershed within which the bank is to be located. The goal will include the need to replace essential aquatic functions which are anticipated to be lost through authorized activities within the bank’s service area.”*

Specific bank goals should be driven by the anticipated need for mitigation within the proposed service area, and should specify the type of wetland and the wetland functions that would be provided by the bank in perpetuity. The goals provide the basis for development of the mitigation plan for the bank site and for the performance standards that will be used to determine the success of the mitigation work and, ultimately, the availability of credits for sale. It is the responsibility of the bank sponsor to define the goals of the bank early in the process to provide direction to the Corps, DSL and the MBRT in the review and development of the Mitigation Bank Instrument.

#### ***4.2.2. Service Area***

The service area is defined by the regulatory agencies as *that area in which credits from a mitigation bank can be used to compensate for unavoidable wetland losses due to removal, fill or alteration activities*. The geographic limits of the service area should take into consideration the boundaries of the watershed in which the mitigation bank site is located, ecological unit boundaries, and distance from the bank site to the likely sources of credit demand. *Sponsors should realize that as the distance from the permitted fill site to the bank site increases, the desirability of using bank credits as mitigation decreases*. If there are no areas within 10 to 15 miles of the bank site where mitigation credits are likely to be

needed, the sponsor may consider that a mitigation bank at that location may not be economically feasible.

Determinations on use of bank credits as mitigation for individual permit actions will be made on a case-by-case basis by the Corps regulatory project managers and DSL resource coordinators evaluating the permit applications. *The establishment of a service area in a banking agreement does not guarantee to the sponsor that credits will be accepted as mitigation.* Infrequently, there may be cases in which bank credits may be accepted for projects outside the service area when it is determined that use of the bank credits would be environmentally preferable to other mitigation options, or where no other practicable mitigation options exist for the project. These determinations will be made on a case-by-case basis and may be subject to higher credit ratio requirements at the discretion of the agencies.

#### **4.2.3. In-kind Mitigation**

Compensatory mitigation that provides functions similar to those lost due to permitted filling is preferred by the regulatory and resource agencies. The Prospectus should describe the need for mitigation in the proposed service area and identify the types of wetlands that are likely to be lost due to authorized fills. The bank should then be designed to be responsive to anticipated needs within the service area. Use of mitigation bank credits when the wetland functions lost are not the same as those provided by the bank may be acceptable if it is determined to be environmentally preferable to in-kind mitigation. The Corps and DSL make out-of-kind mitigation decisions on a case-by-case basis during the permit evaluation process.

#### **4.2.4. Bank Operational Life**

The operational life of a bank refers to the period during which the terms and conditions of the Mitigation Bank Instrument are in effect. With the exception of arrangements for the long-term management and protection *in perpetuity* of the wetlands, the operational life of a bank terminates at the point when (1) compensatory mitigation credits have been exhausted or the banking activity is voluntarily terminated with written notice by the sponsor to the Corps, DSL, and MBRT, *and* (2) it is determined that the debited bank is functionally mature and/or self-sustaining to the degree specified in the Bank Instrument.

#### **4.2.5. Credit Ratios**

Credits may be established by using the ratios stipulated in state rules (OAR 141-85-135). The rules provide that *restoration* will be credited at a ratio of 1:1, *creation* at a ratio of 1.5:1, and *enhancement* at a ratio of 3:1. *Disturbed cropped wetlands* are credited at a ratio of 2:1. For restoration, this means that each acre of restored wetland will generate one mitigation credit. If credits are to be generated by creation or enhancement, 1.5 acres of created wetland

or 3.0 acres of wetland enhancement, respectively, will be required to generate one mitigation credit.

Any other wetland and habitat functional assessment and evaluation methodology approved by DSL and the Corps in consultation with the MBRT may be used instead of the acreage ratios. Credits will be determined by the difference between the baseline conditions of the mitigation site prior to restoration, enhancement or creation activities, and the increased wetland functions that result from those activities. The number of credits required to satisfy the mitigation needs of a permit action is decided by the Corps and DSL based on the area and type of wetlands to be filled. The credit ratios used to establish bank credits do not always determine the number of credits needed to satisfy permit requirements. For example, an applicant who is outside the bank service area may be required to buy more credits than someone inside the service area. To put it in economic terms, the bank sponsor operates on the supply side of the supply and demand equation. The permit applicant is on the demand side, with the level of demand determined by the permit decisions of the regulatory agencies.

#### **4.2.6. Credit Certification**

Credits become available for sale when the Corps and DSL certify them after consultation with the MBRT. *Certification is based on evidence provided by the sponsor that the mitigation site work has been completed, and that the performance requirements are being met as required by the terms of the Mitigation Bank Instrument.* Evidence to be provided by the sponsor may include as-built drawings, photographs and monitoring reports, as well as site inspection visits by members of the Corps, DSL, and MBRT. The Corps and DSL will provide notice of credit certification to the sponsor in writing. No credits may be sold by the bank sponsor prior to receipt of written certification, *except for credits authorized for sale in advance* as discussed in the next section.

#### **4.2.7. Advance Credit Sales**

The regulatory and resource agencies recognize the need for a bank to be financially stable in order to accomplish the long-term ecological goals of the mitigation plan. Because financial considerations are particularly critical in the early stages of bank development, the agencies will consider authorizing the sale of a limited percentage of credits in advance of certification in cases where the likelihood of success of the bank is high. However, before the advance sales will be authorized, the sponsor must accomplish the following actions for the long-term viability of the mitigation bank.

1. The Mitigation Bank Instrument has been approved and the MOA signed by the sponsor, the Corps, and the DSL.

2. Long-term protection of the bank site has been secured with ownership by a conservation agency or organization, a conservation easement to a third party, or in some cases, a deed restriction.
3. Appropriate financial assurances such as a performance bond, escrow account, or endowment have been established.
4. Initial site work is complete and approved, with review of the as-built drawings with an on-the-ground check by the MBRT.

The maximum advance credit sale allowed in Oregon regulations is 30 percent of the total credits projected for the bank at maturity. The Corps and DSL, in consultation with the MBRT, have the discretion to determine the percentage of credits to be made available for advance sale, if any. The decision will be based in part on the level of confidence that the agencies have in the willingness and ability of the sponsor to complete and maintain the mitigation work according to the banking agreement. Authorization of advance credit sales must be received in writing from the Corps and DSL before any credits are sold.

#### **4.2.8. Credit Sale Record Keeping**

The sponsor must maintain a journal of all credits authorized and sold. Each sale should be documented individually with a transaction record. Sponsors may use any method of record keeping which accurately tracks the availability and sales of bank credits. Copies of periodic reports of credit debiting, crediting and balances will be provided to the Corps, DSL and the MBRT as required by the terms of the MOA.

### **4.3. DELINEATION MAP**

For any proposed mitigation bank site that includes existing wetlands, the boundaries of the existing wetlands must be delineated and mapped. The delineation will be performed using the current version (1987) of the *Corps of Engineers Wetland Delineation Manual*. The manual is available online at <http://www.wes.army.mil/el/wetlands/wlpubs.html> (Appendix C). In some cases involving agricultural land, the Corps will accept a wetland delineation prepared by the Natural Resources Conservation Service using the procedures in the *National Food Security Act Manual*. In most cases, however, the delineation will be prepared using the *Corps Wetland Delineation Manual* and must be reviewed and approved by the Corps and DSL.

#### **4.4. FINANCIAL ASSURANCE**

Financial assurance is the level of guarantee sought by the regulatory agencies so that the bank will be completed and maintained as planned and approved. It is based on state and federal policies found in OAR 141-85-415(7) and the federal guidelines. *The regulatory agencies are primarily interested in knowing that the bank sponsor has evaluated the costs and can provide assurances that there is the financial capability to fund all required activities including contingencies in the event of failure.* Financial assurances may be in the form of escrow accounts, trust funds, surety bonds, proof of stable revenue sources, dedicated accounts, letters of credit, endowments or other similar instruments.

Accordingly, banks posing a greater risk of failure and where credits have been debited (the bank is actually tied to specific fill or removal permits) should have comparatively higher financial sureties in place, than those banks where the likelihood of success is more certain. Also, the bank sponsor is responsible for securing adequate funding to monitor and maintain the bank throughout its operational life, and for needed stewardship tasks in perpetuity. Total funding requirements should reflect realistic cost estimates for monitoring, long-term maintenance, contingency, and remedial actions.

Mitigation occurs when a functioning wetland system replaces another that is impacted in the development process. Any credits sold before the time when the bank can be shown to be a functional wetland are essentially “on loan” from the agencies to the bank developer. As in any loan transaction, collateral is necessary to protect the lender. More detailed information concerning the financial considerations of a mitigation bank can be found in Chapter 6, *Financial Considerations*.

##### **4.4.1. Bank Development**

Land. The commitment of land to the bank is the first step in providing financial assurance. A high level of assurance is provided by land held in fee title by the developer where there are no loans against the land. If there are loans, they should be subordinated to any protection documentation required on the land. If the developer does not own the land, some assurance can be given by establishing an escrow account holding the deed and the funding for purchase. The budget should consider land costs, closing costs, and interest on loans.

Construction/Restoration. The cost of construction or restoration of wetlands is a subject for financial assurance even if no credits can be sold at this stage. A financial assurance measure (bond or dedicated account; see Section 4.4.2 for more information) for all construction work may be required and is largely released upon the completion of construction. A detailed and comprehensive budget helps to establish credibility with the agencies. The agencies need to be assured that construction will be completed even if the project proponent

can no longer do so. Some of the activities to be represented could include design, hydrology analysis, soil analysis, grading, water control structures, erosion control devices, aggregate, water, access routes, fencing, trails, signs, GIS mapping, administration, and interest on loans.

Revegetation. Also, a financial assurance measure for revegetation costs may be required. Such a bond may be released as monitoring indicates the growth and coverage of the new vegetation. Some of the activities to be represented in revegetation budgets could include a planting design, planting stock, labor, exotic species control or eradication, soil amendments, irrigation equipment, and miscellaneous equipment.

Monitoring and Management. Monitoring and management begins with the completion of planting. However, some projects may want to propose a multi-year planting program in order to achieve a more natural succession of foliage and a greater chance of revegetation success. Monitoring and management requirements typically change as the project progresses from initial revegetation management activities to long-term management activities. Financial assurance measures may be required for initial period monitoring and management activities. These may be released as vegetation monitoring indicates the growth and coverage of the new vegetation, typically as milestones designated by achievement of specific performance or success criteria.

Detailed and comprehensive management plans and budgets for monitoring and management activities help to establish credibility with the agencies. Some of the activities to be represented could include monitoring as required by the agencies, management of water systems, management of irrigation systems, irrigation system maintenance, water costs, electricity costs, exotic species control, maintenance of infrastructure, agency reporting, and trash pick-up, etc.

Long-term activity budgets should be significantly reduced on an annual basis as the vegetation progresses and the wetland begins to function normally. Nevertheless, monitoring and management costs do continue at varying intervals. Budgets that demonstrate and justify such estimates using the annual average cost of management will help establish long-term financing mechanisms such as endowments.

#### **4.4.2. Assurance Mechanisms**

Regardless of the method of financial assurance, the regulatory agencies must evaluate both the cost of the project and the risk of damage or failure in order to estimate the amount of money necessary to ensure completion. This is called the amount of the completion risk. Second, the regulatory agencies must make absolutely sure that all of the terms are contained in the documentation for the assurance. The agencies or their assignees must be named as the obligee with the ability to invoke payment. A specific standard for failure and a time period should be set. The regulatory agencies will want to determine who will conduct the completion of the project if the failure occurs.

Bonds. Surety bonds or construction bonds are purchased from companies similar to insurance companies. The bond company assumes the risk of the project proponent. A completion bond covers performance of a construction project that names as an obligee a lender or other party in a position to invoke the performance features of the bond without an obligation to provide funds to complete. A payment bond guarantees that all subcontractors on the project will be paid and the project is lien free. As with any insurance company, the standing of the company itself is important to assure payment in the case of project failure. The cost of a surety bond for a qualified contractor may range from less than one to four percent of the cost of the completion risk. Some surety companies may not be able to evaluate the risk of failure of a mitigation project making it hard to find a qualified surety. Since this risk is insured, a project lender will not count a bond against the borrower's total credit limit.

Letter of Credit. Credit letters are purchased through a lending institution by paying the principal amount of the completion risk directly to the bank. The project proponent loses the use of those funds for the term though they do earn interest less the cost of the credit letter. The cost is about one percent for a creditworthy borrower; however, a letter of credit may count against the borrower's total credit limit.

Escrow Account. The full amount of the completion risk is deposited into an escrow account with established escrow instructions concerning its release. Once again, the project proponent loses the use of the funds during the term. The cost of an escrow account may range from \$300 to \$700.

Nonprofit Account. The full amount of the construction risk is deposited with a nonprofit with established instructions concerning its release. The nonprofit may also monitor the project thereby assisting the regulatory agencies in their determination of performance. The nonprofit may also be authorized to correct damage or failure.

Property Analysis Record. A construction cost and risk analysis may be incorporated into a Property Analysis Record (PAR) report on a mitigation project so that the initial and capital funding can include financial assurance. The Center for Land Management (<http://www.cnlm.org>) developed the PAR, which is a computerized database that is effective in helping land managers calculate the costs of land management for a specific project. More detailed information on a PAR is provided in Chapter 6, *Financial Considerations*.

#### ***4.4.3. Long-term Protection***

Stewardship. Mitigation banking *requires that the wetland functions of the bank be maintained over the long-term.* Most mitigation banks, like other wetlands in urbanizing



areas, are likely to be affected in the long-term by any number of off-site impacts. These may include invasive/exotic species, damaging trespass, and water quality deterioration.

Endowments. Endowments may be a possible way for sponsors to find an entity to accept the long-term responsibility for management of the bank through donation of the fee title or a conservation easement. Endowments are a common method of financing long-term stewardship and should be considered a cost of the project. Endowments ensure that long-term stewardship activities are conducted. Further, since stewardship activities are long-term, they will continue well beyond the current ownership of the bank. Establishing an endowment as a cost of the bank ensures that the funds needed for permanent stewardship are available for future operations and management.

Other Sources of Funding. Special districts also may be a possible source of long-term stewardship funding if a bank is established as part of a large development project. Before planning on a district, however, state requirements for special districts need to be scrutinized carefully to qualify the collection of taxes, expenditures on stewardship, distribution of funds, and the term of the district. Certain projects may look to government general funds or grants and donations for stewardship; however, their reliability may be questioned. General funds are subject to economic and political pressures from year to year and often cannot be protected for the intended use. Grants and donations are notoriously difficult to attract for stewardship activities, for example as compared to raising money for a new preserve.

## **4.5. PROTECTION ASSURANCE**

### ***4.5.1. Ownership***

Theoretically, development of a bank could occur using many types of interests in land. A bank could be developed on leased property if problems with the term of the lease, nonpayment of rent, and potential eviction can be overcome. Similarly, a bank could be developed on land owned by others under the terms of a conservation easement. The risk in this arrangement is that the easement holder must work with the owner of the land to overcome problems in the development or maintenance of the bank even though the two may have substantially different priorities. Ownership of the land by the bank developer provides more protection than a lease or a conservation easement. However, if the owner is not a dedicated conservation agency or organization, long-term protection is still subject to the owner's changing priorities, need for cash, sale to another user, foreclosure when there are loans, tax loss and so on.

Different types of players in wetland mitigation have varying motivations and incentives in developing a mitigation bank and may fill complementary roles in the overall process. The

different categories of players are broadly described as for-profit, nonprofit, and government. The following paragraphs describe the pros, cons and incentives for each type of player.

For-profit. For-profit bank developers are important contributors to the wetland mitigation banking industry. They are entrepreneurs who can visualize the demand and create the marketing, financial expertise, and investment capability to develop the bank and sell credits. For owners of land with substantial restoration capabilities, a mitigation bank is a significant alternative for capturing revenue from that land.

However, the requirement for long-term bank management may be less attractive to for-profit bank developers. There is little incentive for a for-profit entity to maintain ongoing activities once the credits have been sold and all potential profit has been collected. The project may become a liability to the for-profit developer as a non-earning asset. Also, long-term management of an endowment for stewardship places a significant responsibility on the bank manager to invest and distribute funds wisely. With few endowments, a single for-profit developer may have difficulty in diversifying investments appropriately to achieve long-term security.

Nonprofit. Nonprofit bank developers may have a strong interest in conservation but may not have the financial experience to create a wetland mitigation bank or the financial capability to invest in the development of a bank. However, as bank managers, a nonprofit's ongoing conservation mission is a suitable incentive for long-term stewardship. Depending upon its financial structure, a nonprofit may also be a suitable manager of endowment funds. One alternative to optimize the incentives for both types of developers is for the for-profit and nonprofit entities to work together. The for-profit entity could develop the wetland mitigation bank and then turn its long-term liability and management responsibilities over to a nonprofit entity.

Government. Government developers of banks often do so to overcome wetland restrictions on development in the community. In addition, the bank may ultimately have significant secondary use as recreation. For instance, banks in other states are being developed as part of public parks. As a result, they may also justify subsidizing the bank to reduce costs to developers with public funds, which has the effect of preventing or limiting private development of banks in the community.

For long-term management, governments often depend upon general funds rather than on endowment or a more secure source of funding. When governments do hold an endowment, they are limited to investments in bonds, which increases the size of the endowment required to produce a given level of stewardship funding. This subject is discussed further in Section 6.6, *Basis for Estimating Long-term Financial Assurance*.

#### **4.5.2. Conservation Easement**

Regardless of whether the land in a wetland mitigation bank is owned by a for-profit, nonprofit, or a government agency, a conservation easement to a third party increases the assurance of protection for its resources. A conservation easement is an exception to the title of property. Under an easement, a property owner gives away certain rights on the property but retains others. A conservation easement is recorded against the property and appears on a title report. The easement gives the easement holder the right to enforce the terms of the easement and provides penalties for non-compliance. According to ORS Section 271.715(3), a holder of a conservation easement is either a government agency or a nonprofit whose purpose is the preservation of natural resources.

In its simplest terms, an easement can be written to prevent development of the land. A more complete easement would require that the property remain a wetland site with a suitable range of resources, and that the owner maintain those resources over the long-term. An easement may also transfer certain management and monitoring activities from the owner to the easement holder if that arrangement is suitable to the long-term welfare of the site.

Nonprofits with a conservation mission may hold a conservation easement over private lands in a bank. The responsibility of the easement holder is to enforce compliance with the easement of the landowner. This is generally accomplished through regular inspections of the land, meetings with the landowner, and creation of a joint mission for stewardship of the bank. A nonprofit may hold a conservation easement jointly with the government wherein the nonprofit conducts the day-to-day activities of an easement holder but reports to the government when an unresolved compliance issue arises. Where the landowner is uninterested or not capable of certain activities required by the easement, the easement can transfer those activities to the easement holder. An experienced nonprofit will usually require an endowment to conduct its responsibilities under an easement that it holds.

For-profit and nonprofit landowners of banks are often required to donate conservation easements over the project. Although land trusts and other conservation nonprofits are willing to hold conservation easements if endowments are provided for their maintenance, governments may be less likely to do so. Even if an endowment is provided to an agency, their mechanisms for handling the endowment are constrained. For instance, the DSL, as the wetland regulatory authority, must hold a public hearing prior to acceptance of a conservation easement as the donee. Although the DSL has the regulatory authority to accept a conservation easement, in practice they do not because the tasks and costs associated with enforcement of the terms of the easement are not in legislatively approved agency budgets. Lastly, as mentioned earlier, budget processes and legislation limit access to and investment of the endowment.

Once again, the purpose of the easement is to assure the long-term conservation of the bank. The terms of the easement may differ between the types of landowners based on their different missions and financial resources. Conservation easements over for-profit landowners holdings,

recognizing their profit orientation, may opt for notice followed by straightforward financial penalties in the case of non-compliance. When a conservation nonprofit is the landowner, the more productive penalty may be notice followed by transfer of the property with the endowment to another organization.

#### ***4.5.3. Deed Restrictions***

A deed restriction also is a recorded exception to the title of property. It differs from a conservation easement in that it lacks explicit provisions for protection and enforcement. Although the deed restriction may be written as a benefit to the public, which allows the public to enforce the easement, in fact protection is less assured than when a specific entity is charged with enforcement. For instance, a successful conservation easement will allow the easement holder to enter the property for the purpose of reviewing the condition of the resources conserved. As noted above, it will specify the party responsible for enforcement. Third, it will usually provide an endowment to pay for the cost of review and enforcement. These provisions are difficult, impractical, or ineffective as provisions for deed restrictions.

If a conservation easement is held by an experienced agency or organization, enforcement, per se is seldom required. The conservation easement holder understands that regular communication with the landowner especially when the land is transferred to new owners is the most effective means of assuring that the goals for the project are achieved. This continuity is also impractical over the long-term under a deed restriction.

#### ***4.5.4. Covenants, Conditions, and Restrictions***

Many projects are developed as subdivisions with rules covering the use, character and development of the land. The land developer records the covenants, conditions, and restrictions on the property for the benefit of the developer and the purchasers of the lots, which makes the terms enforceable by the lot owner(s).

When a mitigation bank is included as one of the lots, the responsibility for its conservation purchases lies with the lot owner(s). Protection then becomes subject to the willingness and financial ability of a lot owner(s). With this form of protection, conservation properties have been developed as playing fields, picnic grounds, bike paths, or personal space.

## **CHAPTER 5: ENVIRONMENTAL CONSIDERATIONS**

### **5.1 OVERVIEW**

The regulatory agencies give careful consideration to the ecological suitability of a site(s) for achieving the goals and objectives of the mitigation bank and to assure that it possesses the physical, chemical and biological qualities to support establishment of desired characteristics and functions. This chapter provides information on the environmental considerations for establishing a mitigation bank in Oregon. Size and location of the site(s) relative to other ecological features, hydrologic sources, and compatibility with existing and potential land uses and watershed management plans are important factors. Also, it is important that ecologically significant aquatic or upland resources, cultural sites, or habitat for state- and federally-listed threatened and endangered species are not compromised in the process of establishing a mitigation bank.

### **5.2. MITIGATION BANK SITING CONSIDERATIONS**

The Oregon regulations (OAR 141-85-436) require that a bank sponsor address the following issues when siting a mitigation bank.

1. Banks will be sited in locations where they will cause the least conflict with other existing and potential land uses, while yielding the most functional benefits.
2. Ecological criteria to be considered in the siting of banks include:
  - a. Maintenance and enhancement of wildlife/fish habitat and corridors.
  - b. Reliability of hydrological sources.
  - c. Ability to provide stormwater storage/flood attenuation.
  - d. Ability to enhance the water quality of the watershed.
  - e. Ability to provide buffers for the site.
  - f. Ability to provide a diversity of wetlands.
  - g. Proximity to undisturbed uplands, wetlands or other riverine/aquatic systems.
  - h. Absence of disturbance by man (airports, dumping, vehicular intrusion, power-lines, pipelines, presence of exotic species, etc.).
  - i. Presence of rare plants/animals and the bank's ability to accommodate them.
3. Banks on public lands will be allowed provided that the public agency owning or having authority over the subject land(s) grants its approval and perpetually protects the land upon which the bank, and any associated buffer, is proposed.

Banks may be sited on public lands. Cooperative arrangements between public and private entities to use public lands for mitigation banks may be acceptable. In some circumstances, it

may be appropriate to site banks on federal, state, tribal or locally owned resource management areas (wildlife management areas, national or state forests, public parks, recreation areas). The siting of banks on such lands may be acceptable if the internal policies of the public agency allow use of its land for such purposes, and the public agency grants approval. Mitigation credits generated by banks of this nature should be based solely on those values in the bank that are supplemental to the public program(s) already planned or in place, that is, baseline values represented by existing or already planned public programs, including preservation value, should not be counted toward bank credits.

A number of other considerations apply to the siting of mitigation banks. *Size* is one of the considerations and usually, bigger is better. A larger site provides more opportunity for valuable habitat restoration and enhancement. A second consideration is that *unique is valuable*. Unique habitats and habitat assemblages should be preserved and used as a cornerstone of the mitigation bank. A related consideration is to *protect the sensitive*. Any existing sensitive habitat should be preserved and if possible enhanced as part of a banking project. Another consideration is that *native species are preferable to exotic species*. The presence of an exotic species may not mean that a site is unsuitable, but it usually means that restoration actions to restore native species will be needed.

Another siting consideration is to *maintain variety*. A variety of wetland habitat types are preferable to a monoculture. A diversity of habitats provides more opportunities for different fish and wildlife species. Also, *maintain a buffer area where possible*. A mitigation bank should have an adjacent buffer if at all possible, both to protect the wetlands from disturbance, and also to increase its habitat value for fish and wildlife. Buffers are discussed in more detail later in this chapter.

Another siting consideration is *hydrology*. It is preferable to have a mitigation site where there is an existing water source rather than trying to manipulate or create one. Without adequate hydrology, even a well-designed mitigation bank will not survive. Natural hydrology that does not need a great deal of human intervention to function over the long-term is preferable to a highly manipulated bank hydrology that requires frequent maintenance.

*Seed sources* are another siting consideration. A site that has an existing native plant seed source or that is adjacent to seed sources is preferable. Another consideration is *connectivity to other natural resource areas*. Proximity of a bank to other habitat areas such as rivers, parks or remnant forested areas increases the habitat value of the bank. *Historical function* is another consideration and, to the degree possible, mitigation banks should replace habitats that historically existed in the watershed.

### **5.3. FEDERAL ENDANGERED SPECIES ACT**

A mitigation bank must comply with all federal laws, including the ESA. The ESA is intended to protect and conserve species of plants and animals designated as threatened or endangered [Sections 2(b) and 2(c) of the ESA]. A mitigation bank could be subject to various provisions of the ESA depending upon the circumstances. First, a determination is needed as to whether a listed species may occur within the vicinity of the proposed bank. This information is available from the National Marine Fisheries Service (NMFS) and the USFWS (see Appendix C). If it is determined that a proposed bank may involve a listed species, additional information is collected and coordination with the USFWS or NMFS is necessary. Through this process, various options for complying with the ESA should be evaluated and may include Section 7 consultation or Section 10 conservation planning.

#### ***5.3.1. Section 7 Consultation***

Where a banking activity would require federal authorization or be contingent upon some other federal action, consultation under the ESA may be necessary. Figure 5-1 provides an overview of the informal consultation process. All federal agencies are required to comply with the provisions and use their authorities to conserve species [Section 7(a)(1)]. Section 7(a)(2) states that every federal agency taking an action that may affect listed species must consult with the USFWS or NMFS. The USFWS has jurisdiction over plants, terrestrial, and non-marine aquatic species, and the NMFS has jurisdiction over marine aquatic species including anadromous salmonids (with some exceptions). Consultation allows the USFWS/NMFS to provide their expertise to ensure that the agency is making effective choices to conserve listed species, and that the action would not jeopardize the continued existence of listed species. The non-federal banking entity requiring federal authorization may be considered an applicant and directly involved in the consultation [Section 7(a)(3)].

The general process and procedures for consultation involve close coordination with USFWS/NMFS and includes assessing the effects of the banking activities on listed species and taking steps to minimize any adverse effects. The federal agency along with the applicant would conduct the analysis of the activity and make a determination as to the extent of the effect of the action (either no effect, not likely to adversely affect, or likely to adversely affect the species). The USFWS/NMFS will respond and either concur with the assessment or reach a different conclusion. At the completion of consultation, USFWS/NMFS will provide final documentation indicating that the proposed action, potentially with conditions, is in compliance with the ESA.

The NMFS uses a habitat-based approach for evaluating the effects of an activity and determining whether the activity would jeopardize listed species. This approach considers the current status of species and biological requirements, the current ecological conditions supporting the listed species, and the anticipated effects of the proposed action. It is based on

the concept of comparing the results of the proposed action to a reference set of conditions that reflect natural habitat forming processes, or properly functioning conditions (PFC), which are described in the NMFS's *Habitat-based Approach to Section 7 Consultations*. The NMFS applies PFC as a tool for evaluating the action's effects on listed species in making ESA determinations of effect.



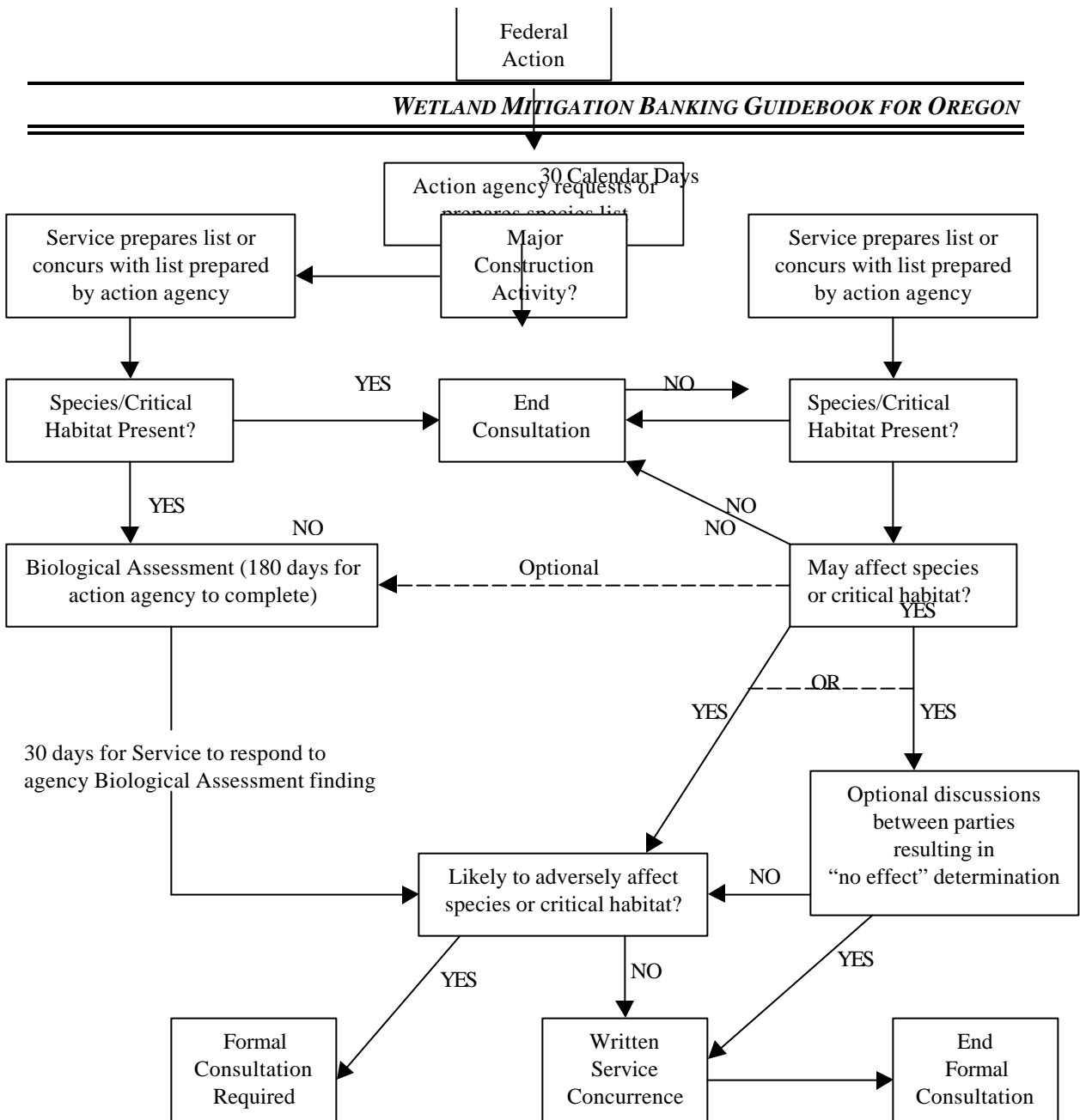


Figure 5-1. Informal Consultation Process

### **5.3.2. Section 10 Conservation Planning**

Where a banking activity would not involve federal approval or otherwise be considered a federal action, it may be necessary for the bank to seek an alternative approach to comply with the ESA. The development of a Habitat Conservation Plan (HCP), Safe Harbor Agreement, or Candidate Conservation Agreement with Assurances (CCAA) can provide a means for the USFWS or NMFS to review the proposed bank activities, address issues pertaining to incidental take, and acknowledge that it would meet the requirements of the ESA.

A HCP must accompany an application for an incidental take permit, which are required when non-federal activities will result in the “take” of a threatened or endangered species. “Take” is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect any threatened or endangered species. Harm may include significant habitat modification where it actually kills or injures a listed species through impairment of essential behavior such as nesting or reproduction. The purpose of the habitat conservation planning process associated with the permit is to ensure there is adequate minimizing and mitigating of the effects of the authorized incidental take. The permit allows a landowner to legally proceed with an activity that would otherwise result in the illegal take of a listed species.

The applicant is responsible for submitting a completed permit application and drives the development of an HCP. The necessary components of a completed permit application include a standard application form, an HCP, an Implementation Agreement (if required), and if appropriate, a draft National Environmental Policy Act (NEPA) analysis. While processing the permit application, the USFWS/NMFS will prepare an intra-Service biological opinion under Section 7 and an incidental take permit, and finalize the NEPA analysis documents. The mandatory elements of an HCP are shown below.

- An assessment of impacts likely to result from the proposed taking of one or more federally listed species for which permit coverage is requested.
- Measures the applicant will undertake to monitor, minimize, and mitigate for such impacts; the funding that will be made available to implement such measures; and the procedures to deal with unforeseen circumstances.
- Alternative actions to the taking that the applicant analyzed, and the reasons why such alternatives are not being utilized.
- Additional measures that the USFWS/NMFS may require as necessary or appropriate for purposes of the plan.

To encourage voluntary conservation efforts by property owners, the USFWS and the NMFS published joint final policies for a Safe Harbor Agreement and CCAA (*Federal Register*, June 17, 1999). The Safe Harbor Agreement provides incentives for private and other non-federal property owners to restore, enhance, or maintain habitats *for listed species*. Under the policy,

the agencies provide participating landowners with technical assistance and assurances that additional land, water, and/or natural resource use restrictions will not be imposed as a result of voluntary conservation actions that benefit or attract listed species. At the end of the agreement, the landowner would be allowed to return the property to its original “baseline” condition (however, a mitigation bank requires resource protection in perpetuity).

The CCAA is *for species that are not yet listed as endangered or threatened*, but are considered to be in decline and could be listed in the future (candidate species). The CCAA identifies actions that the landowner commits to take to conserve declining species. Landowners who participate will receive assurances from the agencies that no additional conservation measures above and beyond those contained in the CCAA will be required and that no additional land, water, or resource-use restrictions will be imposed upon them should the species become listed in the future. More information on the HCP process, the Safe Harbor Agreement, and the CCAA can be found in Appendix C.

#### **5.4. OREGON ENDANGERED SPECIES ACT**

In 1987, the Oregon Legislature passed an Endangered Species Act, which typically applies to state lands. The act gave the Oregon Department of Agriculture (ODA) responsibility over threatened and endangered plants (ORS 564.100 and OAR 603-73), and reaffirmed the ODFW’s responsibility for threatened and endangered fish and wildlife species (ORS 496.182 and OAR 635-100-080). Both agencies maintain a list of threatened and endangered species; ODFW also maintains a sensitive species list while the ODA maintains a candidate plant species list (see Appendix C). The ODFW lists can be found at <http://www.dfw.state.or.us>. State incidental take permit provisions also apply if actions are taken on publicly owned land, which may “take” (kill or obtain possession or control) or adversely affect a state-listed species or its habitat. A federal incidental take permit issued by the NMFS or USFWS supercedes the state provisions.

For any fish or wildlife species listed after 1995, the Oregon Fish and Wildlife Commission must adopt survival guidelines at the time of listing. Survival guidelines also are required retrospectively for previously listed species. The guidelines are intended to protect individual members of the listed species. Any activities on state land need to meet the survival guidelines. State agencies owning land that supports state-endangered fish or wildlife species are responsible for developing species management plans. The ODA consults with state agencies on a case-by-case basis for land actions that may affect listed plants. Any proposed bank on state land needs to be consistent with the state ESA for plants, fish, and wildlife, as well as with species management plans.

### **5.5. OTHER SPECIES OF CONCERN**

The Oregon Natural Heritage Program (ORNHP) maintains comprehensive databases for Oregon biodiversity, concentrating on rare, threatened, and endangered plants and animals (fish, amphibians, reptiles, birds, mammals, invertebrates). The ORNHP serves as a clearinghouse of information regarding site-specific locations for the occurrence, biology, and status of over 2,000 species throughout Oregon and is the state's only database of natural vegetation. Species status and distribution tables are available on the Internet at <http://www.heritage.tnc.org/nhp/us/or> (see Appendix C).

The ORNHP is a cooperator with the National Gap Analysis Program, which is conducted as state-level projects coordinated by the U.S. Geological Survey Biological Resources Division (<http://www.gap.uidaho.edu>). Gap analysis is a scientific method for identifying the degree to which native animal species and natural communities are represented in the present-day mix of conservation lands. Those species and communities not adequately represented constitute conservation "gaps." The purpose of the program is to provide broad geographic information on the status of species *not* listed as threatened, endangered or naturally rare, and their habitats to provide land managers, scientists, and others with the information they need to make better-informed decisions.

### **5.6. WATER QUALITY AND QUANTITY CONSIDERATIONS**

It is the responsibility of the bank sponsor to review all water quality data regarding the site conditions when assessing the feasibility of bank development. Some of the water quality and quantity considerations that need to be addressed are listed below.

- Identify the watershed basin and existing problems with baseline water quality. Review water quality limited streams and parameters of concern for the site.
- Sample the water proposed to flood the mitigation bank and the outflow to establish the baseline for the site. Note any proposed monitoring sites on a map, the proposed monitoring schedule, and water quality parameters monitored.
- Identify adjacent land uses and typical chemical inputs such as the chemicals used at adjacent farmlands. Will the run-off, tile drainage, injection wells, onsite drainfields or drift from spraying impact the wetland? Is there stormwater run-off from roads? Agricultural land uses are not a buffer from contamination; rather they are a major source of non-point pollution.
- Potentially polluted onsite and offsite run-on may need to be treated prior to use at the site. Note the proposed type of treatment or closure (e.g. injection wells, tile drain).
- Sampling for run-on is best done at first flush in the fall, not after the bulk of the rainy season (when the chemicals have been diluted by months of rainfall).

- Mitigation banks are usually composed of existing, created or restored wetlands. What amount of the proposed site contains a created or restored wetland?
- Show the proposed reference sites on the map (with the monitoring sites). Are there any regional groundwater concerns? Delineated vulnerable aquifers?
- Have any local wells been sampled for contamination? Note the location of local wells on the map. How will the existing wells be used or will they be closed? Abandoned wells must be properly closed under Oregon Water Resources Department (OWRD) rules, so that they do not become a conduit for pollution.
- What is the depth to the seasonal high water table? General direction of the groundwater flow? Aquifer type? Is the site in a proposed groundwater management area?
- Is there data on past flooding levels? Is any part of the site in a Federal Emergency Management Agency floodway? If so, identify it on a map (1996 flood elevations). Estimate the amount of additional flood storage that the mitigation bank may provide. Note any dikes or levees.
- Are there any existing site or adjacent site erosion problems? Note any potential hazards (landslides, unstable slopes) and water features (ditches, lakes etc). If the site is adjacent to a golf course, provide a copy of the *Integrated Pest Management Plan*.
- Identify any hazardous or toxic materials that are now or in the past have been stored at the site. Note shop areas, sumps, drywells, etc. Are there any upstream clean up sites or landfills within a mile of the site?
- Does the applicant have or need water rights for the mitigation bank? Are they available? Provide documentation from the OWRD.

The wetland mitigation bank cannot be used as a treatment facility itself. Storm water treatment facilities are considered “constructed wetlands” and are not regulated as waters of the state or waters of the United States; however, their discharge is regulated in the same way as any treatment system. Created and restored wetlands used as mitigation for loss of wetlands under Section 404 are considered to be waters of the state. Created and restored wetlands are protected as natural wetlands and cannot be used for conveyance or treatment of wastewater, unlike constructed wetlands. All water inputs to the bank must provide clean water.

### ***5.6.1. Water Quantity and Quality Controls***

The changes in land use influence the source generation levels of pollutants. The application of best management practice (BMP) options, besides creating changes to the infiltration gradients, also will potentially change the amounts of pollutants entering wetlands and streams. Another important factor is the mode of conveyance of the pollutants. When the changes in the infiltration gradients occur in such a way that larger surface-water runoff occurs due to decreased infiltration and ground water movement, attenuation processes such as filtration, adsorption, and dispersion, which act to decrease the pollutant concentrations, become limited.

Historically, most BMP options were “end-of-the-pipe” controls for example, the construction of wet or dry ponds to contain storm water runoff from impervious surfaces. However, with the acceptance of the concept of environmental sustainability, the use of dispersed control measures are necessary to make the components function as a system. Examples of dispersed controls that could be considered for implementation in a mitigation area are listed below.

Individual Land Parcels

encourage minimal use of directly-connected impervious areas  
provide small scale swales  
educate local residents on using chemicals, oils, fertilizers and disposal of residues

Conveyance and Pre-treatment Possibilities

use of swales, perforated pipes, and infiltration trenches

Pre-treatment Opportunities

use of infiltration basins, vegetated buffer areas, and off-line ponds

Final Treatment and Attenuation Options

use of retention and detention ponds, and constructed wetlands

The importance of the hydrologic regime to wetland ecology cannot be overemphasized. Hydrology is the driving force of a wetland and intermittent changes in the hydroperiods of wetlands influence species composition and productivity. The prediction of the response of a constructed or natural wetland to the storm water influent regime of an altered landscape, such as an urbanized area, is a significant challenge. Examples of the changes in the water regime of wetlands as related to storm water inputs are listed below.

Impacts Associated with Surface Flows

changes in mean water level  
changes in periodicity of water level fluctuations  
changes in flow circulation patterns

Impacts Associated with Groundwater Flows

changes in local water table levels

Impacts Associated with Creation of Channels in Wetlands

drainage of surface waters  
elimination of periodic flooding  
changes in retention storage

Impacts Associated with Water Quality

fertilization as a result of urban runoff inputs  
contributions from urban runoff including pollutants associated with turbidity,  
chemical pollution, and temperature

More information on water quality planning can be found in Chapter 7, *Technical Methods*.

## **5.7. HYDROLOGY**

The behavior of water is a critical concern to those aspiring to emulate a naturally functioning ecosystem. It heavily influences the plant species establishment and growth potential for a given site. It is also a critical habitat element unto itself (streams, lakes, ponds, and wetlands help support a large variety of aquatic and non-aquatic species). An understanding of the diurnal and/or seasonal behavior of water is critical to wetland restoration planning and management.

Wetland hydrology is typically divided into two categories: groundwater and surface water. Groundwater quantity, diurnal fluctuation, and seasonality can be monitored using wells established by a qualified hydrologist at strategic locations (usually dictated by preliminary explorations of the soils in the area). A well can provide information on the level of water table within the strata sampled and piezometers can help discern flow directions and hydrologic head or pressure. Field measures of water quality for groundwater are rarely required for a mitigation bank. Typically measured groundwater quality parameters may include, but are not limited to, temperature, pH, salinity, and hardness. Contaminants such as heavy metals or PCBs would require more sophisticated techniques conducted by qualified contaminant specialists.

Surface water quantity, diurnal fluctuation, and seasonality can be monitored using such instruments as staff gauges and flow meters. Wetland scientists are often interested in the seasonal and/or diurnal depths, volumes, directions of flow, and flow velocities of channel and sheet flows associated with their respective study areas. Typically measured surface water quality parameters include pH, salinity, temperature, nutrients, BOD, and turbidity. For more information on the methods employed to monitor and document hydrology, see Chapter 7, *Technical Methods* and the bibliography in Appendix B.

## **5.8. WETLAND AND UPLAND BUFFERS**

### **5.8.1. Wetland Buffers**

Vegetated areas can be preserved or managed as water quality buffers to some stream and wetland systems. This management or preservation consideration should not be contingent

upon an area's status as a jurisdictional wetland. Because the buffer advantages of wetlands derive from landscape setting rather than hydrologic properties or functions, non-wetland riparian zones that have the same landscape setting and, in all likelihood, more advantageous soil and hydrologic properties, should have a higher priority for preservation or enhancement within a mitigation area.

However, in most situations *wetlands should not be relied upon to act as buffers*. Rather, *they should be buffered*. Few wetlands are “sponges” for runoff; they are more likely to be runoff-generation sources and are typically ineffective compared to vegetated uplands in detaining runoff or effluent, though they may be quite efficient buffers for ground water flow, especially where anaerobic conditions are desired. Given these properties and the high biological values of many wetlands, it does not make sense to rely on wetlands to filter surface water pollution from adjacent land. Where the adjacent land use is intensive, such as urban/residential/industrial, chemical-intensive agriculture, high-density grazing, or waste applications, the wetland should itself be buffered from runoff by a vegetated filter strip.

Upland ecosystems are not systematically protected under any regulatory programs and thus lack a political constituency. The hydrologic values of such areas, in terms of water quality and reduction of runoff peaks, are likely to be higher on average than those of wetlands. Non-wetland environments are typically superior filters for runoff, particularly for storm water, than wetlands. Wetlands derive their buffer values mainly from their landscape settings and not from their hydrologic roles or properties. Thus, vegetated riparian buffer zones should be managed without regard to their wetland status. Further, many wetlands should themselves be buffered from intensive land uses and their associated runoff or effluent. Finally, the conservation of vegetated upland areas deserves further consideration.

Filtering runoff is only one of the hydrologic buffer roles of wetlands, and hydrologic buffering is only one of many wetland functions and values. The limitations of wetlands as buffers and the need to buffer wetlands themselves should be considered in assessing wetlands.

### ***5.8.2. Determining Wetland Buffers***

It is suggested that these guidelines be followed unless adequate justification is provided for using some other standard. To determine what a buffer should look like, the bank sponsor should refer to the reference site, which should be used as a template for the buffer or riparian system. Buffers need to provide different functions depending upon the site. For example, noise may be a special consideration as well as keeping out human disturbance or pets. Planning the buffer needs to be done concurrently with planning for the mitigation bank, and not as an afterthought.



Buffers should be considered both from the context of protecting sensitive aquatic systems (for example, flowing and open water systems, peat bogs, forested wetlands) and as necessary components of compensatory mitigation. The width of the buffer should consider the sensitivity and functions of the aquatic resource as well as the degree of potential or existing perturbations from adjacent land uses. This can be accomplished by hierarchically rating aquatic area sensitivity and the extent of existing or potential perturbations.

There are a number of existing and proposed methods to determine appropriate buffer width. Statewide Planning Goal 5 now requires protection of riparian corridors. The Goal 5 “safe harbor” for riparian corridors is 50 feet for fish-bearing streams with less than 1,000 cubic feet per second (cfs) average annual flow, and 75 feet for fish-bearing rivers with greater than 1,000 cfs average annual flow.

The Oregon State Forest Practices Act sets riparian management corridors between 50 and 100 feet for fish-bearing streams depending on the average annual flow. Wetlands with high sensitivity and disturbance potential have a 200-foot buffer, whereas those with low sensitivity and disturbance potential have a minimum 25-foot buffer. The USFWS provided the following guidelines for appropriate buffer widths.

High sensitivity/high perturbation (existing or potential):	200-foot buffer
High sensitivity/medium perturbation:	150-foot buffer
High sensitivity/low perturbation:	100-foot buffer
Medium sensitivity/high perturbation:	100-foot buffer
Medium sensitivity/medium perturbation:	75-foot buffer
Medium sensitivity/low perturbation:	50-foot buffer
Low sensitivity/high perturbation:	50-foot buffer
Low sensitivity/medium perturbation:	30-foot buffer
Low sensitivity/low perturbation:	25-foot buffer

### **5.8.3. Upland Buffers**

Credit may be given for the inclusion of upland areas in a bank only to the degree that such features increase the overall ecological functioning of the bank. If such features are included as part of a bank, it is important that they receive the same protected status as the rest of the bank and be subject to the same operational procedures and requirements. The presence of upland areas may increase the per-unit value of the aquatic habitat in the bank. Alternatively, limited credit may be given to upland areas protected within the bank to reflect the functions inherently provided by such areas (for example, nutrient and sediment filtration of stormwater runoff, wildlife habitat diversity) which directly enhance or maintain the integrity of the aquatic ecosystem and that might otherwise be subject to threat of loss or degradation. An appropriate

functional assessment methodology can be used to determine the manner and extent to which such features augment the functions of restored, created or enhanced wetlands and/or other aquatic resources. Currently, there is no functional assessment methodology that will translate the functions of such bank attributes into credit units.

## **5.9. CULTURAL RESOURCES**

A cultural resource investigation is needed to assess the likelihood that sensitive archaeological or historic resources are present within the mitigation bank site. In Oregon, the cultural resources program is mandated by state legislation (ORS 358, ORS 390) and administrative rule (Chapter 736, Divisions 50 and 51). The State Historic Preservation Office (SHPO) is located in the Oregon Parks and Recreation Department. The SHPO administers several state statutes relating to historic preservation, including:

- ORS 358.475 - Special Assessment of Historic Property
- ORS 358.622 - State Advisory Committee on Historic Preservation
- ORS 358.612 - Authorities of State Historic Preservation Officer
- ORS 358.635 - Preservation of State-owned Historic Property
- ORS 358.680 - Oregon Property Management Program
- ORS 358.905 - General Archaeology
- ORS 390.235 - Issuance of Archeological Permits
- ORS 097.740 - Protection of Indian Graves

Information on archaeological sites is not available to the general public. Qualified researchers may make an appointment to search the archaeological files. The SHPO develops and maintains inventories of historic and prehistoric properties. This process has relied mainly on information provided by local governments and federal agencies, and the information is stored in both electronic and paper formats. The SHPO staff can assist individuals wishing to search the Statewide Inventory of Historic Properties. In cooperation with the Advisory Council on Historic Preservation, the SHPO has a role in reviewing the impacts of federal undertakings on resources that are either listed or eligible for listing in the National Register of Historic Places. State law places responsibility for issuance of permits to excavate archaeological sites with the SHPO.

## **5.10. LAND USE**

Oregon has a statewide program for land use planning which is a partnership between the state and its cities and counties. State land use laws require that all cities and counties engage in planning and that local land use programs (comprehensive land use plans and implementing land use regulations) be consistent with state standards known as the Statewide Planning Goals. The Statewide Planning Goals and consequently, local land use programs, address a variety of issues

from forest, farmland, and natural resource protection to urbanization, public facilities and services, and economic development.

The DLCD is the agency responsible for administering the statewide land use planning program. The DLCD, with guidance from its citizen commission called the Land Conservation and Development Commission (LCDC), works to ensure on-going local compliance with the goals and other land use rules, provides financial and technical assistance to local governments for planning work, and develops land use policy as directed by the Oregon Legislature, the Governor, or LCDC.

Although Oregon has state laws on land use, land use planning and zoning occurs at the local level. Cities and counties write and amend local comprehensive plans, zone land, and administer permits for local land use actions like conditional uses and variances. The state does not administer land use permits or zone land. Therefore, questions regarding land zoning or local permits should be directed to the applicable city or county planning department. If you are inquiring about land inside city limits, then call the city planning department. If the land in question is outside an urban growth boundary, call the county planning department. For lands in between the city limits and an urban growth boundary, in most cases you should contact the county planning department first.

Local land use programs do change over time as a result of specific land use proposals, changing local needs, amendments to laws, and other circumstances. There are two primary processes for amending local programs – plan amendments and periodic review. This guidebook does not provide detailed information on either process; you may contact the affected local government or DLCD for additional information on these processes.

Briefly, plan amendments can be initiated by a local government or by a private party and must be sent to DLCD for review. Amendments can address either a specific project site or jurisdiction-wide policies. Appeals of local plan amendments go to the Oregon Land Use Board of Appeals. Periodic review is a longer-term process involving major evaluation and revisions to local land use programs. State law defines if and when cities or counties must go through the periodic review process. The DLCD works with local governments in periodic review to develop work programs, and local governments then proceed with the individual tasks on their work programs. Eventually, any local land use changes resulting from work on periodic review tasks are adopted at the local-level and sent to DLCD for review. Some periodic review decisions may also involve review by LCDC, either at the request of DLCD or in response to a third party appeal. Interested parties can participate in either the plan amendment or periodic review processes, following procedures defined in state rules and local land use programs.

Another important variable of Oregon's statewide land use planning program is the requirement for state agency compliance. The state land use law and associated rules require that state agencies administer their programs affecting land use in conformance with the statewide planning goals and local land use programs. State agencies have developed coordination programs which outline their agency plans, programs, and other actions affecting land use and setting forth procedures for assuring compliance with local land use programs. These state agency coordination programs also outline how local governments can participate in various state agency decisions.

Land use is an important variable that must be addressed during the process of siting a mitigation bank. The bank sponsor needs to consult with the affected local government early in the process to obtain and discuss land use information. For example, is a mitigation bank allowed by the local plan policies and zoning ordinances applicable to the proposed site? Will activities associated with operation of the bank also be allowed? Also, will uses and activities existing or allowed on adjacent lands be compatible with the long-term goals for the mitigation bank?

The DSL mitigation banking rules (OAR 141-85-421) require that a bank sponsor address land use as follows. In addition, the rules allow both affected local governments and the DLCDC to participate as members of the MBRT.

- Provide a description of former and current uses of the property.
- Consider adjacent existing, potential, and proposed land uses; banks are to be sited where they will cause the least conflict with existing and potential land uses.
- Obtain written approval from the local government, addressing zoning for the property and adjacent lands, overlay zones, permit requirements, policies, etc.
- Identify proposed long-term protection measures (this could include a proposal to work with local government on any plan/zoning issues such as seeking a protective designation).
- Send a complete prospectus and instruments to the affected local government(s).

As plans for a mitigation bank evolve, the bank sponsor and approving agencies need to remain cognizant of whether the activities necessary to operate the bank over time are permitted or conditionally allowed in the applicable zones. This should have been considered initially during the siting process to the extent practicable, but new issues could arise as more details about the bank are determined. Once a bank is operating, it may be appropriate to send periodic updates on bank status to the affected local government, particularly if planning and zoning tools are being used to help achieve long-term protection.

### *5.10.1. Special Advisories for Specific Land Use Topics*

Agricultural Lands - Goal 3. State land use laws and consequently, local land use programs require the preservation and maintenance of Oregon's farmlands for farm uses. The uses and activities allowed on farmlands are defined in Goal 3, Agricultural Lands, at OAR 660-33, and in local programs. Currently, Goal 3 and the associated state rules specifically allow for the creation, restoration, or enhancement of wetlands on high value and other farmlands. However, a mitigation bank on farmlands will generally require some type of local approval. Local review and perhaps local permits will generally be required. Also, if the development of a bank includes additional activities such as mining of topsoil, development of park or other recreational facilities, etc., then those additional activities must also be allowed on farmlands under state and local land use programs.

When siting a mitigation bank on or near farmlands, it is recommended that the bank sponsor and approving agencies consider a number of variables unique to farmlands. For example, you probably will want to obtain information on the soil type(s) at the bank site. Also, you should consult with adjacent landowners to determine if the bank might negatively affect drainage of adjacent farmlands and to address whether agricultural practices occurring nearby, such as tiling or spraying, might negatively affect the bank.

Natural Resources, Scenic and Historic Areas, and Open Spaces - Goal 5. This goal requires local governments to inventory various natural resources, including wetlands, riparian corridors, and wildlife habitats, and to adopt local programs for those resources determined to be significant. Goal 5 and associated state rules do not in any way mandate that a local government must always protect a mitigation bank site as a significant Goal 5 resource. In fact, protecting a bank site as a Goal 5 site may be contrary to the goal and rules if the site does not have some special natural resource values prior to wetlands creation, restoration, or enhancement work. If a mitigation bank is ultimately successful at creating, restoring, or enhancing wetland habitat functions and values, then there may be some point in the future when the wetlands and other wildlife habitat in the bank would qualify as significant natural resource under Goal 5. However, a local government is not necessarily precluded from working with the bank sponsor to adopt other planning and zoning tools to address a bank site. Also, a bank sponsor will need to know if there are any protected Goal 5 resources at or near the bank site so that impacts to those resources can be avoided.

Economic Development - Goal 9. According to this goal, local governments must provide for an adequate supply of commercial and industrial lands. Through comprehensive plans and associated land use regulations, local governments are to limit uses and activities on Goal 9 lands to those compatible with commercial and industrial uses. It may be possible to develop a mitigation bank in a commercial or industrial zone if the local land use program will allow for this, but close coordination with the affected local government would be required. Also, the

approving agencies and bank sponsor would have to carefully consider whether commercial and industrial uses that exist or could occur nearby would be compatible with the goals of the bank.

Urbanization - Goal 14. This goal generally requires that lands inside urban growth boundaries be designated for urban uses and lands outside urban growth boundaries for rural uses. But this goal does not specifically prohibit mitigation banks in either urban or rural settings. The land use issues that must be addressed during bank siting and operation may be quite different for urban vs. rural settings. Another difference is that some cities will have a completed wetlands inventory and possibly a wetland ordinance for lands inside urban growth boundaries, but similar inventories are unlikely to exist for lands outside urban growth boundaries. Consult the affected local government for land use designations and allowed uses and activities.

Willamette River Greenway - Goal 15. If a mitigation bank were proposed adjacent to the Willamette River, then the elements of the applicable local comprehensive plan for this goal would need to be addressed. The first step would be to determine if the project site was within the greenway boundary as identified in the local plan. If the site is within the greenway boundary, then the next step is to determine what uses and activities are allowed within the greenway by the local jurisdiction. Local governments must designate permissible uses for both urban and rural stretches of the greenway. Mitigation bank activities, where permissible, will likely require local compatibility reviews.

Estuarine Resources - Goal 16. The requirements of this goal would be important for the siting of a mitigation bank in one of Oregon's estuaries. Estuaries are defined to include estuarine waters, tidelands, tidal marshes, and submerged lands, generally extending up to head of tidewater. Under Goal 16, estuarine restoration is generally considered permissible where adverse estuarine changes have occurred such as from erosion or sedimentation; degradation of spawning areas or other habitats, where diked marshes have been abandoned; and in areas with poor water quality. Goal 16 and local estuary management plans that implement the goal, address both passive restoration (use of natural processes) and active restoration (removal of fills, water treatment, etc.). Depending on location, restoration work might require a conditional use permit or other approval from the affected local government.

For an estuarine project, the bank sponsor will need to consult with the affected coastal city or county to determine how the proposed mitigation site is zoned. Estuarine areas, like uplands, are subject to zoning either as natural, conservation, or development zones with the types of uses and activities allowed being most restrictive in natural zones and least restrictive in development zones. But within development zones, the local government, bank sponsor and approving agencies must consider whether a proposal for restoration work is compatible with the other development uses existing or allowed.

In addition to checking on the aquatic zoning, a bank sponsor should review the applicable local estuary management plan for estuarine areas locally identified as appropriate for habitat creation, restoration, and enhancement activities. Some of these sites have been protected further by local governments as “mitigation sites.” Per goal 16, mitigation sites were to be areas where compensatory mitigation for permitted dredge or fill activities in intertidal or tidal estuarine habitats could occur. Other sites have been listed as potential restoration sites, areas where past activities had adversely affected estuarine systems. These inventoried sites provide a place for a bank sponsor to start looking for appropriate mitigation bank sites. If interested in a site not already identified for mitigation or restoration by the local government, then the sponsor would need to work with that local government to amend the local estuary management plan to officially designate the site for mitigation or restoration (also see Goal 17 discussion).

Coastal Shorelands - Goal 17. Coastal local governments were required to identify coastal shorelands (areas along the shores of the Pacific Ocean, coastal lakes and estuaries), adopt a coastal shorelands boundary, and develop programs to address the various resources and uses covered under Goal 17. For example, the goal requires coastal local governments to protect riparian areas, major marshes and significant wildlife habitats, defined as areas deriving habitat quality primarily from the association with coastal waters. The bank sponsor needs to know if there are protected Goal 17 resources at or near the mitigation bank site so that impacts can be avoided.

Goal 17 also addresses mitigation sites by directing local governments to identify and protect sites that may be used to help fulfill the mitigation requirements of Goal 16. These locally identified sites provide a place for a bank sponsor to start looking for appropriate mitigation bank sites. If interested in a site not already identified for mitigation or restoration by the local government, then the sponsor needs to work with the local government to officially designate the area as a mitigation site. For the new site, the bank sponsor will need to know if there are any protected Goal 17 resources at or near the site so that impacts can be avoided (also see Goal 16 discussion).

Adjacent to estuarine development zones, specific coastal shoreland areas have been designated for water-dependent development activities (navigation, industrial, commercial). It would be very problematic to site a mitigation bank in these areas as the long-term protection of the mitigation bank will not generally be compatible with existing water-dependent development and could preclude future water-dependent developments. The bank sponsor also must be aware of shoreland areas designated for dredged material disposal, as a mitigation bank would not necessarily be compatible with disposal activities.

## **5.11. SUCCESS CRITERIA**

### ***5.11.1. Monitoring***

The bank sponsor is responsible for assuring the success of the debited restoration, creation, enhancement and preservation activities at the mitigation bank. Therefore, it is extremely important that an enforceable mechanism be adopted establishing the responsibility of the bank sponsor to develop and operate the bank properly.

The bank sponsor is responsible for monitoring the mitigation bank in accordance with monitoring provisions identified in the Mitigation Bank Instrument to determine the level of success and identify problems requiring remedial action. Monitoring provisions should be based on scientifically sound performance standards prescribed for the bank. Monitoring should be conducted at time intervals appropriate for the particular project type and until such time that the authorizing agencies, in consultation with the MBRT, are confident that success is being achieved (the performance standards are attained). The period for monitoring will typically be five years after the last credit is sold or the bank ceases to sell credits. However, it may be necessary to extend this period for projects requiring more time to reach a stable condition, such as forested wetlands, or where remedial activities were undertaken. Annual monitoring reports should be submitted to the agencies in accordance with the terms specified in the Mitigation Bank Instrument. More information on monitoring and performance standards can be found in Chapter 7, *Technical Methods*.

### ***5.11.2. Adaptive Management***

Past experience has demonstrated that even after careful planning and implementation, a mitigation bank site may not meet the performance standards established and agreed upon by the MBRT and the sponsor. A response to this concern is a concept known as adaptive management, in which mitigation banking and restoration actions are recognized as being part science and part art. While each action is considered an experiment with a hypothesis about what the outcome will be, there also is a realization that there may be unanticipated results. More information on adaptive management can be found in Chapter 7, *Technical Methods*.



## **CHAPTER 6: FINANCIAL CONSIDERATIONS**

### **6.1 OVERVIEW**

This chapter discusses the necessary financing arrangements so that the mitigation bank will be completed and maintained as approved. The regulatory agencies in Oregon are primarily interested in knowing that the bank sponsor has evaluated the costs and can provide assurance of financial capability to pay all costs including contingencies. Concepts discussed in this chapter include contingency plans, risk assessment, perpetual management costs, credit sales projections, market share, pricing of credits, cash flow, and estimating bank development and long-term financial assurances. A theoretical vernal pool mitigation bank was developed by the Center for Natural Lands Management to illustrate the financial concepts. The theoretical bank contains 160 acres equivalent to an expected 70 wetland credits. The information and tables contained in this chapter may be useful in developing projections and documentation for a potential mitigation bank.

### **6.2. CONTINGENCY PLAN/RISK ASSESSMENT**

Having credible budgets for the several stages of mitigation bank development are essential in setting bond requirements. Also crucial is a realistic risk analysis of the project. The risk analysis can increase or decrease the amount needed for financial assurance. Such a thorough understanding of the project by the bank sponsor indicates a willingness to incorporate its real hazards into the planning process.

#### ***6.2.1. Construction***

Construction risk can be minimized using appropriate soils, hydrological, and engineering studies. If site conditions are found not to be appropriate, risk factors must be assessed and contingency planning undertaken. Cost overruns particularly for grading and water control systems are common and should be accounted for using additional studies or adding contingency costs to the budget. Fixed price contracts with reliable firms may help. Construction delays, if there is a narrow seasonal construction window, can be costly particularly if loans are financing the project. The first winter after construction is often difficult as contours have been changed and vegetation is sparse. Erosion or collapse may have to be corrected at some cost. Part of the construction bond may be held through the first winter to assure that storm damage can be repaired. A risk analysis of potential damage may be effective in proposing a reasonable release schedule.

### **6.2.2. *Vegetation***

Vegetation or revegetation will be subject to particular success criteria, or performance standards, before all credits can be released for sale. The success criteria for a five-year monitoring program (after the last credit is sold) can take many forms. One criteria may be that the percentage of plants of certain indicator species be evident at a specified time following planting and/or seeding. Another criteria may be a percentage of ground coverage. Evaluating the potential causes of vegetation loss may help determine the size of bond or fund necessary to ensure replanting of vegetation that meets the criteria. The appropriateness of soils, slope and water regimes are prime factors for the success of plantings. The quality of plant stock, its origin in the local area, the removal of exotic and invasive species, and the care of new plantings also are of high importance. Certain processes such as irrigation may be essential to short-term growth of new vegetation. However, watering for too long may simply result in vegetation success during the monitoring period and failure thereafter when irrigation is withdrawn. In some instances, a more natural planting regime using successional stages may be advised. Although a slower process, the project may show greater potential for long-term success.

### **6.2.3. *Events Beyond Control***

Events beyond the sponsor's control, such as earthquakes or major flooding occurring after the release of credits, may affect the financial analysis since the permitting agencies may stop the sale of any unsold credits. If all credits have been sold and all short-term financial assurances have been released, coordination should be undertaken with the agencies to utilize the land and long-term stewardship provisions. This coordination should result in the best available conservation package under the circumstances.

### **6.2.4. *Credit Sales***

The rate and price of credit sales is a major risk factor for the welfare of the project. The lost cash flow may reduce the ability of the proponent to complete or maintain the project. Further, it may undermine the ability to establish an endowment or other mechanism for long-term protection. A well-documented market study of credits will help establish reasonable cash flow assumptions and determine risks.

## **6.3. CALCULATING COSTS**

Developing budgets for the bank is a first priority of the financial evaluation of a site. The PAR (see Section 4.4.2) may help in calculating bank establishment costs. The budgets described here cover three steps in the bank's development: bank establishment costs, initial and capital costs, and perpetual management costs to maintain the resources. These budgets may be used as inputs into the cash flow analysis of the bank.

**6.3.1. *Calculating Bank Establishment Costs***

Table 6-1 itemizes the components of the bank establishment costs for the theoretical vernal pool mitigation bank, which totals about \$1,436,000 before contingency and administration. Bank establishment costs include acquisition, site construction, biotic surveys, and habitat restoration. These are upfront costs necessary to create the bank.

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*Table 6-1. Bank Establishment Costs, Theoretical Vernal Pool Mitigation Bank*

Task List	Specification	Unit	No. of Units	Cost per Unit (\$)	Annual Cost (\$)	Time Years	Total Cost (\$)
<b>Acquisition</b>							
Property search	Purchase	Acres	160	7,000.00	1,120,000.00	1.0	1,120,00.00
Negotiation	Permits	L. hours	260	40.00	10,400.00	1.0	10,400.00
Legal assistance	Prepare/review documents	C. hours	36	160.00	5,760.00	1.0	5,760.00
Subtotal							1,136,160.00
<b>Site Construction/Maintenance</b>							
Fence, installed	Barbed wire 4 strd.	Lin ft.	10,000	1.40	14,000.00	1.0	14,000.00
Gate, classic	Powder River	Item	2	189.75	379.50	1.0	379.50
Vehicle barrier	Median barrier	Lin ft.	60	45.00	2,700.00	1.0	2,700.00
Subtotal							17,079.50
<b>Biotic Surveys</b>							
Project mgt.	Supervise/coord.	L. hours	26	45.00	1,170.00	8.0	9,360.00
Plant ecologist	Agency reports	C. hours	30	45.00	1,350.00	8.0	10,800.00
Wetland specialist	Field svy./reports	C. hours	40	45.00	1,800.00	8.0	14,400.00
Ornithologist	Field svy./reports	C. hours	24	45.00	1,080.00	8.0	8,640.00
Monitor climate	Field data collect.	C. hours	12	45.00	540.00	8.0	4,320.00
Subtotal							47,520.00
<b>Habitat Restoration</b>							
Soil test	Test soil	Item	1	150.00	150.00	1.0	150.00
Hydrology test	Hydrology testing	Item	1	75.00	75.00	8.0	600.00
Bid documents	Plans & specs	L. hours	10	45.00	450.00	1.0	450.00
Project mgt.	Supervise/coord.	L. hours	60	45.00	2,700.00	1.0	2,700.00
Salvage/stockpile topsoil	Salvage topsoil	L. hours	30	30.00	900.00	1.0	900.00
Grading & fill	Cut and fill	Cu. yd.	15,000	5.00	75,000.00	1.0	75,000.00
Earthmoving	Labor	L. hours	40	21.00	840.00	1.0	840.00
Erosion control	Slope stabilization	L. hours	60	15.00	900.00	1.0	900.00
Seed procurement	Native grass, 85%	Lb.	45	85.00	3,825.00	1.0	3,825.00
Seeding	Hand seeding	Acre	27	700.00	18,900.00	1.0	18,900.00
Plant procurement	Trees, shrubs	Tree pot	250	1.00	250.00	1.0	250.00
Plant procurement	Trees, shrubs	Tree pot	75	4.50	337.50	1.0	337.50
Plant procurement	Shrubs	1 gal.	250	3.00	750.00	1.0	750.00
Plant procurement	Trees, shrubs	5 gal.	75	15.00	1,125.00	1.0	1,125.00
Revegetation	Plant installation	L. hours	100	15.00	1,500.00	1.0	1,500.00
Suppl. Planting	Plant replacement	L. hours	30	15.00	450.00	8.0	3,600.00
Plant protection	Chicken wire cage	Item	80	15.00	1,200.00	1.0	1,200.00
Irrigation, temp.	Code overhead sys	Acre	5	19,500.00	110,000.00	1.0	110,000.00
Irrigation system	Maintenance, labor	L. hours	60	15.00	900.00	1.0	7,200.00
Refuse collection	Maintenance, labor	L. hours	20	15.00	300.00	8.0	2,400.00
Exotic plant control	Hand removal	L. hours	80	15.00	1,200.00	8.0	9,600.00
Exotic plant control	Rodeo	Gal.	10	35.00	350.00	8.0	2,800.00
Exotic plant control	Mow	L. hours	25	15.00	375.00	8.0	3,000.00
Subtotal							235,527.50

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<b>Total before Contingency &amp; Administration</b>		1,436,287.00
<b>Contingency &amp; Administration</b>		
Contingency		143,628.70
Administration		315,983.14
Subtotal		459,611.84
<b>TOTAL</b>		<b>1,895,898.84</b>

### 6.3.2. Calculating the Initial/Capital Costs

Initial and capital costs occur during the first year of bank operation – after the bank has been established but before the endowment has produced sufficient income to provide long-term stewardship. These costs are itemized on Table 6-2 for the theoretical bank and total about \$12,000. They include protection of the site, outreach/visitor services, required reporting, other reporting on the physical and financial conditions of the site, office maintenance, field equipment, and operations expense. This budget includes a contingency factor of 10 percent and administrative costs of 22 percent of direct costs.

*Table 6-2. Initial and Capital Tasks and Costs, Theoretical Vernal Pool Mitigation Bank*

Task List	Specification	Unit	No. of Units	Cost per Unit (\$)	Annual Cost (\$)	Time Years	Total Cost (\$)
<b>Public Services</b>							
Patrolling	Patrol/easement	L. hours	24	15.00	360.00	1.0	360.00
Sign, polyethelene	21"x14" 10 word	Item	2	9.00	18.00	1.0	18.00
Sign, redwood	Interpretive 4'x6'	Item	1	650.00	650.00	1.0	650.00
Interpretive lit.	Copy	Page	2,000	0.10	200.00	1.0	200.00
Comm. outreach	Meetings	L. hours	12	30.00	360.00	1.0	360.00
Subtotal							1,588.00
<b>Reporting</b>							
Database mgt.	Data input	L. hours	15	30.00	450.00	1.0	450.00
Photodocumentation	Field survey	L. hours	2	30.00	60.00	1.0	60.00
Photo materials	Film/process	Roll	2	13.00	26.00	1.0	26.00
Aerials, 2 sets color	Standard 9"x9"	Flight	1	425.00	425.00	1.0	425.00
Monthly reports	Events for month	L. hours	12	30.00	360.00	1.0	360.00
Annual reports	Summary	L. hours	4	30.00	120.00	1.0	120.00
Annual work plan	Plan/PAR budget	L. hours	3	30.00	90.00	1.0	90.00
Management plan	Initial report	L. hours	65	30.00	1,950.00	1.0	1,950.00
Subtotal							3,481.00
<b>Office Maintenance</b>							
Fax machine	All in one machine	Item	1	300.00	300.00	1.0	300.00
Computer, PC	Laptop, pentium	Item	1	1,500.00	1,500.00	1.0	1,500.00
Software	MS Office upgrade	Item	1	282.00	282.00	1.0	282.00
Subtotal							2,082.00
<b>Field Equipment</b>							
Vehicle	Mileage	Mileage	400	0.32	128.00	1.0	128.00
Camera 35mm/lens	Low-end camera	Item	1	520.00	520.00	1.0	520.00
Power tools	Misc. tools	Item	1	250.00	250.00	1.0	250.00
Subtotal							898.00
<b>Operations</b>							
Audit	CPA audit	Item	1	200.00	200.00	1.0	200.00
Network interview, contracts	Maintain contracts	L. hours	8	26.00	208.00	1.0	208.00
Insurance	liability, ownership	Acres	160	0.55	88.00	1.0	88.00

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Project accounting	Setup/maintain	L. hours	16	26.00	416.00	1.0	416.00
Subtotal							912.00
<b>Contingency &amp; Administration</b>							
Contingency							896.10
Administration							1,971.42
Subtotal							2,867.52
<b>TOTAL</b>							<b>11,828.52</b>

#### 6.3.4. Calculating Perpetual Management Costs

A perpetual management budget is the average annual costs of bank stewardship in perpetuity. These ongoing costs are itemized on Table 6-3 for the theoretical bank and total about \$9,600 per year. The budget should be directed at maintaining the bank's resources in accordance with permit requirements. As such, it should be the inspiration for, or be coordinated with, the management plan. Also, this budget serves as the basis for an endowment.

Table 6-3. Ongoing Tasks and Costs, Theoretical Vernal Pool Mitigation Bank

Task List	Specification	Unit	No. of Units	Cost per Unit \$	Annual Cost (\$)	Divide Years	Total Cost (\$)
<b>Site Construction and Maintenance</b>							
Fence - installed	Barbed wire	Lin. ft	10,000	1.40	14,000.00	40	350.00
Subtotal							350.00
<b>Biotic Surveys</b>							
Project mgt.	Supervise/coord.	L. hrs	30	30.00	900.00	1	900.00
Plant ecologist	Field svy./reports	L. hrs	30	30.00	900.00	2	450.00
Wetland specialist	Field svy./reports	L. hrs	24	30.00	720.00	3	240.00
Monitor climate	Field data collect.	L. hrs	6	45.00	270.00	1	270.00
Subtotal							1,860.00
<b>Habitat Restoration</b>							
Water quality test	Water quality	Item	1	45.00	45.00	5	9.00
Subtotal							9.00
<b>Habitat Maintenance</b>							
Exotic plant control	Hand removal	L. hrs	12	15.00	180.00	1	180.00
Exotic plant control	Herbicide 41%	Gal.	4	108.60	434.40	1	434.40
Exotic plant control	Backpack spray	L. hrs	12	15.00	180.00	1	180.00
Subtotal							794.40
<b>Public Services</b>							
Patrolling	Patrol/easement	L. hrs	24	15.00	360.00	1	360.00
Sign, polyethelene	21"x14" 10 wds.	Item	2	9.00	18.00	5	3.60
Sign, redwood	Interpretive 4'x6'	Item	1	650.00	650.00	15	43.33
Interpretive lit.	Copy	Page	2,000	0.10	200.00	1	200.00
Comm. outreach	Meetings	L. hrs	12	30.00	360.00	1	360.00
Subtotal							966.93
<b>General Maintenance</b>							
Sanitation control	Collect/disposal	L. hrs	12	15.00	180.00	1	180.00
Subtotal							180.00
<b>Reporting</b>							

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Database mgt.	Data input	L. hrs	15	30.00	450.00	1	450.00
Photodocument.	Field survey	L. hrs	2	30.00	60.00	1	60.00
Photo materials	Film/process	Roll	2	13.00	26.00	1	26.00
Aerial photos	Standard 9"x9"	Flight	1	425.00	425.00	5	85.00
Monthly reports	Events for month	L. hrs	12	30.00	360.00	1	360.00
Annual reports	Summary	L. hrs	4	30.00	120.00	1	120.00
Annual work plan	Plan/PAR budget	L. hrs	3	30.00	90.00	1	90.00
Management plan	Initial report	L. hrs	65	30.00	1,950.00	5	390.00
Subtotal							1,581.00
<b>Office Maintenance</b>							
Fax Machine	All in one	Item	1	300.00	300.00	5	60.00
Computer, PC	Laptop	Item	1	1,500.00	1,500.00	6	250.00
Software	MS Office	Item	1	282.00	282.00	4	70.50
Subtotal							380.50

*Table 6-3 (continued). Ongoing Tasks and Costs*

Task List	Specification	Unit	No. of Units	Cost per Unit (\$)	Annual Cost (\$)	Divide Years	Total Cost (\$)
<b>Field Equipment</b>							
Vehicle	Mileage	Miles	400	0.32	128.00	1	128.00
Camera 35mm/lens	Low-end camera	Item	1	520.00	520.00	8	65.00
Power tools	Misc. tools	Item	1	250.00	250.00	5	50.00
Subtotal							243.00
<b>Operations</b>							
Audit	CPA audit	Item	1	200.00	200.00	1	200.00
Network interview, contracts	Maintain contracts	L. hrs	8	26.00	208.00	1	208.00
Insurance	Prop. liability, ownership	Acres	160	0.55	88.00	1	88.00
Proj. accounting	Setup/maintain	L. hrs	16	26.00	416.00	1	416.00
Subtotal							912.00
<b>Contingency &amp; Administration</b>							
Contingency							727.68
Administration							1,600.90
Subtotal							2,328.58
<b>TOTAL</b>							<b>9,605.41</b>

Creating such a budget is not easy, partly because it attempts to forecast the very distant future and partly because it is a difficult calculation. The average annual costs of the sample project are provided by available software using the PAR, which attempts to simplify both of these difficulties. The PAR assists this process using a series of databases that are reminders of potential impacts to the property. The databases highlight property features such as invasive exotic species, water quality changes, current and future uses on the surrounding lands, taxes and special districts, and administrative costs.



A database of stewardship tasks, which can be chosen, adjusted, and augmented further simplifies the process of projecting potential costs. It includes specifications for each task including the unit measurement of the task, the number of units, the cost per unit, and periodicity. Periodicity refers to the task schedule such as once a year, once every two years, or once every 35 years that is essential for arriving at an annual average stewardship expense. Long-term stewardship costs include maintaining fences and gates. Permanent monitoring is sufficient to provide assurance to the regulatory agencies that the permit requirements are being met. The budget in Table 6-3 includes items such as:

- Monitoring of grasses and plants to ensure adequate regeneration and distribution, water quality testing and review by a wetland specialist.
- Exotic plant control to allow native species to flourish.
- Access for the public calibrated to support the natural resources, provide outreach, and encourage responsibility for the site and education. Access requirements include patrolling, maintaining trails, and signs.
- Administration including reporting, contracts, financing, audits, bookkeeping, legal, hiring and training, and oversight.

#### **6.3.4. Calculating the Endowment**

As shown in Table 6-4, *Financial Summary*, using \$9,600 a year as the estimate for average annual management expenses results in an endowment of \$192,000 (5 percent capitalization rate calculated as  $\$9,600/0.05 = \$192,000$ ). The capitalization rate is defined as the proportion of the endowment that can be used each year for stewardship while maintaining the purchasing power of the endowment over time. The 5 percent capitalization rate is commonly used by universities and hospitals for their permanent endowments and is based upon long-term trends of investment returns and inflation. These long-term trends are typically 9.0 to 9.5 percent returns for diversified, balanced portfolios, 4.0 to 4.5 percent for inflation, and a small percentage for investment management fees. It is assumed, therefore, that the endowment is invested in a diversified, balanced portfolio earning an average of 9.0 to 9.5 percent, of which 4.0 to 4.5 percent are retained by the endowment to offset inflation, leaving about 5 percent per year for stewardship.

*Table 6-4. Financial Summary, Theoretical Vernal Pool Mitigation Bank*

<b>Property Analysis Record</b>	<b>Rate (%)</b>	<b>Total (\$)</b>
<i>Initial Financial Requirements</i>		
I & C Revenue		0
I & C Management Costs		8,961
I & C Contingency Expense	10.00	896
Total I & C Management Costs		9,857
I & C Administrative Costs of Total I & C Management Costs	20.00	1,971
Total I & C Costs		11,828

Net I & C Management and Administrative Costs		11,828
<i>Annual Ongoing Financial Requirements</i>		
Ongoing Costs		7,276
Ongoing Contingency Expense	10.00	728
Total Ongoing Management Costs		8,005
Ongoing Administrative Costs of Total Ongoing Mgt. Costs	20.00	1,601
Total Ongoing Costs		9,606
<i>Endowment Requirements for Ongoing Stewardship</i>		
Endowment to Provide Income of \$9,606		192,100
Endowment per Acre is \$110		
Ongoing Management Costs Based on 3.00% of Endowment per Year		
Ongoing Mgt. Funding is \$9,606 per Year Resulting in \$3 per Acre per Year		
<b>Total Contribution</b>		<b>203,928</b>

#### **6.4. BASIS FOR CASH FLOW PROJECTIONS**

Table 6-5 provides a sale credit analysis for the theoretical vernal pool mitigation bank and is being used to illustrate the concepts discussed in this section.

*Table 6-5. Evaluation of Historical and Projected Vernal Pool Impacts Using Urban Services Boundary Area, Acres within County*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<b>Historic Mitigation Require.</b>																
<b>per Adjusted 404 Permits</b>																
Acres					1.97	8.47	1.27	5.13	2.97							
<b>County Construction Cycle</b>																
Growth in housing units	17,629	13,060	7,927	5,645	4,013	4,982	3,291	3,432	3,862							
Regional projection										7,750	7,750	8,532	8,532	8,532	8,532	8,532
Urban Services Boundary Area (growth housing units)	812	812	812	812	985	985	985	985	1,434							
Regional projection										1,434	2,434	2,434	2,434	2,434	2,434	2,434
Medium & High Density Pool																
Minor zones (growth in housing units)	149	149	149	149	529	529	529	529	844							
Regional projection										844	1,657	1,657	1,657	1,657	1,657	1,657
<b>Proj. Vernal Pool Impacts</b>																
Urban Serv. Boundary (1)					0.0020	0.0086	0.0013	0.0052	0.0021	0.0038	0.0038	0.0038	0.0038	0.0038	0.0038	0.0038
Regional Projection Impacts										5	9	9	9	9	9	9
Medium & High Density Pool																
Minor zones (1)					0.0037	0.0160	0.0024	0.0097	0.0035	0.0071	0.0071	0.0071	0.0071	0.0071	0.0071	0.0071
Regional projection impacts										6	12	12	12	12	12	12
<b>Preservation Banking</b>																
Historic Preservation																
Mitigation @ 2:1					3.94	16.94	2.54	10.258	5.942							
Urban Serv. Boundary Area										11	19	19	19	19	19	19
Medium & High Density Pool																
Minor zones					3.94	16.94	2.54	10.258	5.942							
Regional projections										12	23	23	23	23	23	23
<b>Preserv. Credit Demand</b>																
Mitigation Bank Credit Sales					0	6	10	7	4							
Share of Mitigation										76%	76%	76%	76%	76%	76%	76%

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Urban Serv. Boundary Area							
Proj. Mitigation Using Share	8	14	14	14	14	14	14
Medium & High Density Pool							
Proj. Mitigation Using Share	9	18	18	18	18	18	18

*Table 6-5 (continued). Evaluation of Historical and Projected Vernal Pool Impacts Using Urban Services Boundary Area, Acres within County*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<b>Preservation Credit Supply</b>																
Credits currently available									68							
Credits to be available									150							
Subject credits									70							
Total									288							
<b>Credits Available Over Time</b>																
Urban services boundary area										280	266	251	237	223	209	195
Medium and high density pool minor zones										279	266	244	226	208	190	173
<b>Subject Share-Allocation by Supply</b>																
Urban Services Boundary Area										2.0	3.4	3.4	3.4	3.4	3.4	3.4
Medium and High Density Pool Minor Zones										2.2	4.3	4.3	4.3	4.3	4.3	4.3
<b>Subject Share-Allocation by Number of Suppliers</b>																
Urban Services Boundary Area										2.1	3.5	3.5	3.5	3.5	3.5	3.5
Medium and High Density Pool Minor Zones										2.3	4.4	4.4	4.4	4.4	4.4	4.4

Note (1): Relationship described by historical mitigated acres divided by change in housing units in defined area.

#### **6.4.1. *Historic Permits***

Information regarding historic permits can be gathered from the Corps, DSL, city, county, and/or the ODFW. Such permits should indicate the number of acres requiring mitigation, the number of mitigation acres required, and the specific type of mitigation. The permits generally require analysis to ensure which mitigation projects are comparable in habitat type and service area to the subject. Such figures provide a historic baseline for the total mitigation in acres needed for an area.

#### **6.4.2. *Historic Growth and Business Cycle***

The mitigation demand baseline may be adjusted for other factors affecting the area. A community whose rate of growth is increasing may experience heightened levels of mitigation demand. Further, the stage of the business cycle measured by building permits may alter the level of mitigation demand from year to year. Since many mitigation banks expect to sell all credits within a relatively short period of time, the business cycle may be the major determinant of a reasonable baseline for mitigation requirements. In Table 6-5, permits are compared to the rate of building permits issued in the community to illustrate the likely trend of impacts. Although not shown in the table, alternate trend lines may be used to determine the sensitivity of the final result.

#### **6.4.3. *Future Growth Areas***

The baseline may be further altered by a specific analysis of the areas where planned growth is likely to occur. New development areas may be found on the general plan and by inquiring in the local planning department. Wetland maps may be available from the Corps or the DSL for the specific area if local wetland inventories have been completed. If not, National Wetland Inventory maps and soils maps may be helpful. The coincidence (or non-coincidence) of development and wetlands or hydric soil areas may make a substantial difference in the baseline mitigation demand. Table 6-5 utilizes the sophisticated development projections maintained by the community for minor zones that help pinpoint the rate at which vernal pools may be impacted.

#### **6.4.4. *Agency Protocol***

Agency protocol is also a factor in determining an appropriate level of demand. Historic permits will demonstrate the replacement ratios required. Changes in these ratios can dramatically increase or decrease the level of mitigation credit demand. A similar change can occur through adjustments in the agency's view of appropriate service areas. In Table 6-5, the replacement ratio for preserved pools is 2:1.

#### **6.4.5. Market Share**

Market share is the share of the appropriate mitigation credit demand baseline that the bank can reasonably capture. It is determined by the available supply of alternative mitigation including other mitigation banks and by price. The following steps are followed in Table 6-5 to arrive at an assumption of demand for an individual bank.

The demand for vernal pool mitigation does not readily translate into sales for mitigation banks since many project proponents may incorporate mitigation on-site or off-site as separate mitigation projects. The resource agencies may require on-site or off-site mitigation actions rather than allow the use of a mitigation bank, particularly where the impacts proposed will destroy healthy, well-functioning wetlands. In general, purchases of bank credits are generally limited to development projects where the impacts are small and the wetland resource is clearly degraded. In the example, impacts mitigated by the banks are generally less than one acre.

By comparing the sales at banks with the overall demand for mitigation, some idea of the banks' share of the whole can be found. In the example, some 76 percent of mitigation demand was accommodated at banks. This is currently a much higher percentage than has been seen in Oregon to date in areas where mitigation banks are established, although it is expected that use of banks will increase as the concept gains acceptance. This proportion fits well enough with other parameters of the market to assume such an allocation in the future. Mitigation credit supply can be determined through a survey of mitigation banks that can provide the service area with mitigation of a comparable habitat type. It should be accompanied by information on the remaining unsold credits, marketing techniques, ease of purchase, and the price of credits.

Combining the available credits, the planned bank credits, including half of the credits in the sample bank, provide the total anticipated supply to be compared with the demand. Depending upon the circumstances, a bank developer may be concerned about a supply that is more than 5 to 10 years worth of demand. The bank credits, as a proportion of the total supply, may be the best estimate of the share of each year's demand attributable to that bank. While this assumption is hard on small banks, it reflects the greater marketing power of larger banks. Alternatively, demand may be divided by the number of banks in the market area to determine an average share per bank.

Price may be the most significant variable affecting market share. Particularly problematic to an entrepreneur are mitigation banks where some or much of the cost of the project is subsidized or uncounted. Unlike most products, cities, counties, other government agencies, and nonprofits are creating many banks. Where any one of these discounts land cost, ignores returns to invested capital, hides maintenance costs under other activities (such as farming), the

ability of mitigation banking entrepreneurs to recover all costs is made more difficult. In addition, the ability of the agencies through minor oversight to impose slightly varying requirements on different banks may greatly skew the relative marketability of those banks. Lower than expected credit sales may limit a sponsor's response to unanticipated risk. The combination of low sales and some level of vegetation failure, for instance, may be devastating to the project. Establishing the financial assurances up front and limiting risk provides safeguards for the bank. On the other hand, agreements that allocate a portion of credit sales revenue to establish the financial assurance may greatly impact the project but carry significantly less risk for the sponsor.

Similarly, lower than expected credit sales can severely impact the long-term viability of the bank in other ways. This may occur when an allocation from credit sales establishes the endowment for perpetual stewardship. In one format, a percentage, say 10 percent of each credit sale goes to the endowment fund. If credit sales require a 10-year rather than a 5-year sales period, the endowment will not be producing sufficient income for stewardship until the 11<sup>th</sup> year. Other variations are more secure for the project but less so for the developer. For instance, the endowment could be established with 100 percent of the credit price until full when the remaining credit sales could be fully allocated to the recovery of the developer's costs.

#### **6.4.6. Credit Pricing**

Table 6-6 shows a survey of existing and potential banks for the theoretical mitigation bank. Considering competitor's costs, the price of the planned credits is about \$57,500 per acre.

*Table 6-6. Survey of Existing and Planned Vernal Pool Mitigation Banks*

Project	Location	Date Opened	Approved P/C* Credits	P/C* Credits Sold	Price Schedule Based on Type, Purchase Size	
					Low (\$)	High (\$)
<b>Existing Banks</b>						
Bank 1		Feb 98	P-50	6 reserved 6-7 sold	50,000	70,000
Bank 2	Outside USB	Jul 96	P-37.18; C-21	P-12, C-4	55,000	65,000
Bank 3	Inside USB	Jul 97	P-47	P-17	60,000	60,000
Bank 4	Outside County	Jan 95	C-30	C-15.2	65,000	70,000
Bank 5	Outside County	Mar 97	P-58	P-27.9	65,000	70,000
Total Estimated Preservation Credit Sales = 42						
Total Estimated Preservation Credits Remaining = 101						
<b>Potential Banks</b>						
Bank 6	Outside USB	---	C-38, used	C-50 build/sell	---	---
Bank 7	Outside County	---	P-62	---	---	---
Bank 8	Inside USB	---	Acres P-166	---	---	---



\* Note: P = Preservation Credits; C = Creation Credits

#### **6.4.7. Cash Flow Schedules**

The foregoing suggests that a great deal of flexibility in their agreement with the regulatory agencies may be available to a sponsor provided that the research and assumptions are reasonable and presented in an appropriate manner. This section presents some assumptions and an example of a cash flow summary (Table 6-7).

Relying on a conservative estimate of sales of 3.5 credits per year, the bank developer decides to build half of the project. All costs of the project may be scheduled over the development and sales period. Application costs, land acquisition costs, restoration, restoration management and agency monitoring may be shown in the first section as part of the requirements of establishing the bank. Similarly, the sample bank shown in Table 6-7 is divided into two phases and each phase requires four years of restoration maintenance and agency monitoring.

The management cost category includes longer-term items. During the first year, initial and capital items may include establishing the endowment, hiring managers, building fences, posting signs, establishing an accounting system and the other setup costs of a new project. Some permanent stewardship tasks will be needed by the second year, when the bank managers are working on maintenance items, public access, continuing accounting, insurance functions, and so on.

In these early years, some typically long-term stewardship functions may be performed as part of bank establishment. These might include exotic species control, bank stabilization, plant maintenance and agency monitoring. Once bank establishment is complete, however, the full array of long-term stewardship kicks in. In Table 6-7, this occurs in the ninth and tenth years.

The endowment contribution is the next item in the cash flow. The example assumes that a fixed amount (10 percent) of the endowment is paid into an investment account each year until the endowment is fully funded. Payments into the fund are adjusted each year for inflation (assumed to be four percent) to maintain purchasing power (already donated funds are invested to also offset inflation as will be shown later). It is assumed in this case that permanent stewardship expenditures are deducted from the endowment contribution each year.

Summing all costs adjusted for inflation reveals that the cost of the project before financing is estimated at \$1,918,000. Using the demand estimate for sales of credits at about 3.5 credits a year and a price at \$57,500 adjusted for inflation per credit provides a revenue estimate of \$2,416,000 and cash flow of \$731,000. A cumulative cash flow reveals cash shortfalls,

however, which may be financed at a rate of nine percent. This adjustment requires about \$158,000 in financing costs. Net cash flow projects a profit of about \$573,000 for this project.

*Table 6-7. Cash Flow Summary, Theoretical Vernal Pool Mitigation Bank*

	Per Acre	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Total
<b>Acreage</b>			80				80						160
<b>Bank Establishment</b>													
Bank Authorization		15,000											
Land Acquisition	7,000		560,000				560,000						1,120,000
Restoration	1,500		120,000				120,000						240,000
Restoration Mtn.			5,000	4,000	3,000	2,000	5,000	4,000	3,000	2,000			28,000
Agency Monitoring			6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000			
Subtotal		15,000	691,000	10,000	9,000	8,000	691,000	10,000	9,000	8,000			1,436,000
<b>Bank Management</b>													
Initial and Capital			6,000				6,000						12,000
Perm. Stewardship				2,500	2,700	2,300	4,000	4,500	4,500	2,500	9,200	9,200	41,400
Endow. Contribution	19,200												
Endow. Inflation Adjustment	4%		19,200	19,968	20,567	21,184	21,820	22,474	23,148	23,843	24,558	25,295	222,057
Endow. Contrib. Less Perm. Stewardship			19,200	17,468	17,867	18,884	17,820	17,974	18,648	21,343	15,358	16,095	
Subtotal		0	25,200	19,968	20,567	21,184	27,820	22,474	23,148	23,843	24,558	25,295	234,057
Total Cost		15,000	716,200	29,968	29,567	29,184	718,820	32,474	32,148	31,843	24,558	25,295	1,670,057
Cost Inflation Adj.	4%	15,000	744,848	32,413	33,259								1,918,586
<b>Revenues</b>													
Credits Available			9	9	0	0	9	8		0	0	0	35
Credit Sales			3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	35
Sales Price	57,500												
Price Inflation Adj.	4%		57,500	59,800	62,192	64,680	67,267	69,958	72,756	75,666	78,693	81,840	
Credit Sale Revenue		0	201,250	209,300	217,672	226,379	235,434	244,851	254,645	264,831	275,425	286,442	2,416,229
<b>Cash Flow</b>		(15,000)	(514,950)	179,332	188,105	197,195	(483,386)	212,377	222,497	232,988	250,966	261,147	731,172
Cum. Cash Flow		(15,000)	(529,950)	(350,618)	(162,513)	34,682	(448,704)	(236,327)	(13,829)	219,159	470,025	731,172	
Financing Costs	9%	(1,350)	(47,696)	(31,556)	(14,626)	0	(40,383)	(21,269)	(1,245)	0	0	0	(158,125)
Net Cash Flow		(16,350)	(562,646)	147,776	173,479	197,195	(523,769)	191,108	221,252	232,988	250,866	261,147	573,047
<b>Endowment Calc.</b>													
Perm. Stew. Calc. (Ann. Avg. Expense)		9,600											

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Inflation Adjusted	4%	9,600	9,984	10,383	10,799	11,231	11,680	12,147	12,633	13,138	13,664	14,210	
Endowment Capital.	5%	192,000											
Endowment Inflated	4%	192,000	199,680	207,667	215,974	224,613	233,597	242,941	252,659	262,765	273,276	284,207	
Endowment Contrib.		0	19,200	17,468	17,867	18,884	17,820	17,974	18,648	21,343	15,358	16,095	
Endowment Invested	9%		19,200	38,396	59,719	83,977	109,355	137,171	168,165	204,643	238,418	275,971	

Having a profitable project is one of the goals of a mitigation bank. However, there should be two tests for the success of a bank. The mitigation bank is undertaken to provide permanent compensation for habitat losses. Therefore, the analysis should also reveal whether the project supports the cost to establish the bank (itemized in Table 6-1), initial and capital management costs (itemized in Table 6-2), and an endowment for permanent stewardship is at an appropriate level when it is paid up (this is shown in the endowment calculation at the bottom of Table 6-6).

As previously discussed, to maintain its purchasing power the endowment must grow by the inflation rate each year. Whether this is true for the theoretical bank is tested in the cash flow, where the endowment is inflated at a rate of four percent per year. This reveals that the endowment should equal \$284,000 when the endowment contributions are complete. For the sample bank, however, the endowment reaches \$276,000 at the end of the period for an \$8,000 shortfall.

Such a shortfall can be remedied in many ways. The bank developer may contribute such an amount at the beginning of the project. The necessary portion of the permanent stewardship expenses during the period may become expenses of the project rather than deducted from the endowment contribution. In any case, the mitigation bank should be able to demonstrate through reasonable assumptions that both profitability and an appropriate endowment for permanent stewardship should result from the project.

## **6.5. ESTIMATING BANK ESTABLISHMENT FINANCIAL ASSURANCES**

Bank establishment includes the acquisition of land rights, restoration/creation of wetlands and their maintenance. Risk for hydrology and plants are inherent in the creation and restoration of wetlands for which financial assurance is expected. Estimates of repair for incorrect water depths, poor water quality, and drought are important evaluations. In the sample bank, the vernal pool wet acreage is about 40 percent of the total area to be protected. Hydrology studies and existing storm drain infrastructure indicate that the existing pools have been fully functioning with on-site rainfall. Since there will be no created pools, financial assurance for this aspect is unnecessary.

The sample bank contains numerous invasive plant species on the uplands, and cattle grazing has destroyed much of the wetland plant abundance. Spot removal of some invasive species will suffice in the short-term and redirected grazing activities are expected to control other species. Seeding using new inoculate will be needed in some ponds to help crowd out non-natives. This step bears some risk. Therefore, 50 percent of the inoculate cost and its application, or \$10,000, is to be available for remediation through a letter of credit for four years during which time monitoring will verify the level of plant success. The amount will be renewed at the beginning of the second phase.

## **6.6. ESTIMATING LONG-TERM FINANCIAL ASSURANCE**

An endowment can be used as the long-term assurance for retaining the resource values of the mitigation activity. An endowment also may be an advantageous way for sponsors to fund the permanent stewardship of a bank. Further, the establishment of an endowment helps the bank developer to find a third party willing to accept permanent responsibility for the project under the bank permit either through the transfer of fee title or donation of a conservation easement. Whoever holds the endowment does so essentially for the benefit of the public and must, therefore, provide sufficient safeguards.

Government agencies can hold such funds but they are subject to two limitations. The funds cannot be held in trust for the stewardship of the property and, therefore, could be swept into the general fund. Secondly, according to the Oregon Constitution, government agencies are limited to investments in bond accounts rather than balanced portfolios of stocks and bonds. Long-term returns of balanced portfolios of stocks and bonds have averaged from 9.0 to 9.5 percent over the past 35 years. Government investments in bond portfolios have averaged from 6.0 to 7.0 percent depending upon the length and maturity allowed under state law. Since the average inflation rate has been 4.0 to 4.5 percent over this period, the amount of money available for stewardship is about 5.0 percent for balanced portfolios and 3.0 percent for bond portfolios. For the theoretical mitigation bank, a government held endowment producing \$9,600 per year in stewardship funding would have to be \$320,000 rather than the \$192,000 projected for a balanced portfolio.

Endowments are most secure if invested through a fiduciary that also holds the funds in a trust account. The fiduciary should be instructed by a strict set of written investment guidelines as to the kinds of investment instruments to be used, the allocation of the endowment between instruments, and reporting of the results. Withdrawals should be planned well in advance so that the fiduciary may maintain the correct proportion of dollars in investments at all times. The board of directors of the organization holding the funds should have a regular review of the investment holdings and returns.

Small accounts or individual endowments cannot properly be invested in a balanced portfolio because they are too small to be sufficiently diversified and because management fees would be too large. In this case, seeking a nonprofit with a substantial endowment and strict fund accounting, or a community foundation with a compatible set of investment guidelines, may be the better alternative.

Annual reporting of financial results should be available to the regulatory agencies. With activity, monitoring, and financial reports, the agencies' understanding and confidence in the mitigation banking process may encourage them to further simplify and streamline the mitigation process.

## **CHAPTER 7: TECHNICAL METHODS**

### **7.1 OVERVIEW**

A comprehensive discussion of the technical methods that may be required for implementing a wetland mitigation bank is beyond the scope of this guidebook. However, there are some general principles that will apply in most cases. This chapter discusses wetland site classification, assessment, and monitoring, as well as providing additional information on hydrology and water quality. Anyone considering establishing a mitigation bank should recognize the need to have a *long-term working relationship with the MBRT* through each stage of the banking process (from initial planning, through implementation, and until monitoring is completed, which can last from five to ten years after the last credit is sold). This will usually require that the bank sponsor retain the services of person(s) qualified to employ the appropriate technical methods prescribed by the MBRT.

### **7.2 WETLAND SITE CHARACTERIZATION**

Wetland site characterization can be generally divided into two major categories: wetland classification and wetland functional assessment: For this guidebook, the term “characterization” means classification and assessment jointly applied.

#### ***7.2.1. Wetland Classification***

Wetland classifications generally entail the application of a systematic approach to partition and map the salient characteristics of a given parcel of wetland(s), often applied either at a site specific scale, usually based on property ownership, or on a regional scale often based on landscape units such as watersheds or ecoregions. Wetland classifications are used to display wetlands in a format that enables the reader to better understand the geographic position and relationships, overall structure, and some of the dynamic processes governing the appearance and function of the classified wetland(s).

Two commonly used wetland classification systems are the USFWS *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin 1979) and the Corps’ *A Hydrogeomorphic Classification for Wetlands* (Brinson 1993). The USFWS classification is hierarchical starting at the systems level, for example, lacustrine (lakes), riverine (rivers), estuarine (estuaries), palustrine (generally isolated from large bodies of water), and marine (seacoast). The next level is wetland class, which is largely defined by vegetation and exposed substrate (forested, scrub-shrub, emergent, unconsolidated bottom, etc.). One advantage of this system is that it has been widely used and applied since 1979. Also, wetlands over the



entire United States have been classified using this system on *National Wetland Inventory* maps superimposed on U.S. Geological Survey quadrangle sheets.

The hydrogeomorphic classification has three primary components: geomorphic setting (landscape position), water source and its transport (precipitation, ground water, and lateral flows), and hydrodynamics (vertical fluctuations, unidirectional flows, and bi-directional flows such as tides). These primary components are interdependent and are thought to help explain core principles that drive wetland functions. While this classification is relatively recent in development, it has been expanded to include riparian areas and has been linked to a hydrogeomorphic assessment system that uses reference sites to help define wetland and riparian functional indexes.

### ***7.2.2. Wetland Functional Assessment***

Wetland functional assessments are tools developed to help wetland scientists and managers define the specific functions of a particular wetland or suite of wetlands, and hierarchically describe (often ordinal) the level of each of those defined functions. Wetland assessment tools are generally designed to help managers make decisions on the relative importance of the wetland(s) being assessed and to subsequently make decisions such as wetland protection vs. development, mitigation ratios, and mitigation bank credits. They are helpful planning tools because they can help predict changes in wetland functions over time (driven by natural processes, direct and indirect actions by humans, or both) and to subsequently monitor both the predicted and unpredicted changes.

Wetland areas are commonly reported to provide a wide array of functions beneficial to humans as well as fish and wildlife. These functions include, but are not limited to, the following:

- food chain support;
- fish and wildlife habitat;
- flood retention and desynchronization;
- water pollution abatement;
- sediment filtration and retention; and
- groundwater discharge and recharge.

Wetland scientists recognize that all wetlands do not perform all functions, a given wetland does not perform all functions equally, and wetland functions may fluctuate daily, seasonally, and over historic and geologic time. Over the years, efforts have been made to develop methods to measure and track these functions. Because of the complexity of wetland functions (spatially and temporally), the state-of-the-science available to understand them, and the short time frames in which resource managers and planners have to make critical wetland resource decisions, most of these methods are based on assumed surrogate measures of wetland functions.

Wetland assessment methods include, but are not limited to the USFWS *Habitat Evaluation Procedures* (HEP), the USEPA *Wetland Evaluation Techniques* (WET), and the Corps *Hydrogeomorphic Approach*. There are also other methods available that are not mentioned here. Since each assessment methodology has its advantages and disadvantages, selection of a method must be based on such considerations as:

- The ability of the method to assess the wetland functions anticipated in your study area.
- The data requirements needed to utilize the method as compared to the existing background information available, and the expertise and experience of those charged with applying the method.
- The usability of the output derived from the method as compared to the questions needing answers in order to make sound management decisions.
- The cost and time available to apply the method.

### ***7.2.3. Applied Wetland Characterizations***

Applied wetland characterizations, as used for mitigation banks, generally require both a wetland classification and a functional assessment. The two are, by their inherent nature, inextricably linked to one another. It is generally not possible to provide a functional assessment without first organizing a foundation for that assessment through a wetland classification.

Characterizations are often done at different scales ranging through small-scale (large area), using features such as physiographic provinces or river basins; mid-scale (medium area), using 4<sup>th</sup> and 5<sup>th</sup> field U.S. Geological Survey hydrologic units or watersheds superimposed on 7.5 and/or 15 minute quadrangles; and large-scale (small area), using site specific maps with ratio scales roughly between 1:600 and 1:2400. Most of the characterization work for wetland mitigation banks will be done at the large-scale or a combination of large-scale and mid-scale.

Specific wetland characterization tools may be recommended to a potential mitigation bank sponsor by the MBRT when meeting to discuss the development of the Mitigation Bank Instrument. The MBRT can use these tools to help interpret the effectiveness of the proposal, and in reviewing the subsequently applied mitigation actions described in the Mitigation Bank Instrument.

In order to determine if the mitigation bank actions are successful, the MBRT will often recommend that these tools be applied at the four different phases of the project:

- The pre-existing site condition before any mitigation actions are taken (baseline).

- The proposed site condition anticipated before the actual mitigation actions are completed (this is generally in the form of a plan that includes measurable performance standards).
- The “as-built” site condition report (a document displaying what the site actually looks like immediately after the earthwork and vegetation planting is completed).
- Monitoring reports gauging how the site changes over time and whether the planned performance standards are being met (note that this phase of the project may require that the wetland characterization be applied at each subsequent iteration of monitoring in order to accurately document change over time).

It is important to note that the value added to a wetland bank’s functions *over and above baseline* will equal the net credit derived from the mitigation bank actions and hence, the net credit available for sale by mitigation bank sponsors. Mitigation bank sponsors generally *do not get credit* for the functions already existing at their respective bank sites before their mitigation actions are applied. The only exception may be if they had specifically pre-arranged with agreeing resource and regulatory agencies to protect unique and highly valuable wetlands that were threatened by development.

Wetland mitigation bank as-built site condition reports should document the actual physical dimensions of the site after construction is complete and any unavoidable deviations that may have occurred from the original plan. They should also include, large-scale maps (preferably superimposed on high resolution air photos) displaying elevations (preferably one or two foot contour intervals), herbaceous community locations, and tree and shrub densities and locations after planting. The monitoring reports should display site conditions as measured using MBRT-approved monitoring protocol(s) and performance standards. They should also provide a summary section discussing whether performance standards have been met and any necessary contingency or adaptive management measures needed.

## **7.3 MONITORING**

### ***7.3.1. Monitoring the As-built Bank Site***

Monitoring the as-built mitigation bank site requires MBRT members to ask the following kinds of questions (depending on the site) as they inspect the work.

- After mitigation bank site construction and planting is completed, did the contractor meet all the specifications of the planned site design?
- Is the bank site located where it was designated to be in the plan?
- Is the bank site the size and shape it was designed to be?
- Is the site graded to the design elevations and are those elevations low enough to intercept the anticipated ground water hydrology?

- Are the planted trees, shrubs, and herbs, in the locations, elevations, densities, and absolute numbers indicated in the mitigation plan?
- Were the specified ditches filled/blocked off as indicated in the mitigation plan?
- Were the tide gates removed or modified as specified?
- Do the woody debris placements meet the plan specifications?
- Were the berms and water control structures built to the design specifications?

The MBRT members realize that it is common during mitigation site construction to run into unanticipated problems that often require changes in the initial site design. That is why a qualified wetland scientist (preferably someone who helped with the original plan) should be available on-site during the construction and working as an advisor to the contractors. If this on-site “advisor” decides a major change in site design is needed, consultation with the MBRT is necessary before authorizing the contractors to finish the work. Any deviation authorized should be highlighted in the as-built report. This report should be available to the MBRT within 30 to 60 days after construction is complete. The MBRT will need time to review the as-built site report before they conduct their field visit to inspect the construction work.

### ***7.3.2. Monitoring Performance Standards***

Monitoring wetland mitigation bank surrogate and outcome performance standards over time is necessary to adequately determine if the mitigation bank is operating successfully. A performance standard is a measure of a mitigation action usually contingent on meeting a specified threshold (e.g., 80% cover of native grasses or 80% survival of planted trees).

Surrogate Performance Standards. These are applied under the presumption that if their respective measurable thresholds are met, then they will help serve to support a number of wetland functions (e.g., wildlife habitat, flood retention, etc.). Surrogate performance standards are usually applied in groups and are thought to collectively contribute to the support of wetland functions. At this time, with rare exception, all success criteria applied by mitigation banks are surrogate performance standards. After the mitigation site construction and planting is completed, the MBRT will want to know if the mitigation bank site consistently meets the performance standards as agreed upon in the Mitigation Bank Instrument over the life of the monitoring period. The bank sponsor should carefully consider how they are going to meet their surrogate performance standards, and how they are going to demonstrate to the MBRT that they have met the performance standards.

Meeting Surrogate Performance Standards. This may require special considerations in order to be successful. For example, if your surrogate performance standard is 80 percent survival of planted trees and shrubs, the following considerations may apply.

- Planting during the proper time of year.
- Planting in the proper moisture regime (may require knowledge on species relationship

to soil drainage class, elevation/water regime, and geomorphic influences) for each species/genotype planted.

- Proper site preparation for planting.
- Weed control during the first several growing seasons.
- Irrigation during the first several growing seasons.
- Herbivory control.

Reference Sites. These are commonly used by a mitigation bank sponsor to help establish the surrogate performance standards for the mitigation bank. In other words, the conditions observed at the reference site(s) are used as surrogate performance standards to gauge the success of the mitigation bank. Largely depending on the seral stage targeted, there will be varying lag time periods between the dates of initial site work and the dates when the conditions at the mitigation bank sites are structurally and functionally indistinguishable from the conditions at the corresponding reference sites. In order to meet surrogate performance standards, and subsequently receive full credit for their mitigation bank actions, most mitigation bank sponsors will likely need to demonstrate that their bank sites have either already met reference site target conditions or that they are strongly trending towards that goal.

Monitoring Protocols and Consistent Reporting Formats. Monitoring protocols and consistent reporting formats for surrogate performance standards are now only loosely available to mitigation bank sponsors and their consultants. However, there are some common considerations that most MBRTs will be using during their respective evaluations of mitigation bank success. They should help serve as guidelines to mitigation bank sponsors and their consultants when designing and implementing mitigation bank monitoring strategies. Several key considerations are listed below.

- The same monitoring protocol should be used consistently (unless modified to eliminate a weakness) throughout each phase of the projects in question (planning (baseline), as-built (implementation), and over time (success monitoring)).
- The monitoring protocols should be the same for both the mitigation bank sites and the reference sites.
- Reporting formats should be consistent throughout each phase of the mitigation bank (unless modified to eliminate a weakness).
- To the degree practicable, the same people and/or firms starting the project monitoring should finish it.
- The person(s) responsible for the field work in a given monitoring report should be present during MBRT field evaluation of that monitoring report.

Attributes Used to Partition Surrogate Performance Standards. Several attributes such as flora and plant community, plant community physiognomy (structural emphasis), soils, and hydrology are used to generally partition surrogate performance standards. Each attribute is intimately connected to the landscape position and regional climate in which they interact.

However, each of these attributes can also be uniquely affected by one another at many different spatial and temporal scales.

Geomorphic Settings. These are essentially the landscape positions of the wetland mitigation banks and their corresponding reference sites (after a mitigation bank's site work is complete, it should be the same respective geomorphic class and subclass as its respective reference site). General examples of hydrogeomorphic classes include isolated depressions fed primarily by rainwater, depressions that are frequently inundated during over stream bank flooding, flats with horizontal ground water flow, and fringe wetlands with bi-directional water fluctuations (e.g., tides). From the geomorphic perspective, landscape position and water behavior (hydrology) are intimately connected. As such, geomorphic settings help provide a foundation for the characteristics and processes that give rise to wetland functions.

Soils. Soils are, in essence, a physical, chemical, and biological interface between the abiotic (non-living geologic, hydrologic, atmospheric, mineral, and dead organic) and the biotic (living microbial, plant, invertebrate, and vertebrate species) environments. Soil characteristics are, therefore, important to the fundamental functions of the terrestrial and aquatic environments and the areas where they interface. Soil monitoring is often done by excavating relatively large pits using a backhoe (five to six feet deep), digging one to three foot deep holes using a shovel, and/or withdrawing soil cores using augers. These "test pits" should be examined by qualified soils scientists and hydrologists who can interpret information about the on-site soil morphology and its relationship with the long-term hydrology. An understanding of a mitigation bank's soils is a critical prerequisite to establishing new or restoring historic wetland hydrology patterns to an area.

Hydrology. Hydrology (the dynamic behavior of groundwater and surface waters in an area) is a critical wetland attribute that fundamentally affects the other wetland attributes and subsequent wetland functions. The hydrology of an area heavily influences the establishment of plant species and their subsequent growth rates and potential. It forms discrete habitat elements (e.g., rivers, streams, lakes, ponds, water body associated wetlands, and isolated wetlands) each supporting unique assemblages of plant and animal species. An understanding of the existing and potential diurnal and/or seasonal hydrology of an area is critical to wetland planning and management decisions. Additional information on hydrology and hydrologic monitoring is found in Section 7.4 of this chapter.

Flora and Plant Community. This can be generally defined as the plant species present and the subsequent plant species associations that are distinguishable as discrete units (usually based on wetland class and/or plant community homogeneity). These units are often displayed on areal maps. This attribute is commonly documented and measured using plot and/or point intercept techniques along transect lines. Transect lines are usually randomly placed inside the

pre-stratified units. Then certain stand characteristics (e.g., stem height and/or diameter, stem density, species percent areal cover, etc.) are documented in each sample along the transect.

Plant Community Physiognomy. This phrase is used to refer to stand structure (the different combinations of tree, shrub, and herbaceous plant associations) or the overall structural appearance of a vegetation unit. This attribute is also distinguishable as a discrete unit that can be mapped (the larger the scale, generally the better the resolution of the unit). The unit boundaries are based on substantial differences in structural homogeneity. Monitoring protocols for plant community physiognomy are similar to those used to document flora and plant community.

Outcome Performance Standards. Outcome performance standards (also known as verification performance standards) are distinguished as measures of the actual function(s) being targeted by the mitigation bank sponsor. Functions are usually supported by a number of subordinate processes that generally require more detailed and more frequent monitoring strategies when compared to surrogate performance standards. This is why surrogates are usually preferred. However, there are some emerging wetland assessment tools that recognize a need to incorporate outcome performance standards into a verification or feedback phase of their assessment strategy. In other words, there appears to be a growing recognition that assessment models can only be substantively improved if their assumptions are periodically tested by actually measuring the functions the surrogate performance standards are designed to infer.

The actual use of habitats by fish and wildlife is an example of an outcome performance standard. As with other outcome performance standards, it has traditionally been left out of most wetland monitoring plans. However, there now appears to be an increasing awareness among wildlife managers and wetland scientists regarding the need to better document these habitat/species relationships. There are many opportunities to do this on mitigation and restoration monitoring projects. Documentation of fish and wildlife species using the habitats established in wetland mitigation banks can provide a feedback loop regarding whether those banks are supporting the species intended. As it stands now, species are often presumed to be using the mitigation banks if their respective habitats were targeted.

This feedback loop is relatively new and would likely have to be applied at a sub-watershed level in order to establish areas appropriate for the use of outcome performance standard inferences. Therefore, it is too soon to prescribe outcome performance standards for near future mitigation bank efforts. However, assuming that some specific sub-watershed level reference sites were monitored and were able to provide data over time on outcome performance standards, that could eventually change for those sub-watersheds. The reference site data would need to have been consistently accrued over a sufficient length of time and monitoring frequency to be useful. Theoretically, that data could then be used to prescribe

outcome performance standards for other sites similar to the reference sites in the specific sub-watersheds where the data were collected.

The data would likely be used to predict fish and wildlife presence, relative abundance, seasonality, and behavioral uses of habitats established after specific mitigation bank actions were complete. The predictions would be based on the fish and wildlife uses documented at the “regional reference site(s).” Then, through mitigation bank monitoring, these predictions could be tested and translated into the form of *outcome or verification* performance standards for fish and wildlife use of a given mitigation bank within the sub-watershed containing the regional reference site(s).

### **7.3.3. Contingency Plans**

Contingency plans are a primary safety net sometimes required when performance standards are not met. If the MBRT judges that the original performance standard(s) are reasonable and that the reason for failure is rooted in the implementation of the mitigation action by the bank sponsor, then it is likely the bank sponsor will be required to apply a contingency plan in order to remedy whatever is preventing a particular performance standard, or set of performance standards, from being met.

### **7.3.4. Adaptive Management**

Adaptive management is a secondary safety net. Past experience has demonstrated that even after careful planning and implementation, performance standards may still not be met. The MBRT members realize that mitigation banking and restoration actions are part science and part art. Under this philosophy each action is an experiment with a hypothesis on what the outcome will be but with an accompanying realization that there may be unanticipated results. The MBRT members generally realize that continued monitoring on a given project may reveal that initial performance standards were unreasonable and that they will have to be modified or abandoned. Likewise new ones may need to be developed to better reflect the current condition(s). They acknowledge that this may be an iterative process throughout the duration of a mitigation bank’s monitoring period. It is a learning process as long as we continue to strive for specific measurable performance standards. There also is a need to be able to continually evaluate the reasons why certain performance standards are either able or unable to be met. This is considered adaptive management.

## **7.4. HYDROLOGY**

The primary purpose of hydrologic monitoring at a mitigation bank site is to confirm that the site’s hydrology will support the appropriate wetland type. Also, because Oregon’s mitigation



banking rules require use of reference wetlands, the hydrologic monitoring is also used to relate the conditions at the mitigation bank site to those at the reference site.

Many wetlands experience some duration of ponded water at their surface as well as saturated soil conditions. In these cases, the monitoring needs to document the depth, periodicity, and duration of surface flooding. Techniques to document these conditions are discussed in the *Surface Water Monitoring* section. The monitoring also needs to document the saturated soil conditions including the periodicity, duration, and maximum depth to which the water table recedes. Techniques to document these conditions are discussed in the *Groundwater Monitoring* section.

Because these conditions are the driving forces that determine the type of wetland (wetland habitat) that is supported, it is necessary to document both the surface and groundwater conditions for each wetland habitat type included in the mitigation bank. Hydrologic monitoring also provides a basis for assessing the related function of a given wetland. For example, monitoring the frequency and duration of flooding provides some of the data needed for assessing the flood storage and water quality improvement functions.

The following sections propose techniques that will minimally document the surface and groundwater conditions at the mitigation bank site. Additional monitoring may be required when the bank site is exceptionally large or particularly complex, or when the uncertainty of successful restoration, enhancement, or creation may be of concern. Less monitoring may be acceptable where the hydrology can be predicted with reasonable certainty or at sites where the MBRT determines that monitoring of other characteristics such as vegetation and macroinvertebrates will provide sufficient information to verify that the required hydrology at the site has been achieved.

#### ***7.4.1. Surface Water Monitoring***

Freshwater wetlands may occur along streams and lakes where the water level in the wetland fluctuates as that in the stream or lake. If a nearby gage, such as a U.S. Geological Survey stream gaging station, provides water level data, it may be sufficient to document water level fluctuation in the wetlands. However, such gages are rarely available where needed so data must usually be collected at the project site.

Wetlands also occur in closed depressions isolated from streams or lakes, supported primarily by direct precipitation or overland runoff. They also are found on slopes above the typical flood plain of streams or lakes (likely supported by groundwater seepage); by definition these wetlands are rarely or never flooded so surface water monitoring is not required. A strategy for monitoring surface water conditions for wetlands along streams or lakes and those in closed depressions is presented below.

Wetlands Along Streams or Lakes. The depth of water in the wetland should be monitored at a location near the bank of the stream or edge of the lake. The water depth should be monitored at a frequency sufficient to document the periodicity and duration of flooding as it relates to the different wetland habitat types included in the mitigation bank site. Monthly observations may provide sufficient information for relatively simple wetlands (shallow marsh adjacent to a slowly fluctuating lake).

However, where the bank includes more than one habitat type and where water levels may fluctuate rapidly (marshes next to a stream), more frequent observations (weekly, daily, hourly) may be appropriate. However, before more frequent observations are proposed, a clear understanding of what questions the data will answer need to be discussed. Data are costly to obtain and analyze and should be required only where the success or function of the bank cannot be determined without the additional data.

Several techniques can be used to document the depth of ponding at the edge of the wetlands. A conventional technique is placing a gage (a plate or post) with graduations (inches, hundredths of a foot) at a convenient location next to the stream or lake and observing the water level on this staff gage at the required frequency. Ideally, the gage should be placed so that zero corresponds to the land surface and a reading of zero means that there is no surface water present. However, if that is not possible, the value on the gage that corresponds to the land surface should be identified as “gage datum” and noted prominently in the base information provided for the staff gage.

Another technique for documenting the depth of ponding is to measure down from a fixed observation point. Where a bridge, tree, post, or other permanent feature is conveniently located, a permanent mark may be made on the feature and each observation reported as a measurement down or up from the measuring point.

Where the scope of the project may warrant, water level gages may be used to measure the change in water surface levels and record water levels on a paper chart or electronically. These recorders may record water level fluctuations continuously (paper chart containing a continuous trace) or at a pre-determined frequency (hourly, daily). A detailed topographic survey (one-foot contours) is needed in order to relate water level observations at the monitoring site to depth and duration of ponding in specific wetland habitats.

Wetlands in Closed Depressions. A gage in the center or deepest part of a depression wetland could be used to observe water levels from highest to lowest. Ideally, the gage should be placed so that “zero” on the gage corresponds to the level at which the wetland just becomes dry. The water level should be observed at a frequency sufficient to document the depth and duration of ponding for each individual habitat associated with the wetlands. Monthly observations may be sufficient to describe the hydro-period for single wetland type (such as shallow or deep marsh receiving mostly precipitation). However, if several unique wetland

habitats occur, and particularly if the bottom is relatively flat (1 to 3 percent grade), observations should be obtained weekly or more frequently. If the wetland may be dry occasionally, an observation well might be installed to allow observations of the depth to water during such periods.

The hydrograph of water levels provides the data to describe the depth, frequency, and duration of ponded water for any wetland zone. The unmodified hydrograph documents the depth and duration of ponding in the center of the wetlands. If one or more distinct zones adjoin the ponded area, determine the elevation (relative to the gage) of the beginning/lowest part of each zone of interest, subtract that value from the gage record, and the resulting hydrograph describes the depth and duration of ponding for that zone.

#### **7.4.2. *Groundwater Monitoring***

Many wetlands occur on slopes or in depressions above or away from the influence of lake or stream level fluctuations and they are likely supported by groundwater. Even those wetlands associated with lakes or streams may be influenced by near-surface groundwater conditions. Documentation of the hydrology of the wetlands and individual wetland habitats requires information on groundwater levels.

Wetlands occur on a continuum from deepwater to upland and from one wetland type/class to another. Slope wetlands, in some rare instances, may be readily identified because they occur on hillsides far above the nearest lake or stream. More often, however, they may be merely the upper slope of riparian wetlands along lakes or streams, but high enough that they are never flooded by stream or lake level fluctuations. Strictly speaking, if the uppermost wetland zone around depression wetlands is above the highest water level ever occurring in the depression, it functions as slope wetlands. In slope wetlands, it is desirable to document groundwater conditions at both the upper and lower wetland limits. Typically the water level fluctuation will be greatest at the transition from wetland to upland (upper limit) and least at the lowest part of the wetlands or at the transition from wetland to deepwater habitat.

### **7.5. WATER QUALITY**

The quality of water in the targeted watershed or a wetland mitigation bank may be a primary objective of restoration, either to sustain or improve it to a desired condition. Establishing an appropriate flow regime and/or hydrogeomorphology of the bank site may do little to ensure a healthy ecosystem if the physical and chemical characteristics of the water are inappropriate. For example, a stream or watershed containing high concentrations of toxic materials or in which high water temperatures, low dissolved oxygen (DO), or other physical/chemical characteristics are inappropriate because they cannot maintain a healthy aquatic system. Also, poor condition of the surrounding watershed, such as poor erosion controls or excessive

sources of nutrients, contaminants, or wastes, can result in the degradation of the physical and chemical conditions.

A fundamental understanding of the chemistry of a given system is critical for developing appropriate data collection and analysis methods. Hundreds of chemical compounds can be used to describe water quality. It is typically too expensive and time consuming to analyze every possible chemical of interest in a given system. In addition to selecting a particular constituent to sample, the analytical techniques used also must be considered. Another consideration is the chemistry of the constituent. Whether the chemical is typically in the dissolved state or sorbed onto sediment makes a profound difference in the methods used for sampling and analysis, as well as the associated costs.

Often it is effective to use parameters that integrate or serve as indicators for a number of other variables.

For instance, DO and temperature measurements integrate the net impact of many physical and chemical processes on an aquatic system, while soluble reactive phosphorus concentration is often taken as a readily available indicator of the potential for growth of attached algae. The needed frequency of sampling depends on both the constituent of interest and management objectives. Field sampling and water quality analyses are time-consuming and expensive, and schedule and budget constraints often determine the frequency of data collection. Such constraints make it more important to design data collection efforts that maximize the value of the information obtained. Some of the parameters commonly considered for data collection and analysis are discussed in the following sections of this chapter.

The selection of sampling sites is the third critical part of a sampling design. Most samples represent a point in space and provide direct information only on what is happening at that point. A key objective of site selection is to choose a site that gives information that is representative of conditions throughout a particular water body.

### ***7.5.1. Sediment***

Although sediment and its transport occur naturally in any surrounding landscape, changes in sediment load and particle size can have negative impacts. Fine sediment can severely alter aquatic communities. Sediment may clog and abrade fish gills, suffocate eggs and aquatic insect larvae on the bottom, and fill in the pore space between bottom cobbles where fish lay eggs. Sediment also may carry other pollutants into water bodies. Nutrients and toxic chemicals may attach to sediment particles on land and ride the particles into surface waters where the pollutants may settle with the sediment or become soluble in the water column.

Rain erodes and washes soil particles off plowed fields, construction sites, logging sites, and urban areas into water bodies. Eroding streambanks also deposit sediment into water bodies.

In sum, sediment quality in a wetland or stream represents the net result of erosion processes within the watershed. Restoration efforts may be useful for controlling loads of sediment and sediment-associated pollutants from the watershed to aquatic areas. These may range from efforts to reduce upland erosion to treatments that reduce sediment delivery through the riparian zone or buffers.

### ***7.5.2. Water Temperature***

Within a watershed, the temperature of upstream water, processes within the watershed reach, and the temperature of influent water affect water temperature. Water that flows over the land surface has the opportunity to gain heat through contact with surfaces heated by the sun. In contrast, ground water is usually cooler in summer and tends to reflect average annual temperatures in the watershed. Both the fraction of runoff arriving via surface pathways and the temperature of surface runoff are strongly affected by the amount of impervious surfaces within a watershed. Water also is subject to thermal loading through direct effects of sunlight on streams and the contribution of reflective surfaces including riprap and concrete structures. Therefore, maintaining or restoring normal temperature ranges can be an important goal of restoration. The establishment of historic floodplain wetlands to their ancestral channels can aid in reestablishing cooler seasonal baseflows to impaired stream systems.

### ***7.5.3. Chemical Constituents***

Alkalinity, acidity, and buffering capacity (pH) are important characteristics of water that affect its suitability for biota and influence chemical reactions. Many biological processes, such as reproduction for aquatic organisms, cannot function in acidic or alkaline waters. Aquatic organisms may suffer an osmotic imbalance under sustained exposure to low pH waters. Rapid fluctuations in pH also can stress aquatic organisms. Acidic conditions can aggravate toxic contamination problems through increased solubility, leading to the release of toxic chemical stored in wetland or stream sediments. Restoration techniques that decrease plant growth through increased shading, reduce nutrient loads, or increase reaeration also tend to stabilize highly variable pH levels attributable to high rates of photosynthesis.

Pollutants that cause toxicity in animals or humans are of obvious concern to restoration efforts. Toxic organic chemicals are synthetic compounds that contain carbon, such as polychlorinated biphenyls (PCBs) and most pesticides and herbicides. Many of these compounds tend to persist and accumulate in the environment because they do not readily break down in natural ecosystems. Toxic organic chemicals may reach a water body via both point and nonpoint sources. Pollutants that tend to sorb strongly to soil particles are primarily transported with eroded sediment. Controlling sediment delivery from source area land uses is therefore an effective management strategy. Organic chemicals with significant solubility may be transported directly with the flow of water, particularly storm flow from impervious urban surfaces.

Unlike synthetic organic compounds, toxic metals are naturally occurring. In common with synthetic organics, metals may be loaded into water bodies from both point and nonpoint sources. Although many toxic metals are present at significant concentrations in most soils, they are in sorbed, non-bioavailable forms. Sediment often introduces significant concentrations of metals such as zinc into water bodies. Movement of metals from soil to watershed is largely a function of the erosion and delivery of sediment.

#### **7.5.4. Dissolved Oxygen**

Dissolved oxygen is not usually a water quality concern in wetlands. However, opportunities to restore or construct wetlands adjacent to riparian areas and stream segments can provide improvements to water quality parameters such as DO in the adjacent stream through a variety of physical, chemical, and biological processes.

Dissolved oxygen is a basic need for any healthy aquatic ecosystem. Most fish and aquatic insects “breathe” oxygen dissolved in the water column. Although some fish and aquatic organisms are adapted to low oxygen conditions, most sport fish species such as salmon and trout suffer if DO levels fall below 3 to 4 milligrams per liter. Larvae and juvenile stages are even more sensitive and require higher DO levels. Water absorbs oxygen directly from the atmosphere and from plants as a result of photosynthesis. The ability of water to hold oxygen is influenced by temperature and salinity. Water loses oxygen primarily by respiration of aquatic plants, animals, and microorganisms.

Although DO concentrations in the water column fluctuate under natural conditions, it can be severely depleted as a result of human activities that introduce large quantities of biodegradable organic materials. Intercepting stream flows through an adjacent wetland area can filter and recycle many of these organic materials. In general, oxygen transfer in natural waters depends on the following factors.

- internal mixing and turbulence due to velocity gradients and fluctuation
- temperature
- wind mixing
- waterfalls, dams, and rapids
- surface films
- water column depth

Wetland and riparian restoration techniques can take advantage of these factors to increase oxygenation into receiving stream waters. Wetland designs can utilize physical processes, such as installing artificial cascades to increase reaeration. Other design considerations can take advantage of biological processes to improve the water column. Increased water surface area for gas exchange in a wetland improves DO content for decomposition of organic compounds

and oxidation of metallic compounds. In addition, oxygen is produced within aquatic systems by aquatic plants as they conduct atmospheric gases (including oxygen) down into their roots. Some wetland species are better adapted than others in transporting oxygen through their root systems. Wetland vegetation substantially increases the amount of aerobic environment available for microbial populations, both above and below the surface. Wetland vegetation planted in a restoration area can be selected specifically for these attributes. With proper design, a wetland connected to an adjacent stream system can provide additional benefits to DO levels within the stream water column.

## CHAPTER 8: GLOSSARY

**Bank Sponsor.** The bank sponsor is any public or private entity responsible for establishing and, in most circumstances, operating a mitigation bank. The sponsor assumes all legal responsibilities for carrying out the terms of the Mitigation Bank Instrument unless specified otherwise explicitly in the Bank Instrument.

**Baseline Conditions.** The ecological conditions, wetland and/or habitat functions and values, and the vegetative, soils, and hydrologic characteristics present at a site prior to creating a mitigation bank.

**Best Management Practice (BMP).** A physical, structural, and/or managerial practice that, when used singly or in combination, prevents or reduces pollutant discharges.

**Buffer.** An upland area immediately adjacent to, surrounding, or within a wetland that improves or maintains the functioning of that wetland.

**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 which remain after all appropriate and practicable avoidance and minimization has been achieved.

**Constructed Wetland.** A facility exhibiting wetland characteristics that was constructed for the purpose of performing a utility need, such as a sedimentation pond. It is not eligible for mitigation credit or subject to the jurisdictional requirements of federal and state wetland law.

**Credit.** A unit of measure representing the accrual or attainment of aquatic functions at a mitigation bank; the measure of function is typically indexed to the number of wetland acres restored, created, enhanced, or preserved. A “certified credit” results when the bank has met or exceeded the performance standards established in the Bank Instrument. Once credits are certified, they are available for sale or exchange.

**Debit.** A unit of measure representing the loss of aquatic functions at a impact or project site.

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

**Financial Assurance(s).** The money or other form of financial instrument (for example, surety bonds, trust funds, escrow accounts, proof of stable revenue sources for public agencies) required of the sponsor to ensure that the functions of the subject mitigation bank are achieved



and maintained over the long-term pursuant to the terms and conditions of the Mitigation Bank Instrument.

**Functional Assessment.** This is the ecological assessment of the degree to which a wetland is performing, or is capable of performing, specific wetland functions.

**Mitigation.** Mitigation means sequentially avoiding impacts, minimizing impacts, and compensating for remaining unavoidable impacts.

**Mitigation Bank.** A mitigation bank is a site where wetlands and/or other aquatic resources are restored, created, enhanced, or in exceptional circumstances, preserved expressly for the purpose for providing compensatory mitigation in advance of authorized impacts to similar resources. For purposes of Section 10/404, use of a mitigation bank may only be authorized when impacts are unavoidable. Under Oregon law, banks can only be used to provide compensatory wetland mitigation for anticipated losses in wetland function(s) and value(s) when on-site mitigation is not practicable or when off-site mitigation is environmentally preferable.

**Mitigation Bank Instrument.** The final document approved by the Corps of Engineers and the Division of State Lands that details the terms and conditions of construction, operation, and long-term management of the bank. The Bank Instrument is usually in the form of a Memorandum of Agreement and is signed by the Corps of Engineers, the Division of State Lands, and the sponsor as well as members of the Mitigation Bank Review Team. However, an order from the Division of State Lands makes the Bank Instrument legally binding and enforceable if a removal-fill permit is not required to construct the bank.

**Mitigation Bank Review Team (MBRT).** An interagency group of federal, state, tribal and/or local regulatory and resource agency representatives which are signatory to a bank Memorandum of Agreement and advise the Corps of Engineers and Division of State Lands on the establishment, use, and operation of a mitigation bank.

**Practicable.** Available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

**Preservation.** This is 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.

**Prospectus.** This is the preliminary document prepared by a mitigation bank sponsor describing a proposed bank in detail sufficient to enable initial review by the Corps of Engineers and the Division of State Lands. It is used to initially determine whether the proposed bank

would be technically feasible, whether the bank is likely to be needed, and whether the bank can meet the policies stated in the federal interagency guidelines and the Oregon Administrative Rules.

***Reference Site.*** A site(s) that have the same characteristics as those proposed for compensatory mitigation. Reference sites are typically wetlands that exemplify the goals of the mitigation effort.

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

***Service Area.*** The designated area wherein a mitigation bank can reasonably be expected to provide appropriate compensation for impacts to wetlands and/or other aquatic resources.

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## APPENDIX A – CASE STUDIES

### Oak Creek Mitigation Bank Lebanon, Oregon

**Sponsor:** Oak Creek Mitigation Bank LLC

**Type:** Private, for-profit, credits available to any permit applicant, public or private, who qualifies.

**Status:** Active.

**Purpose:** The mitigation bank is being created to sell credits to those holding a valid permit from the Oregon Division of State Lands (DSL) and the U.S. Army Corps of Engineers (Corps) allowing off-site mitigation for unavoidable wetland impacts within the bank's service area.

**Size and Location:** The total bank area is approximately 88.2 acres (parcel 800, T12S, R2W, Sec. 26), immediately south of Lebanon's Urban Growth Boundary and north of Rock Hill Road (County Road 739).

**Service Area:** The service area includes the mid-Willamette River watershed within Linn and Benton Counties, including Oak Creek and the Calapooia River up to the community of Holly. This includes the communities of Lebanon, Sweet Home, Albany, Corvallis, and Philomath.

**Enabling Instrument:** The Memorandum of Agreement constitutes a contract between the sponsor, the DSL, and the Corps to allow the sponsor to construct a private mitigation bank. The Instrument is the detailed operations manual of the bank.

**Mitigation Bank Overview:** The sponsor will restore, create, and enhance wetland resources and reconnect Oak Creek with its historic flood plain at a site of approximately 88.2 acres at the south side of Lebanon that has been actively farmed for more than 50 years. The project design restores the former riparian, depression, and slope wetland classes (emergent, scrub-shrub, and forested wetland habitats) and subsequently, the wetland characteristics and functions to the site. The sponsor will monitor vegetation, wildlife usage, and hydrology for a period of five years after the last credit is sold, or until released from this obligation by the DSL and Corps.

It is anticipated that approximately 61 acres of wetland will be restored with approximately 5 acres of buffer. The total number of credits available for assignment/sale to permit holders will depend on the credits the DSL and Corps allows for each of these categories; but will likely be approximately 30-acre credits. A percentage of the total credits will be available for sale upon completion of construction and the remaining credits will be released for sale when the DSL and Corps certify the credits.

**Ecological Goals and Objectives of the Bank:** There is significant potential to restore function at the bank site, including flood storage, water quality, wildlife habitat, fish habitat, resilience against future insults, education, recreation, and aesthetics. At present the site is farmed and except for the forested wetland, the remainder of the site exhibits little wetland characteristics and significantly reduced function.

Prior to Euro American settlement, vegetation communities on the site likely consisted of riparian forest dominated by Oregon ash and black cottonwood and wet prairie dominated by tufted hairgrass and other herbaceous species. Intermediate communities that reflected the limits of human-set fires, saturated areas, or deeper ponding may have included scrub-scrub communities at the edge of the forest, sedge communities where saturation persisted, and marsh communities where ponding persisted throughout the growing season. Though some topographic features may have been eliminated by agricultural activities, the site probably supported a mosaic of wet and mesic prairie, primarily along Oak Creek, and a riparian overstory along the creek, which occupied multiple channels within a wider floodplain than at present. Under these historic conditions, Oak Creek periodically flooded over the very shallow river valley and the rest of the site was seasonally ponded and saturated to the surface well into the growing season, reflecting near-surface groundwater levels.

The goal is to restore the vegetation communities to those characterized by surveys of reference sites and to restore the hydrology to as close to historic conditions as is possible. The hydrologic design will undo, to the extent possible, the confinement of Oak Creek to its deepened channel that has separated the stream from its associated riparian habitat and flood plain. In so doing, the hydrology of the site will be restored and the wetland habitats that will be supported will be nearer to those that historically occupied the site. Further, by working with existing site hydrology, no subsequent hydrologic maintenance will be required.

The planting strategies are designed to most rapidly re-establish the desired plant communities in each habitat. Native trees and shrubs appropriate to restore the riparian forest community will be planted along both sides of Oak Creek. The wet meadow communities will require a combination of natural recruitment and weed management. Since both desirable and undesirable species are likely to be present in the seed bank, hydrologic restoration and soil disturbance will determine what initially colonizes the disturbed areas. However, recognizing that volunteer recruitment is most desirable and volunteer plant communities most likely to persist, planting strategies will capitalize on natural recruitment to the extent possible.

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**Mud Slough Mitigation Bank  
Rickreall, Oregon**

**Sponsor:** Mark and Debora Knaupp

**Type:** Private, for-profit, credits available to any permit applicant, public or private, who qualifies.

**Status:** Near approval.

**Size and Location:** The bank contains 56.25 acres as a portion of a 1,100-acre farm (tax lot 100, T7S, R4W, Sec. 17) in Yamhill County. The address is 1875 N. Greenwood Road, which is 0.5-mile north of Highway 22 and 4 miles west of Salem.

**Service Area:** A portion of the Middle Willamette drainage basin including Salem, Dallas, Monmouth, and Independence.

**Enabling Instrument:** A Memorandum of Agreement between the sponsor, the Oregon Division of State Lands, and the U.S. Army Corps of Engineers for construction and operation of a private mitigation bank.

**Mitigation Bank Overview:** The site is currently in agricultural use for tall fescue grass seed production. Also, 320 acres of restored wetlands are owned and managed by the bank sponsors in the National Wetland Reserve Program (WRP) administered by the Natural Resources Conservation Service (NRCS), Oregon Department of Fish and Wildlife, and Ducks Unlimited. The proposed mitigation bank has all of the key attributes for success: a willing landowner; proper site conditions that allow a wetland to be enhanced, restored, or created; the need for mitigation within the service area; a cohesiveness with adjoining and nearby natural areas; and few, if any, negative impacts to adjacent properties.

The location of this bank is nearly ideal. One on-site and several areas adjoining the bank are classified as jurisdictional wetland on the National Wetlands Inventory map. The bank's soil is Bashaw clay. The entire site has received a determination by the NRCS of farmed wetland. As farmland, it is poor due to the high water table. As wetland, it is currently also poor due to the agricultural manipulations that have occurred including drainage ditches and the monoculture of cultivated tall fescue. All 56.25 acres of the bank will be enhanced in much the same manner that has proven successful on the adjacent 320 acres. Natural high groundwater levels surround the area, which assure that wetland hydrology will be fairly easy to enhance on the site through building low, wide dikes. Also, the bank is located within close proximity to Salem, Dallas, Monmouth and Independence.

The long term ecological goals of the bank are to restore wetlands as close as possible to near historical levels of quantity, quality and diversity; to restore the highest quality and diversity of habitat for the indigenous wildlife of the area; to work toward controlling the levels of non

native/invasive vegetation to levels of the surrounding wetlands; and to maintain these levels for the long term.

The long term social and economic goals of the bank are to provide a model of wetland restoration that will allow the public to visualize the importance of restoring and maintaining wetland resources, as well as the economic incentives that are available for natural resources restoration.

The landowners' long term goal for the site is well underway with the current enhancement and restoration of the 320-acre WRP project. The addition of the 56.25-acre bank will create an even larger contiguous wetland that will provide an extremely high quality wetland with superb wildlife habitat and additional floodwater storage for the Rickreall watershed.

Each of the conditions in the Mitigation Banking Instrument will terminate five years after the last credit of the bank is sold, except for the restrictive covenant that is perpetual in nature. Additionally, each condition of the Instrument will be carried out barring catastrophic acts of nature, such as, but not limited to, earthquakes, drought, volcanic activity, etc., which could prevent meeting the performance standards.

**Contact for Further Information:**

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**Caledonia Marsh Mitigation Bank at the Running Y Ranch Resort  
Klamath Falls, Oregon**

**Sponsor:** Eagle Crest, Inc., a wholly owned subsidiary of Jeld-Wen, Inc., an Oregon Corporation with headquarters in Klamath Falls.

**Type:** Private, for-profit, credits available to any permit applicant, public or private, who qualifies.

**Status:** Near approval.

**Size and Location:** The bank contains 326 acres as part of the 3,500-acre resort property. The Caledonia Marsh is located on the north end of the Running Y Ranch, which is situated on the west side of Upper Klamath Lake off Highway 140, north west of the City of Klamath Falls.

**Service Area:** Roughly the southern half of the entire Klamath Basin in Oregon, north of the California border.

**Enabling Instrument:** A Memorandum of Agreement between the sponsor, the Oregon Division of State Lands (DSL), and the U.S. Army Corps of Engineers for construction and operation of a private mitigation bank.

**Mitigation Bank Overview:** The site is currently (and historically) in agricultural use for row crops such as barley, onion, beets, and potatoes. It is a portion of the nearly 1,500-acre Caledonia Marsh. The marsh has been maintained in a drier, farmable condition by perimeter diking and pumping of the inflowing lake and upland runoff water. Because the entire marsh is drained, former wetland, the resulting mitigation is considered restoration by DSL's rules, which means that one restored acre yields one credit. Therefore, this bank has the potential to mitigate for 326 acres of wetland loss over the long term.

The high potential for ecological success is clearly demonstrated by restoration efforts on immediately adjacent parcels, where re-hydration of drained areas has yielded positive results for wetland vegetation and waterfowl within one growing season. The need for the bank was well demonstrated by an assessment of historical and projected economic development and population growth projections for Klamath County.

The broad ecological goals of the bank are to create wetland waterfowl breeding and nesting habitat; increase the biological diversity of the region; improve water quality of surface waters by eliminating agricultural discharges from the new marsh area, and to provide educational opportunities to those who come to visit the ranch.

On the regulatory level, the goal of the bank is to effectively replace the functions expected to be lost when fill or removal permits are issued for wetland impacts within the service area. Specific

performance standards to measure achievement of these goals and objectives will be developed before the Mitigation Banking Instrument is finalized and approved.

The bank will be protected in the long term by establishment of a deed restriction. The deed restriction will allow only uses or activities on the site that are compatible with the broad goals of the mitigation bank.

Credits will be sold at market price, that is, what the market will bear. These credits become available when the regulatory agencies, with input from the Mitigation Bank Review Team, certify them as available for sale.

The Memorandum of Agreement for this bank terminates five years after the bank sells the last remaining whole or partial credit.

**Contact for Further Information:**

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**Fernhill Wetland Mitigation Bank  
Forest Grove, Oregon**

**Sponsor:** Unified Sewerage Agency (USA) of Washington County

**Status:** Near approval.

**Size and Location:** The bank contains 362 acres near the confluence of Gales Creek with the Tualatin River, approximately one mile south of Forest Grove in Washington County.

**Service Area:** The Tualatin River Basin below 500 feet mean sea level.

**Enabling Instrument:** A Memorandum of Agreement between the sponsor, the Oregon Division of State Lands, and the U.S. Army Corps of Engineers for construction and operation of a mitigation bank.

**Mitigation Bank Overview:** The USA is developing this bank to address its future wetland mitigation needs as well as those of the Joint Water Commission of Washington County, including the Tualatin Valley Water District, and the cities of Beaverton, Forest Grove, and Hillsboro. Since all of these entities have infrastructure projects that will impact wetlands, the bank is greatly needed. The bank also will be available for use by private individuals and companies.

The site is currently in agricultural use by farmers who have leased the land from USA. The land has been farmed since the early 20<sup>th</sup> century. Agricultural uses include dairy farming, pasture, truck farming, and grain, nut and small fruit production. The land was extensively drain-tiled with over 53,000 linear feet of tiling and three miles of dike to limit winter flooding from the Tualatin River and Gales Creek.

Construction of the bank involves removal of drain tile, some dike breaching, some minor re-contouring, and the planting of native trees, shrubs, and herbs. The bank is planned for phased development. Phase I covers 30 acres and was constructed in the summer of 2000. Future phases to be undertaken will add to the existing bank as the demand for credits arises.

The ecological goals of this riverine mitigation bank include providing appropriate and adequate compensatory mitigation for permitted impacts to projects within the banks' service area; emphasizing natural hydrology while maintaining flexibility in water management; protecting and enhancing wildlife habitat; providing additional floodplain storage; and improving water quality.

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## APPENDIX B – BIBLIOGRAPHY

- Altman, B. 1995. *Neotropical Migratory Land Birds in Oregon and Washington: An Overview of the Development of Monitoring Programs*. Report to Bureau of Land Management and Oregon-Washington Chapter of Partners in Flight. 48p.
- Barker R.J. and J.R. Sauer. 1995. *Statistical Aspects of Point Count Sampling*. In: Ralph, J.C., J.R. Sauer and S. Droege, editors. *Monitoring Bird Populations by Point Counts*. Technical Report PSW-GTR-149. Pacific Southwest Research Station, Forest Service. 187p.
- Bart, J. and D.S. Robson. 1995. *Design of a Monitoring Program for Northern Spotted Owls*. In: Ralph J.C., J.R. Sauer and S. Droege, editors. *Monitoring Bird Populations by Point Counts*. Technical Report PSW-GTR-149. Pacific Southwest Research Station, Forest Service. 187p.
- Brinson, M.M. 1993. *A Hydrogeomorphic Classification for Wetlands*. Wetland Research Program, Technical Report WRP-DE-4. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.
- Brinson, M.M., F.R. Hauer, L.C. Lee, W.L. Nutter, R.D. Smith and D. Whigham. 1995. *Guidebook for Application of Hydrogeomorphic Assessments to Riverine Wetlands (Operational Draft)*. Technical Report WRP-DE-11. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.
- Brooks, R.P. and R.M. Hughes. 1988. *Guidelines for Assessing the Biotic Communities of Freshwater Wetlands*. In: Kusler, J.A., M.L. Quanimen and G. Brooks, editors. *Proceedings of the National Wetlands Symposium: Mitigation of Impacts and Losses*. ASWM Technical Report 3. Association of State Wetland Managers, Inc., Beme, New York. p. 276-282.
- Bruce, C., D. Edwards, K. Mellen, A. McMillan, T. Owens and H. Sturgis. 1985. *Wildlife Relationships to Plant Communities and Stand Conditions*. In: Brown, E.R, technical editor. *Management of Wildlife and Fish Habitats in Forests of Western Oregon and Washington, Part 1*. Forest Service, PNW-8. p. 33-55.
- Buskirk, W.H. and J.L. McDonald. 1995. *Comparison of Point Count Sampling Regimes for Monitoring Forest Birds*. In: Ralph, J.C., J.R. Sauer and S. Droege, editors. *Monitoring Bird Populations by Point Counts*. General Technical Report, PSW-GTR-149. Pacific Southwest Research Station, Forest Service. 187p.

- Canfield, R. 1941. *Application of the Line Interception Method in Sampling Range Vegetation*. Journal of Forestry 39:388-394.
- Christy, J. 1993. *Classification and Catalog of Native Wetland Plant Communities in Oregon*. Oregon Natural Heritage Program, Portland.
- Clairain, E.J., Jr., editor. In preparation. *Guidelines for Developing Hydrogeomorphic Approach Regional Guidebooks*. Technical Report. U.S. Army Waterways Experiment Station, Vicksburg, Mississippi.
- City of Eugene. 1996. *West Eugene Wetland Mitigation Bank, Annual Report*. Public Works Department, City of Eugene, Oregon.
- Cowardin, L.M., V. Carter, F. Golet and E. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. Biological Services Program, U.S. Fish and Wildlife Service, Washington, D.C. 103p.
- Daubenmir, R. 1959. *A Canopy-coverage Method of Vegetational Analysis*. Northwest Science 3:43-64.
- Davis, M.M., E.J. Clairain, Jr, W. Ainslie, M. Gilbert, M.A. Schwinn, M. Sheehan, G. Sparks, K. Trott and M. Whited. May 1996 (draft). *Development of Regional Wetland Subclass HGM Functional Assessment Model*.
- Dawson, D.K., D.R. Smith, and C.S. Robbins. Date unknown. *Point Count Length and Detection of Forest Neotropical Migrant Birds*.
- DeSante D.F. and K.M. Burton. 1993. *Maps Manual: Instructions for the Establishment and Operation of Stations as Part of the Monitoring Avian Productivity and Survivorship Program*. The Institute for Bird Populations, Point Reyes Station, California.
- Dunn, E.H. and D. Hussell. 1995. *Using Migration Counts to Monitor Land Bird Populations: Review and Evaluation of Current Status*. Current Ornithology, Vol. 12, edited by D.M. Power. Plenum Press, New York.
- Follansbee, B. and R. Lawrence. 1986. *Transplantation of Eelgrass (Zostera marina) in Humboldt Bay*. Unpublished report. Pt. Richmond, California.
- Freemark, K. and C. Rogers. 1995. *Modification of Point Counts for Surveying Cropland Birds*. In: Ralph, J.C., J.R. Sauer and S. Droege, editors. *Monitoring Bird Populations*

by *Point Counts*. Technical Report PSW-GTR-149. Pacific Southwest Research Station, Forest Service. 187p.

- Gates, E.J. 1995. *Point Count Modifications and Breeding Bird Abundance in Central Appalachian Forests*. In: Ralph, J.C., J.R. Sauer and S. Droege, editors. *Monitoring Bird Populations by Point Counts*. Technical Report PSW-GTR-149. Pacific Southwest Research Station, Forest Service. 187p.
- Good, J.W. and C.B. Sawyer. 1997. *Recommendations for a Nonregulatory Wetland Restoration Program for Oregon: Final Report*. Prepared for Oregon Division of State Lands and U.S. Environmental Protection Agency, Oregon Sea Grant, Marine Resource Management Program, Oregon State University, Corvallis.
- Homer, R. R. and K.J. Raedeke. 1989. *Guide for Wetland Mitigation Project Monitoring*. Monitoring Guide Operational Draft, WA-RD 195.1. Washington State Department of Transportation, Olympia. 265p.
- Howe, R.W., A.T. Wolf, and T. Rinaldi. 1995. *Monitoring Birds in a Regional Landscape: Lessons from the Nicolet National Forest Bird Survey*. In: Ralph, J.C., J.R. Sauer, and S. Droege, editors. *Monitoring Bird Populations by Point Counts*. Technical Report PSW-GTR-149. Pacific Southwest Research Station, Forest Service. 187p.
- Huff, M.H., R. Sallabanks, and M. Johnson. 1997. *A Regional Vegetation Protocol for Bird Point Count Monitoring Stations in Washington and Oregon: Level 2 Quantitative Site Characterization and Vegetation Sampling, Basic and Advanced*. Adapted from Johnson, M.D. 1997. *Region 6 Inventory and Monitoring System: Field Procedures Manual for the Current Vegetation Survey*. Version 2.0, on file at Forest Service, Pacific Northwest Region, Portland, Oregon.
- Huff, M.H., R. Sallabanks, and M. Johnson. 1997. *A Regional Vegetation Protocol for Bird Point Count Monitoring Stations in Washington and Oregon: Level 3 Intensive Vegetation Sampling*. Adapted from Johnson, M.D. 1997. *Region 6 Inventory and Monitoring System: Field Procedures Manual for the Current Vegetation Survey*. Version 2.0, on file at Forest Service, Pacific Northwest Region, Portland, Oregon.
- Huff, M.H., R. Sallabanks, and M. Johnson. 1997. *A Regional Vegetation Protocol for Bird Point Count Monitoring Stations in Washington and Oregon: Appendices (partial)*. Adapted from Johnson, M.D. 1997. *Region 6 Inventory and Monitoring System: Field Procedures Manual for the Current Vegetation Survey*. Version 2.0, on file at Forest Service, Pacific Northwest Region, Portland, Oregon.

- Hussell, J.T. and C.J. Ralph. Date unknown. *Draft Recommended Methods for Monitoring Bird Populations by Counting and Capture of Migrants*. Intensive Sites Technical Committee, Migration Monitoring Council, Ontario Ministry of Natural Resources, Ontario, Canada.
- Hutto R.L., S.J. Hejl, J.F. Kelly, and S.M. Pletschet. 1995. *A Comparison of Bird Detection Rates Derived from On-road vs. Off-road Point Counts in Northern Montana*. In: Ralph, J.C., J.R. Sauer and S. Droege, editors. *Monitoring Bird Populations by Point Counts*. Technical Report PSW-GTR-149. Pacific Southwest Research Station, Forest Service. 187p.
- Jackson, P.L. 1989. *Field Analysis of Estuarine Restoration at the Astoria Airport Mitigation Bank*. Oregon Division of State Lands, Salem.
- Johnson, D.H. 1995. *Point Counts of Birds: What are We Estimating?* In: Ralph, J.C., J.R. Sauer and S. Droege, editors. *Monitoring Bird Populations by Point Counts*. Technical Report PSW-GTR-149. Pacific Southwest Research Station, Forest Service. 187p.
- Kagan, J.S. 1996. *Natural (Presettlement) Vegetation Classification*. Oregon Natural Heritage Program, Portland.
- Kagan, J.S., J.C. Hak, B. Csuti, C.W. Kiilsgaard and E.P. Gaines. 1999. *Oregon Gap Analysis Project Final Report: A Geographic Approach to Planning for Biological Diversity*. Oregon Natural Heritage Program, Portland.
- Keller, C. and M.R. Fuller. 1995. *Comparison of Birds Detected from Roadside and Off-road Counts in the Shenandoah National Park*. In: Ralph, J.C., J.R. Sauer and S. Droege, editors. *Monitoring Bird Populations by Point Counts*. Technical Report PSW-GTR-149. Pacific Southwest Research Station, Forest Service. 187p.
- Kiilsgaard, C.W. 1999. *Manual and Land Cover Type Descriptions. Oregon Gap Analysis 1998 Land Cover for Oregon*. Oregon Natural Heritage Program, Portland.
- Kuchler, A.W. 1966. *Analyzing the Physiognomy and Structure of Vegetation*. Ann. Association of American Geographers 56:112-126.
- Larson, J.S. 1976. *Models for Assessment of Freshwater Wetlands*. Publication No. 32. Water Resource Research Center, University of Massachusetts. 86p.



- Long Point Bird Observatory. 1996. *Marsh Monitoring Program: Training Kit and Instructions for Surveying Marsh Birds, Amphibians and Their Habitats*. Port Rowan, Ontario. 40p.
- Lynch, J.F. 1995. *Effects of Point Count Duration, Time-of-day, and Aural Stimuli on Detectibility of Migratory and Resident Bird Species in Quintana Roo, Mexico*. In: Ralph, J.C., J.R. Sauer, and S. Droege, editors. *Monitoring Bird Populations by Point Counts*. Technical Report PSW-GTR-149. Pacific Southwest Research Station, Forest Service. 187p.
- Marshall, J.L. 1985. *Value Assessment of Jackson-Frazier Wetland, Benton County, Oregon: A Case Study* [thesis]. Department of Geography, Oregon State University.
- Marshall, J.L. 1985. *Numeric Habitat Classification of Wells Islands, Hood River County, Oregon*. Unpublished report. Oregon Department of Fish and Wildlife, The Dalles.
- Marshall, J.L. 1993. *Application of Links Wildlife Habitat Importance Index Classification and Assessment at the Astoria Airport Mitigation Bank*. Draft report to the Oregon Division of State Lands, Salem.
- Martin, T.E. and G.R. Geupel. 1993. *Nest-monitoring Plots: Methods for Locating Nests and Monitoring Success*. *Journal of Field Ornithology* 64(4):507-519.
- Montana Cooperative Wildlife Research Unit. 1994. *Bird Field Protocol: Breeding Biology Research and Monitoring Database (revised)*. University of Montana, Missoula.
- National Research Council. 1992. *Restoration of Aquatic Ecosystems: Science, Technology, and Public Policy*. National Academy Press, Washington, D.C.
- Olson, D.H., W.P. Leonard and R.B. Bury. 1997. *Sampling Amphibians in Lentic Habitats: Methods and Approaches for the Pacific Northwest*. N.W. Fauna Number 4, Society for Northwestern Vertebrate Biology, Olympia, Washington.
- Oregon Division of State Lands. 1993. *Astoria Airport Mitigation Bank Background Report*. Unpublished report. Oregon Division of State Lands, Salem.
- Oregon Division of State Lands. 1993. *Application of Links Wildlife Habitat Importance Index Classification and Assessment at the Astoria Airport Mitigation Bank*. Unpublished report. Oregon Division of State Lands, Salem.
- Oregon Natural Heritage Program. March 1998. *Rare, Threatened, and Endangered Plants and Animals of Oregon*. Oregon Natural Heritage Program, Portland.

- Pendleton, G.W. 1995. *Effects of Sampling Strategy, Detection Probability, and Independence of Counts on the Use of Point Counts*. In: Ralph, J.C., J.R. Sauer and S. Droege, editors. *Monitoring Bird Populations by Point Counts*. Technical Report PSW-GTR-149. Pacific Southwest Research Station, Forest Service. 187p.
- Petit, D.R., L.J. Petit, V.A. Saab and T.E. Martin. 1995. *Fixed-radius Point Counts in Forests: Factors Influencing Effectiveness and Efficiency*. In: Ralph, J.C., J.R. Sauer and S. Droege. *Monitoring Bird Populations by Point Counts*. Technical Report PSW-GTR-149. Pacific Southwest Research Station, Forest Service. 187p.
- Ralph, J.C., J.R. Sauer and S. Droege. 1995. *Monitoring Bird Populations Using Point Counts: Standards and Applications*. In: Ralph, J.C., J.R. Sauer and S. Droege, editors. *Monitoring Bird Populations by Point Counts*. Technical Report PSW-GTR-149. Pacific Southwest Research Station, Forest Service. 187p.
- Reed, P.B. 1988. *National List of Plant Species that Occur in Wetlands: Northwest (Region 9)*. U.S. Fish and Wildlife Service, St. Petersburg, Florida. 8p.
- Rotenberry, J.T. and S.T. Knick. 1995. *Evaluation of Bias in Roadside Point Count Surveys of Passerines in Shrub-steppe and Grassland Habitats in Southwestern Idaho*. In: Ralph, J.C., J.R. Sauer and S. Droege, editors. *Monitoring Bird Populations by Point Counts*. Technical Report PSW-GTR-149. Pacific Southwest Research Station, Forest Service. 187p.
- Sauer, J.R., Pendleton, G.W. and S. Orsillo. 1995. *Mapping of Bird Distributions from Point Count Surveys*. In: Ralph, J.C., J.R. Sauer and S. Droege, editors. *Monitoring Bird Populations by Point Counts*. Technical Report PSW-GTR-149. Pacific Southwest Research Station, Forest Service. 187p.
- Savage, M.S. and A. Rust. 1993. *WSDOT Wetland Mitigation Sites 1992 Monitoring Report*. Washington State Department of Transportation, Olympia.
- Savard, J.P.L. and T.D. Hooper. 1995. *Influence of Survey Length and Radius Size on Grassland Bird Surveys by Point Count at Williams Lake, British Columbia*. In: Ralph, J.C., J.R. Sauer and S. Droege, editors. *Monitoring Bird Populations by Point Counts*. Technical Report PSW-GTR-149. Pacific Southwest Research Station, Forest Service. 187p.
- Simenstad, C.A., C.D. Tanner, R.M. Thom and L.L. Conquest. 1991. *Estuarine Habitat Assessment Protocol, Puget Sound Estuary Program*. U.S. Environmental Protection Agency, Region 10, Office of Puget Sound, Seattle, Washington.

- Smith, R.D. 1993. *A Conceptual Framework for Assessing the Functions of Wetlands*. Wetland Research Program Technical Report WRP-DE-3. Waterways Experiment Station, Vicksburg, Mississippi.
- Smith, R.D., A. Ammann, C. Bartoldus and M.M. Brinson. 1995. *An Approach for Assessing Wetland Functions Using Hydrogeomorphic Classification, Reference Wetlands, and Functional Indices*. Technical Report WRP-DE-9. Waterways Experiment Station, Vicksburg, Mississippi.
- Smith, W.P., D.J. Twedt, R.J. Cooper, D.A. Wiedenfeld, P.B. Hamel, and J.L. McDonald. 1995. *Sample Size and Allocation of Effort in Point Count Sampling of Birds in Bottomland Hardwood Forests*. In: Ralph, J.C., J.R. Sauer and S. Droege, editors. *Monitoring Bird Populations by Point Counts*. Technical Report PSW-GTR-149. Pacific Southwest Research Station, Forest Service. 187p.
- Swanson, G.A. 1978. *A Water Column Sampler for Invertebrates in Shallow Wetlands*. *Journal of Wildlife Management* 42:670-672.
- Temple, S.A. and J.R. Cary. Date unknown. *Using Checklist Records to Reveal Trends in Bird Populations*. Biological Report 90(1). Department of Wildlife Ecology, Madison, Wisconsin.
- Thompson, F.R. and M.J. Schwalbach. 1995. *Analysis of Sample Size, Counting Time, and Plot Size from an Avian Point Count Survey on Hoosier National Forest, Indiana*. In: Ralph, J.C., J.R. Sauer and S. Droege, editors. *Monitoring Bird Populations by Point Counts*. Technical Report PSW-GTR-149. Pacific Southwest Research Station, Forest Service. 187p.
- U.S. Army Corps of Engineers, Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*. Technical Report Y-87-1. Waterways Experiment Station, Vicksburg, Mississippi. NTIS No. ADA176912.
- U.S. Army Corps of Engineers. 1996. *Planning Aquatic Ecosystem Restoration Monitoring Programs*. Evaluation of Environmental Investments Research Program, IWR Report 96-R-23. Waterways Experiment Station, Vicksburg, Mississippi.
- U.S. Fish and Wildlife Service. 1995. *Migratory Nongame Birds of Management Concern in the United States: The 1995 List*. Office of Migratory Bird Management, U.S. Fish and Wildlife Service, Washington, D.C.

- Welsh, D.A. 1995. *An Overview of the Ontario Forest Bird Monitoring Program in Canada*. In: Ralph, J.C., J.R. Sauer and S. Droege, editors. *Monitoring Bird Populations by Point Counts*. Technical Report PSW-GTR-149. Pacific Southwest Research Station, Forest Service. 187p.
- Wolf, A.T., R.W. Howe and J.L. McDonald. 1995. *Detectability of Forest Birds from Stationary Points in Northern Wisconsin*. In: Ralph, J.C., J.R. Sauer and S. Droege, editors. *Monitoring Bird Populations by Point Counts*. Technical Report PSW-GTR-149. Pacific Southwest Research Station, Forest Service. 187p.
- Wren, C.D., C.A. Bishop, D.L. Stewart and G.C. Barrett. 1997. *Wildlife and Contaminants in Constructed Wetlands and Stormwater Ponds: Current State of Knowledge and Protocols for Monitoring Contaminant Levels and Effects in Wildlife*. Technical Report No. 269. Canadian Wildlife Service, Environmental Conservation Branch, Ontario Region.

## APPENDIX C – RESOURCES FOR MORE INFORMATION

FEDERAL AGENCIES
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***U.S. Army Corps of Engineers, Portland District, Regulatory Branch***

333 SW First Avenue

P.O. Box 2946

Portland, Oregon 97208-2946

Phone: (503) 808-4373

Web: <http://www.nwp.usace.army.mil>

***U.S. Army Corps of Engineers, Institute for Water Resources***

The National Wetland Mitigation Banking Study evaluated the feasibility and appropriateness of wetland mitigation banks. The documents produced to date, as shown below, are available online in a portable document format (pdf) from <http://www.wrsc.usace.army.mil/iwr>. Paper copies can be ordered online or from:

IWR Publications

U.S. Army Corps of Engineers

Water Resources Support Center

Casey Building, 7701 Telegraph Road

Alexandria, Virginia 22315-3868

- *Wetland Mitigation Banking Concepts*, IWR Report 92-WMB-1
- *Wetlands Mitigation Banking: Resource Document*, IWR Report 94-WMB-2
- *Expanding Opportunities for Successful Wetland Mitigation: The Private Credit Market Alternative*, IWR Report 94-WMB-3
- *First Phase Report*, IWR Report 94-WMB-4
- *Examination of Wetland Programs: Opportunities for Compensatory Mitigation*, IWR Report 94-WMB-5
- *Wetland Mitigation Banking*, IWR Report 94-WMB-6
- *Commercial Wetland Mitigation Credit Markets: Theory and Practice*, IWR Report 95-WMB-7
- *Watershed-based Wetlands Planning: A Case Study Report*, IWR Report 95-WMB-8
- *Commercial Wetland Mitigation Credit Ventures: 1995 National Survey*, IWR Report 96-WMB-9

***U.S. Army Corps of Engineers, Environmental Laboratory***

Many of the Corps wetland documents discussed in this guidebook are available online (pdf format) at <http://www.wes.army.mil/el/homepage.html>; their publication numbers and titles are listed below.

- WRP-DE-4: *A Hydrogeomorphic Classification of Wetlands*
- WRP-DE-9: *An Approach for Assessing Wetland Functions Using Hydrogeomorphic Classification, Reference Wetlands, and Functional Indices*
- WRP-DE-11: *A Guidebook for Application of Hydrogeomorphic Assessments to Riverine Wetlands*
- WRP-DE-16: *National Guidebook for Application of Hydrogeomorphic Assessment of Tidal Fringe Wetlands.*
- WRP-RE-19: *Engineering Specification Guidelines for Wetland Plant Establishment and Subgrade Preparation*
- WRP-RE-21: *Wetlands Engineering Handbook*
- WRP-Y-87-1: *Corps of Engineers Wetlands Delineation Manual*

***U.S. Environmental Protection Agency, Region 10, Oregon Operations Office***

811 SW 6<sup>th</sup> Avenue, 3<sup>rd</sup> Floor  
Portland, Oregon 97204  
Phone: (503) 326-2716

***U.S. Environmental Protection Agency, Region 10***

1200 6<sup>th</sup> Avenue  
Seattle, Washington 98101  
Phone: (206) 553-1200 or 1-800-424-4EPA  
Web: <http://www.epa.gov/region10>

***U.S. Fish and Wildlife Service, Oregon State Office***

2600 SE 98<sup>th</sup> Avenue, Suite 100  
Portland, Oregon 97266  
Phone: (503) 231-6179  
Web: <http://www.r1.fws.gov/oregon/index.htm>

***U.S. Fish and Wildlife Service, Pacific Regional Office***

911 NE 11<sup>th</sup> Avenue  
Portland, Oregon 97232-4181  
Phone: (503) 231-6121  
Web: <http://www.pacific.fws.gov>

***U.S. Fish and Wildlife Service, National Wetlands Inventory***

The National Wetlands Inventory produces information on the characteristics, extent, and status of the Nation's wetlands and deepwater habitats. In addition to wetland status and trends reports, over 130 publications, including manuals, plant and hydric soils lists, field guides, posters, wall size resource maps, atlases, and state reports have been produced. A MAPS database containing production information, history, and availability of all maps and digital wetlands data is available over the Internet at <http://www.nwi.fws.gov>. Large scale maps are available for Oregon and paper copies can be purchased from the nearest U.S. Geological Survey Earth Science Information Center (ESIC):

Spokane – ESIC  
U.S. Geological Survey  
U.S. Post Office Building, Rm. 135  
904 West Riverside Avenue  
Spokane, Washington 99201  
Phone: (509) 368-3130

***National Marine Fisheries Service, Oregon State Branch***

525 NE Oregon Street, Suite 500  
Portland, Oregon 97232-2737  
Phone: (503) 231-6880

***National Marine Fisheries Service, Northwest Regional Office***

7600 Sand Point Way, NE  
BIN C15700 – Building 1  
Seattle, Washington 98115-0070  
Phone: (206) 526-6140  
Web: <http://www.nwr.noaa.gov>

***Habitat Conservation Plans, Candidate Conservation Agreements, and Safe Harbor Agreements***

Additional information on the joint regulations and procedures of the U.S. Fish and Wildlife Service and the National Marine Fisheries Service for these programs is available over the Internet at <http://endangered.fws.gov>. Their joint handbook, *Habitat Conservation Planning and Incidental Take Permit Processing Handbook*, dated November 4, 1996, is available at

this site in a portable document format (pdf). An addendum to the handbook is under preparation.

***U.S. Geological Survey, Biological Resources Division, Gap Analysis Program***

530 S. Asbury Street, Suite 1

Moscow, Idaho 83843

Phone: (208) 885-3565

Web: <http://www.gap.uidaho.edu>



STATE AGENCIES

***Oregon Division of State Lands***

775 Summer Street NE  
Salem, Oregon 97310-1337  
Phone: (503) 378-3805  
Web: <http://www.statelands.dsl.state.or.us>

***Eastern Regional Office***

20300 Empire Avenue, #B-1  
Bend, Oregon 97701  
Phone: (541) 388-6112

***State Historic Preservation Office***

1115 Commercial NE  
Salem Oregon 97301-1012  
Main phone number: (503) 378-6305  
Web: <http://www.prd.state.or.us>

***Oregon Department of Fish and Wildlife***

2501 SW First Avenue  
Portland, Oregon 97207  
Phone: (503) 872-5268  
Web: <http://www.dfw.state.or.us>

***South Willamette Watershed District***

7118 N.E. Vandenburg Avenue  
Corvallis, Oregon 97330-9446  
Phone: (541) 757-4186

***High Desert Region***

61374 Parrell Road  
Bend, Oregon 97702  
Phone: (541) 388-6363 (Bend)  
(541) 573-6582 (Hines)

***North West Region***

17330 S.E. Evelyn Street  
Clackamas, Oregon 97015  
Phone: (503) 657-2000

***Southwest Region***

4192 N. Umpqua Highway  
Roseburg, Oregon 97470  
Phone: (541) 440-3353

***Northeast Region***

***Marine Program***

107 - 20th Street  
LaGrande, Oregon 97850  
Phone: (541) 963-2138

2040 SE Marine Science Dr  
Newport, Oregon 97365  
Phone: (541) 867-4741

***Oregon Department of Land Conservation and Development***

635 Capitol Street NE, Suite 150  
Salem, Oregon 97301  
Phone: (503) 373-0050 Ext. 221  
Web: <http://lcd.state.or.us>

*Portland Field Office*

Portland State Office Bldg, Suite 1145  
800 NE Oregon Street #18  
Portland, Oregon 97232  
Phone: (503) 731-4065

*Southern Oregon Office*

155 N. First Street  
Central Point, Oregon 97502  
Phone: (541) 858-3152

*Bend Field Office*

Empire Corporate Center  
20300 Empire Ave., Suite B-1  
Bend, Oregon 97701  
Phone: (541) 388-6424 or 388-6157

***Oregon Department of Environmental Quality***

811 SW Sixth Avenue  
Portland, Oregon 97204-1390  
Phone: (503) 229-5696  
800-452-4011 (toll free in Oregon)  
Web: <http://www.deq.state.or.us>

*Northwest Regional Office*

(Portland area and west to coast)  
2020 SW 4<sup>th</sup> Avenue, #400  
Portland, Oregon 97201  
Phone: (503) 229-5263

*Western Regional Office*

(Salem south to California border)  
1102 Lincoln Street, Suite 210  
Eugene, Oregon 97401  
Phone: (541) 686-7838

*Eastern Regional Office*

(central and eastern Oregon)  
2146 NE 4<sup>th</sup>  
Bend, Oregon 97701  
Phone: (541) 388-6146

***Oregon Water Resources Department***

158 12<sup>th</sup> Street NE  
Salem, Oregon 97301  
Phone: (503) 378-8455  
800-624-3199 (toll free in Oregon)  
Web: <http://www.wrd.state.or.us>

*Southwest Regional Office*

942 SW 6<sup>th</sup> Street, Suite E  
Grants Pass, Oregon 97526  
Phone: (541) 471-2886

*South Central Regional Office*

1340 NW Wall Street, Suite 100  
Bend, Oregon 97701  
Phone: (541) 388-6669

*North Central Regional Office*

116 SE Dorion  
Pendleton, Oregon 97801  
Phone: (541) 278-5456

*Eastern Regional Office*

Baker County Courthouse  
1995 3<sup>rd</sup> Street  
Baker City, Oregon 97814  
Phone: (541) 523-8224

***Oregon Department of Agriculture, Natural Resources Division***

635 Capitol Street NE  
Salem, Oregon 97310  
Phone: (503) 986-4550  
Web: <http://www.oda.state.or.us>

***Oregon Natural Heritage Program***

821 SE 14<sup>th</sup> Avenue  
Portland, Oregon 97214  
Phone: (503) 731-3070, Ext. 335 or 338  
Web: <http://www.heritage.tnc.org/nhp/us/or>

## APPENDIX D – OREGON ADMINISTRATIVE RULES FOR MITIGATION BANKS

### Compensatory Wetland Mitigation Banking

#### 141-085-0400

##### Purpose

These rules describe when, and under what conditions, the Division will allow mitigation banking as a means of wetland compensation when fill or removal of material is proposed in wetlands regulated by the State of Oregon. Mitigation banking is used to provide larger scale compensatory wetland mitigation in advance of anticipated smaller wetland losses. These rules also specify the requirements to obtain authorization to develop a wetland mitigation bank.

Stat. Auth.: ORS 273.045 & ORS 273.051

Stats. Implemented: ORS 196.600 & ORS 196.665

Hist.: LB 2-1997, f. & cert. ef. 2-14-97

#### 141-085-0406

##### Applicability

(1) These rules shall apply to:

- (a) All wetland mitigation banks proposed after rule adoption; and
- (b) Existing mitigation banks which are substantially modified after rule adoption.

(2) The sponsor of a mitigation bank which has been proposed, is under construction, or was established prior to the adoption of these rules, may request that the Division apply the provisions of these rules to the proposed, under construction, or established bank.

Stat. Auth.: ORS 273.045 & ORS 273.051

Stats. Implemented: ORS 196.600 & ORS 196.665

Hist.: LB 2-1997, f. & cert. ef. 2-14-97

#### 141-085-0410

##### Policies

(1) Mitigation banks, as described under the Oregon Wetlands Mitigation Bank Act of 1987 (ORS 196.600 through 196.665), can only be used to provide compensatory wetland mitigation for

anticipated losses in wetland function(s) and value(s) when on-site mitigation is not practicable or when off-site mitigation is environmentally preferable.

(2) The availability or use of mitigation banks shall not:

(a) Create a presumption that the Division will be more willing to allow wetland losses under the Removal-Fill Law (ORS 196.800 through 196.990); or

(b) Eliminate the requirement to fully demonstrate that the applicant for a Removal-Fill Permit has considered alternatives that avoid and/or minimize losses to jurisdictional wetlands; and

(c) Eliminate the requirement to comply with 141-085-0045, Removal Permit Policy and 141-085-0050, Fill Permit Policy.

(3) Both freshwater and estuarine mitigation banks shall only be debited for wetland losses pursuant to the provisions of ORS 196.620 regarding the mitigation service area limits of all banks.

(4) Mitigation banks shall be designed to compensate for expected or historic wetland losses to:

(a) Ensure maintenance of regional wetland function in their service area;

(b) More closely match the demand for wetland credits with wetland losses; and

(c) Meet other ecological or watershed needs as determined by the Division.

(5) The long-term goal of mitigation banks is to provide compensatory wetland mitigation in advance of wetland losses.

(6) Restoration of wetlands shall be a priority over creation, enhancement, protection and all other forms of credit generation in the establishment of credits in wetland mitigation banks consistent with Compensatory Mitigation Priorities at OAR 141-085-0120.

(7) Mitigation banks shall be subject to all rules governing freshwater and estuarine resource replacement in OAR 141-085-0101 through 141-085-0266.

Stat. Auth.: ORS 273.045 & ORS 273.051

Stats. Implemented: ORS 196.600 & ORS 196.665

Hist.: LB 2-1997, f. & cert. ef. 2-14-97

## **141-085-0415**

### **Definitions**

(1) "Baseline Conditions" means the ecological conditions, wetland and/or habitat functions and values, and the vegetative, soils, and hydrological characteristics present at a site prior to creating a mitigation bank.

- (2) "Basin" means one of the eighteen (18) Oregon drainage basins identified by the Oregon Water Resources Department as shown on maps published by that agency.
- (3) "Buffer" means an upland area immediately adjacent to, surrounding, or within a wetland that improves or maintains the functioning of that wetland.
- (4) "Certified Credit" results when the wetland mitigation bank has met or exceeded the performance standards established in its Mitigation Bank Instrument. Once credits are certified, they are available for sale or exchange.
- (5) "Division" means the Oregon Division of State Lands.
- (6) "Director" means the Director of the Oregon Division of State Lands or the Director's designee.
- (7) "Financial Assurance(s)" means the money or other form of financial instrument (for example, surety bonds, trust funds, escrow accounts, proof of stable revenue sources for public agencies) required of the sponsor to ensure that the functions of the subject bank are achieved and maintained over the long-term pursuant to the terms and conditions of the Mitigation Bank Instrument.
- (8) "Functional Assessment" means the ecological assessment of the degree to which a wetland is performing, or is capable of performing, specific wetland functions.
- (9) "Mitigation Bank" or "Bank" means wetland(s) and any associated buffer(s) restored, enhanced, created, or protected, whose credits may be sold or exchanged to compensate for unavoidable future wetland losses due to removal, fill, or alteration activities. ORS 196.600(2) further defines this term.
- (10) "Mitigation Bank Credit" or "Credit" is a unit of measure of the increase in wetland functional value achieved at a mitigation site. Wetland credits are the unit of exchange for compensatory wetland mitigation. ORS 196.600(1) further defines this term.
- (11) "Mitigation Bank Instrument" or "Instrument" is the final document approved by the Division that formally establishes the wetland mitigation bank and stipulates the terms and conditions of its construction, operation, and long-term management. The Instrument is usually in the form of a memorandum of agreement signed by members of the Mitigation Bank Review Team (MBRT) , but an order from the Division makes the Instrument legally binding and enforceable if a removal-fill permit is not required to construct the bank.
- (12) "Mitigation Bank Prospectus" or "Prospectus" is a preliminary document prepared by a mitigation bank sponsor describing a proposed bank in detail sufficient to enable initial review by the Division. The Division uses the Prospectus to initially determine whether the proposed bank would be technically feasible, whether the bank is likely to be needed, and whether the bank can meet the policies stated in these rules.
- (13) "Mitigation Bank Review Team" or "MBRT" is an advisory committee to the Division and the Corps on wetland mitigation bank projects.

(14) "Mitigation Bank Sponsor" or "Sponsor" is a person who is proposing, or has established and/or is maintaining a mitigation bank. The sponsor is the entity that assumes all legal responsibilities for carrying-out the terms of the Instrument unless specified otherwise explicitly in the Instrument.

(15) "Person" is an individual, a political subdivision or government agency, or any corporation, association, firm, partnership, joint stock company, limited liability company, limited liability partnership, or quasi-public corporation registered to do business in the State of Oregon.

(16) "Reference Site" means a site or sites that have the same characteristics as those proposed for compensatory mitigation. Reference sites are typically wetlands that exemplify the goals of the mitigation effort.

(17) "Service Area" is that area in which credits from a mitigation bank can be used to compensate for unavoidable wetland losses due to removal, fill, or alteration activities.

(18) "Subbasin" is a drainage area smaller than a basin.

(19) "U.S. Army Corps of Engineers" or "Corps" means the United States Army Corps of Engineers or, when the Food Security Act is applicable, the Natural Resources Conservation Service (NRCS) acting in place of the Corps.

Stat. Auth.: ORS 273.045 & ORS 273.051

Stats. Implemented: ORS 196.600 & ORS 196.665

Hist.: LB 2-1997, f. & cert. ef. 2-14-97

#### **141-085-0421**

#### **Requirements to Establish a Mitigation Bank**

(1) All persons proposing to establish a mitigation bank shall:

(a) Meet with the Division to discuss their proposed bank and the content of their Prospectus.

(b) Prepare and submit a Mitigation Bank Prospectus to the Division.

(2) The Mitigation Bank Instrument shall contain the following elements, as applicable:

(a) The location of the proposed bank and identification of service area (indicated through the use of maps or aerial photographs clearly showing recognizable geographic place names, features, and/or watershed boundaries).

(b) Demonstration of need for the bank as shown by past removal-fill activities, projected demographics for the proposed service area, statements of expected activities from the local planning agency, and like documentation.

(c) List of adjacent property owners within five-hundred (500) feet of any boundary of the proposed bank.

(d) Proof of ownership of, or explicit legal and recordable permission granted by the landowner to perpetually dedicate the land upon which the bank and any associated buffer is proposed.

(e) Site plan for the mitigation area indicating the location of hydro-geomorphic and Cowardin wetland classes to be produced at the site, areas where grading will be required, location of buffers, vegetation planting plan, etc.

(f) Description of former or current uses of the proposed bank site which may have resulted in contamination by toxic materials.

(g) Description of the ecological goals and objectives of the bank.

(h) Description of the potential for the bank to provide wetland functions such as flood storage and shoreline protection, wildlife and fisheries habitat, wildlife corridors, and/or filtration of nutrients and pollution reduction.

(i) Description of the effects of adjacent existing, potential, and proposed land uses on the proposed bank.

(j) Description of the wetland losses by hydrogeomorphic and Cowardin wetland classes for which the bank will be designed to offer credits.

(k) Description of the specific and measurable performance standards against which the development of the credits in the bank will be judged.

(l) Description of reference site(s), if proposed, and their relationship to OAR 141-085-0421(2) (j) of these rules.

(m) A site assessment of the proposed bank area providing information on the:

(A) Hydrogeomorphic and Cowardin wetland classes;

(B) Ecological baseline characterizing the vegetation, soils, hydrology, and wildlife habitat and usage; and

(C) Results of a wetland determination or delineation.

(n) Description of the method(s) used to determine the availability of credits at the proposed bank, as well as those which will be used to account for and report credit and debit transactions.

(o) Total estimated project cost itemized by major cost elements (for example, land acquisition, bank design and construction, consulting and legal fees, maintenance and monitoring over the long-term, and contingency fund).



(p) Proof that the sponsor has the financial resources to undertake, operate, and maintain the proposed bank over the long-term, as well as the ability to correct project deficiencies or performance failures.

(q) Description of the frequency and sampling protocols used to monitor bank elements, and the name(s) and qualifications of the person(s) who will conduct such monitoring.

(r) Detailed contingency plan describing how project deficiencies or performance failures will be corrected, including assignment of responsibilities for failures such as earthquakes, floods, vandalism, damage by pests and wildlife, invasion by undesirable vegetation, etc.

(s) Proof in the form of written approval from the local government and in zone designations for the mitigation bank site and surrounding lands, applicable overlay zones, permitted and conditional uses in base and overlay zones, applicable local policies, and identification of necessary local permits and other approvals that the wetland bank is consistent with the requirements of all applicable local comprehensive plans and land use regulations, watershed management plans, and/or other applicable land use plans.

(t) All items required in Compensatory Mitigation Plans For Non-Minor Projects provided in OAR 141-085-0155.

(u) Drafts of proposed long-term protection measures (such as conservation easements, deed restrictions, donation to non-profit environmental groups, etc.), and management plans, and mechanisms for funding. Prior to approval of the Instrument, these documents shall be signed and recorded with the appropriate government agency.

(v) Statement indicating when each of the conditions of the Instrument will terminate, unless they are perpetual in nature.

(3) The Division will review the Prospectus for sufficiency, and shall notify the sponsor in writing of the sufficiency of the document within thirty days (30) days of receipt. Each submittal containing substantial revisions shall restart the time clock.

(4) Any Prospectus received by the Division which does not provide sufficient information for review, or that appears to present a proposal in which the Division will not participate, will be returned to the sponsor with a written explanation.

(5) The Division reserves the right to decline to participate in the development of a Mitigation Bank Instrument and may, instead, suggest other options to the sponsor including the standard Removal-Fill Permit process, or participation in other wetland stewardship options if the sponsor cannot demonstrate:

(a) Need for the mitigation credits; or that

(b) The bank is technically feasible and ecologically desirable.

(6) Upon determining that the Prospectus is sufficient, the Division shall give public notice of the Prospectus. This notice shall be called "Intent To Create A Mitigation Bank" and shall:

(a) Be published not less than once each week for three (3) successive weeks in a statewide newspaper and in a newspaper of general circulation in the area where the mitigation bank will be located.

(b) Be sent to city and county planning departments, and state agencies having jurisdiction over the mitigation bank site(s), adjacent landowners, and persons requesting such notices.

(c) Briefly describe the proposed mitigation bank and reference the Prospectus provided by the bank sponsor.

(d) Indicate that comments shall be accepted by the Division for thirty (30) calendar days from the date of the public notice.

(7) A Mitigation Bank Review Team (MBRT) shall be formed within thirty (30) days of the date of the public notice. An MBRT shall not have more than ten (10) members, and shall be chaired jointly by a representative of the Division and, if applicable, the Corps. When the Corps does not participate in a mitigation bank proposal, the Division may, but is not obligated to, invite other federal involvement.

(a) The members of a MBRT shall be selected jointly by the Division and the Corps. Each of the following agencies will be asked to nominate a representative to participate in each MBRT:

(A) Oregon Department of Environmental Quality;

(B) Oregon Department of Fish and Wildlife;

(C) Oregon Department of Land Conservation and Development;

(D) U.S. Fish and Wildlife Service;

(E) U.S. Environmental Protection Agency;

(F) Soil and Water Conservation District; and

(G) Local Government Planner, or equivalent.

(b) Other members of the MBRT shall be selected based on the nature and location of the project, particular interest in the project by persons or groups, and/or any specific expertise which may be required by the Division and the Corps in development of the Instrument.

(8) The MBRT shall:

(a) Review and comment upon the Prospectus, and provide input to the Division concerning deficiencies noted, and additional information required.

(b) Consider the comments received in response to the notice of "Intent To Create A Mitigation Bank."

(c) Assist with the drafting of the Instrument.

(d) Determine an appropriate level of financial assurance to ensure project development, construction, long-term maintenance and monitoring, and the ability of the sponsor to correct project deficiencies or performance failures.

(e) Review the performance of the bank annually, or more frequently as set by the MBRT, to determine whether it is in compliance with the ecological goals and objectives established in the Instrument, and continues to hold adequate financial resources and assurances to ensure continued long-term operation pursuant to those goals and objectives. This review may include site visits and audits of bank documents at irregular time periods.

(f) The consensus of the MBRT shall be fully considered by the Division.

(9) A sponsor may begin construction of a bank prior to developing an Instrument by:

(a) Providing detailed documentation of the baseline conditions existing at the proposed site(s) of the bank; and

(b) Receiving written consent from the Division prior to undertaking any construction. However, such consent from the Division does not exempt the sponsor from having to apply for, and obtain a Removal-Fill Permit, if required. Written consent from the Division recognizes the sponsor's intent to create a bank only, but does not guarantee subsequent approval of the Mitigation Banking Instrument by the Division, who assumes no liability for the sponsor's actions.

(10) The Instrument shall:

(a) Contain all information listed in OAR 141-085-0421(2) of these rules, as well as any other data required by the Division.

(b) Be approved and signed by the Division and the sponsor, at the discretion of the Division.

(c) Be subject to revision over time as mutually agreed to by the signers of the Instrument.

(11) Upon approval of the Instrument, the Division shall give public notice of the approval of the Mitigation Bank Instrument. This notice shall be called "Notice Of Mitigation Bank Instrument Approval" and shall:

(a) Be published not less than once each week for three (3) successive weeks in a statewide newspaper and in a newspaper of general circulation in the area where the mitigation bank will be located.

(b) Be sent to affected city and county planning departments, affected state agencies, adjacent landowners, and persons requesting such notices.

(c) Briefly describe the proposed mitigation bank and reference the Mitigation Bank Instrument.

Stat. Auth.: ORS 273.045 & ORS 273.051

Stats. Implemented: ORS 196.600 & ORS 196.665

Hist.: LB 2-1997, f. & cert. ef. 2-14-97

**141-085-0425**

**Establishment of Mitigation Credits**

(1) Credits can be established by using:

(a) The ratios stipulated in OAR 141-085-0135 (Compensatory Mitigation Ratios) or in OAR 141-085-0256 (Mitigation Policy Generally); or

(b) Any other wetland and habitat functional assessment and evaluation methodology approved by the Division which provides that credits within a bank are determined by the difference between the baseline conditions of the bank prior to restoration, enhancement, or creation activities, and the increased wetland functions and values that result, or are expected to result, from those activities.

(2) Regardless of the credit determination methodology used, no less than a 1:1 bank to wetland loss ratio shall be allowed as calculated on an area basis.

(3) Additional credits within the bank may be realized contingent on achievement of the performance standards contained in the Instrument over time and subject to the discretion of the Division. These credits are derived from the increased wetland functions that accrue as wetlands in the bank improve over time. Wetlands that are enhanced should exhibit a measurable increase in wetland function more readily than those that are created. Credits generated by restoration may be subject to certification at an earlier date. Adjustments in credits shall be calculated based on superior performance as follows:

(a) For banks utilizing ratios provided in OAR 141-085-0135 or OAR 141-085-0256:

(A) After five (5) years, the remaining enhanced wetland credits within the bank may be increased by no more than one-third and after ten (10) years, remaining enhanced wetland credits may be increased by no more than two-thirds;

(B) After ten (10) years or more, the remaining created wetland credits within the bank may be increased by no more than one-half.

(C) For the purpose of calculating available credits by these rules, the new number of credits is determined by multiplying the relative proportion of restored, enhanced, created, and/or protected wetlands and buffers present at the time of bank establishment by the total number of credits remaining.

(b) For banks using wetland assessment methods other than the ratios provided in OAR 141-085-0135 or OAR 141-085-0256, remaining credits within the bank may be re-evaluated at five (5), and ten (10) year intervals at the discretion of the Division. A new number of available credits may be realized using the same assessment method as originally employed to determine credits expected to be generated from the bank. OAR 141-085-0425(4) of these rules does not apply

when the chosen assessment method evaluates the included upland buffers along with the wetlands because credits for inclusion of upland buffers in the bank shall not be counted twice.

(4) Credits may be granted on an area basis for upland buffers at the discretion of the Division. The calculation provided here is only for banks using ratios provided in OAR 141-085-0135 or OAR 141-085-0256 and wetland functional assessment methods that do not evaluate buffers. However, such credits can only be established if the buffers are included as an integral part of the bank, a majority of credits are generated by the bank are from wetland restoration, enhancement, or creation, and all performance standards required in the Instrument are met. Credits for buffers will be determined as follows:

(a) Five (5) years after construction, credits for buffers may be granted. Depending on the quality of the buffer, between 10 to 20 acres of buffer will produce one (1) acre of wetland credit.

(b) Ten (10) years after construction, credits for buffers may again be calculated. Depending on the quality of the buffer, between 5 to 10 acres of buffer will produce one (1) acre of wetland credit.

(5) Credit for the protection of existing wetlands shall be considered only if:

(a) The area(s) to be preserved exhibit(s) healthy wetland functions and values that are not likely to be increased appreciably by restoration or enhancement;

(b) The functions and values of the wetlands proposed for protection are clearly threatened by human activities outside of the control of the bank sponsor;

(c) Additional protections such as upland buffers, fencing, and removal of contaminated soils, in addition to appropriate long-term protection measures that will substantially reduce the threat are proposed; and

(d) The applicant provides proof of ownership of, or explicit legal and recordable permission granted by the landowner, to perpetually dedicate the protection wetland(s) and buffer(s) through any mechanism that unequivocally preserves the functions and values of the wetland(s);

(e) The applicant provides documentation of the signed and recorded perpetual protection mechanisms.

(6) Mitigation bank credits for protection of existing wetlands may be granted on an area basis at no less than a 10:1 ratio for wetland(s) protected to wetland(s) lost.

(7) All adjustments in credits shall be applied only to those credits remaining in, or newly added to, the bank.

(8) The Division reserves the right to allow a bank sponsor to create credits by improving nonwetland ecological resources such as in-stream channel habitat, riparian floodplains, non-wetland inclusions in wetland/upland mosaics, and other ecosystem components provided that a bank producing credits in such a manner has generated a majority of its credits by wetland restoration, enhancement, or creation.

Stat. Auth.: ORS 273.045 & ORS 273.051

Stats. Implemented: ORS 196.600 & ORS 196.665

Hist.: LB 2-1997, f. & cert. ef. 2-14-97

### **141-085-0430**

#### **Use and Sale of Mitigation Credits**

(1) Mitigation credits may only be purchased from a sponsor to offset permitted wetland losses under the Removal-Fill Law. Credit sales and purchases for future anticipated impacts not part of Removal-Fill Permit applications are prohibited.

(2) The maximum number of credits that may be sold in advance of certification of the bank credits by the Division shall be clearly specified in the Instrument. In no case shall more than thirty (30%) of the total credits expected to be produced initially by the bank be sold prior to their certification.

(3) The Division shall not allow the sale or exchange of credits by a mitigation bank that is not in compliance with the terms of the Instrument, the Removal-Fill Law, and all rules governing freshwater and estuarine resource replacement in OAR 141-085-0101 through 141-085-0266. The Division may consult with the MBRT for the bank in order to determine noncompliance and appropriate remedies, including enforcement action.

Stat. Auth.: ORS 273.045 & ORS 273.051

Stats. Implemented: ORS 196.600 & ORS 196.665

Hist.: LB 2-1997, f. & cert. ef. 2-14-97

### **141-085-0436**

#### **Siting of Mitigation Banks**

(1) Banks shall be sited in locations where they will conflict to the least extent possible with other existing and potential land uses, while yielding the most functional benefits.

(2) Ecological criteria to be considered in the siting of banks include:

- (a) Maintenance and enhancement of wildlife/fish habitat and corridors.
- (b) Reliability of hydrological sources.
- (c) Ability to provide stormwater storage/flood attenuation.
- (d) Ability to enhance the water quality of the watershed.

(e) Ability to provide buffers for the site(s).

(f) Ability to provide a diversity of wetlands.

(g) Proximity to large undisturbed uplands, wetlands or other riverine or aquatic systems.

(h) Absence of disturbance by man (airports, dumping, vehicular intrusion, nearby presence of exotic species, etc.)

(i) Presence of rare plants or animals and the ability of the bank to accommodate them.

(3) Banks on public lands shall be allowed provided that the public agency owning or having authority over the subject land(s) grants its approval and perpetually dedicates the land upon which the bank, and any associated buffer, is proposed.

Stat. Auth.: ORS 273.045 & ORS 273.051

Stats. Implemented: ORS 196.600 & ORS 196.665

Hist.: LB 2-1997, f. & cert. ef. 2-14-97

#### **141-085-0440**

##### **Removal-Fill Permits for Mitigation Banks**

(1) Bank sponsors shall be required to obtain Removal-Fill Permits if any of the actions necessary to create the proposed bank are subject to the requirements of the Removal-Fill Law (ORS 196.800 through 196.990) .

(2) When removal-fill permits are not required to establish a mitigation bank, the Instrument shall be accompanied by an order from the Division.

(3) If a Removal-Fill Permit is required for a bank, the Instrument shall become a part of that permit and an order will not then be required from the Division.

Stat. Auth.: ORS 273.045 & ORS 273.051

Stats. Implemented: ORS 196.600 & ORS 196.665

Hist.: LB 2-1997, f. & cert. ef. 2-14-97

#### **141-085-0445**

##### **Appeals**

A sponsor or any other person who is adversely affected or aggrieved by the decision to approve or deny a removal-fill permit or order for a Mitigation Bank Instrument may appeal the decision of the Director.

(1) Such an appeal shall be received by the Director no later than thirty (calendar days after the date of issuance of decision.

(2) The Director shall decide the appeal within sixty (60) calendar days after the date of the receipt of the appeal.

(3) The Director may affirm the decision, issue a new or modified decision, or request the appellant to submit additional information to support the appeal.

Stat. Auth.: ORS 273.045 & ORS 273.051

Stats. Implemented: ORS 196.600 & ORS 196.665

Hist.: LB 2-1997, f. & cert. ef. 2-14-97



## **APPENDIX E – FEDERAL GUIDANCE FOR MITIGATION BANKS**

### **NOTICE**

*Federal Register*: November 28, 1995 (Volume 60, Number 228), pages 58605-58614

#### **DEPARTMENT OF DEFENSE**

Department of the Army  
Corps of Engineers

#### **ENVIRONMENTAL PROTECTION AGENCY**

#### **DEPARTMENT OF AGRICULTURE**

Natural Resources Conservation Service

#### **DEPARTMENT OF THE INTERIOR**

Fish and Wildlife Service

#### **DEPARTMENT OF COMMERCE**

National Oceanic and Atmospheric Administration

**AGENCIES:** Corps of Engineers, Department of the Army, DOD; Environmental Protection Agency; Natural Resources Conservation Service, Agriculture; Fish and Wildlife Service, Interior; and National Marine Fisheries Service, National Oceanic and Atmospheric Administration, Commerce.

**ACTION:** Notice.

**SUMMARY:** The Army Corps of Engineers (Corps), Environmental Protection Agency (EPA), National Resources Conservation Service (NRCS), Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS) are issuing final policy guidance regarding the establishment, use and operation of mitigation banks for the purpose of providing compensation for adverse impacts to wetlands and other aquatic resources. The purpose of this guidance is to clarify the manner in which mitigation banks may be used to satisfy mitigation requirements of the Clean Water Act (CWA) Section 404 permit program and the wetland conservation provisions of the Food Security Act (FSA) (i.e., “Swampbuster” provisions). Recognizing the potential benefits mitigation banking offers for streamlining the permit evaluation process and providing more effective mitigation for authorized impacts to wetlands, the agencies encourage the establishment and appropriate use of mitigation banks in the Section 404 and “Swampbuster” programs.

**DATES:** The effective date of this Memorandum to the Field is December 28, 1995.

**FOR FURTHER INFORMATION CONTACT:** Mr. Jack Chowning (Corps) at (202) 761-1781; Mr. Thomas Kelsch (EPA) at (202) 260-8795; Ms. Sandra Byrd (NRCS) at (202) 690-3501; Mr. Mark Miller (FWS) at (703) 358-2183; Ms. Susan-Marie Stedman (NMFS) at (301) 713-2325.

**SUPPLEMENTARY INFORMATION:** Mitigating the environmental impacts of necessary development actions on the Nation's wetlands and other aquatic resources is a central premise of Federal wetlands programs. The CWA Section 404 permit program relies on the use of compensatory mitigation to offset unavoidable damage to wetlands and other aquatic resources through, for example, the restoration or creation of wetlands. Under the "Swampbuster" provisions of the FSA, farmers are required to provide mitigation to offset certain conversions of wetlands for agricultural purposes in order to maintain their program eligibility.

Mitigation banking has been defined as 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. It typically involves the consolidation of small, fragmented wetland mitigation projects into one large contiguous site. Units of restored, created, enhanced or preserved wetlands are expressed as "credits" which may subsequently be withdrawn to offset "debits" incurred at a project development site. Ideally, mitigation banks are constructed and functioning in advance of development impacts, and are seen as a way of reducing uncertainty in the CWA Section 404 permit program or the FSA "Swampbuster" program by having established compensatory mitigation credit available to an applicant. By consolidating compensation requirements, banks can more effectively replace lost wetland functions within a watershed, as well as provide economies of scale relating to the planning, implementation, monitoring and management of mitigation projects.

On August 23, 1993, the Clinton Administration released a comprehensive package of improvements to Federal wetlands programs which included support for the use of mitigation banks. At that same time, EPA and the Department of the Army issued interim guidance clarifying the role of mitigation banks in the Section 404 permit program and providing general guidelines for their establishment and use. In that document it was acknowledged that additional guidance would be developed, as necessary, following completion of the first phase of the Corps Institute for Water Resources national study on mitigation banking.

The Corps, EPA, NRCS, FWS and NMFS provided notice [60 FR 12286; March 6, 1995] of a proposed guidance on the policy of the Federal government regarding the establishment, use and operation of mitigation banks. The proposed guidance was based, in part, on the experiences to date with mitigation banking, as well as other environmental, economic and institutional issues identified through the Corps national study. Over 130 comments were received on the proposed guidance. The final guidance is based on full and thorough consideration of the public comments received.

A majority of the letters received supported the proposed guidance in general, but suggested modifications to one or more parts of the proposal. In response to these comments, several changes have been made to further clarify the provisions and make other modifications, as necessary, to ensure effective establishment and use of mitigation banks. One key issue on which the agencies received numerous comments focused on the timing of credit withdrawal. In order to provide additional clarification of the changes made to the final guidance in response to comments, the agencies wish to emphasize that it is our intent to ensure that decisions to allow

credits to be withdrawn from a mitigation bank in advance of bank maturity be made on a case-by-case basis to best reflect the particular ecological and economic circumstances of each bank. 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. Copies of the comments and the agencies' response to significant comments are available for public review. Interested parties should contact the agency representatives for additional information.

This guidance does not change the substantive requirements of the Section 404 permit program or the FSA "Swampbuster" program. Rather, it interprets and provides internal guidance and procedures to the agency field personnel for the establishment, use and operation of mitigation banks consistent with existing regulations and policies of each program. The policies set out in this document are not final agency action, but are intended solely as guidance. The guidance is not intended, nor can it be relied upon, to create any rights enforceable by any party in litigation with the United States. The guidance does not establish or affect legal rights or obligations, establish a binding norm on any party and it is not finally determinative of the issues addressed. Any regulatory decisions made by the agencies in any particular matter addressed by this guidance will be made by applying the governing law and regulations to the relevant facts. The purpose of the document is to provide policy and technical guidance to encourage the effective use of mitigation banks as a means of compensating for the authorized loss of wetlands and other aquatic resources.

John H. Zirschky,  
Acting Assistant Secretary (Civil Works),  
Department of the Army.

Robert Perciasepe,  
Assistant Administrator for Water,  
Environmental Protection Agency.

James R. Lyons,  
Assistant Secretary, Natural Resources and Environment,  
Department of Agriculture.

George T. Frampton, Jr.,  
Assistant Secretary for Fish and Wildlife and Parks,  
Department of the Interior.

Douglas K. Hall,  
Assistant Secretary for Oceans and Atmosphere,  
Department of Commerce.

## **Memorandum to the Field**

### **Subject: Federal Guidance for the Establishment, Use and Operation of Mitigation Banks**

#### I. Introduction

##### A. Purpose and Scope of Guidance

This document provides policy guidance for the establishment, use and operation of mitigation banks for the purpose of providing compensatory mitigation for authorized adverse impacts to wetlands and other aquatic resources. This guidance is provided expressly to assist Federal personnel, bank sponsors, and others in meeting the requirements of Section 404 of the Clean Water Act (CWA), Section 10 of the Rivers and Harbors Act, the wetland conservation provisions of the Food Security Act (FS) (i.e., “Swampbuster”), and other applicable Federal statutes and regulations. The policies and procedures discussed herein are consistent with current requirements of the Section 10/404 regulatory program and “Swampbuster” provisions and are intended only to clarify the applicability of existing requirements to mitigation banking. The policies and procedures discussed herein are applicable to the establishment, use and operation of public mitigation banks, as well as privately-sponsored mitigation banks, including third party banks (e.g. entrepreneurial banks).

##### B. Background

For purposes of this guidance, mitigation banking means 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. The objective of a mitigation bank is to provide for the replacement of the chemical, physical and biological functions of wetlands and other aquatic resources which are lost as a result of authorized impacts. Using appropriate methods, the newly established functions are quantified as mitigation “credits” which are available for use by the bank sponsor or by other parties to compensate for adverse impacts (i.e., “debits”). Consistent with mitigation policies established under the Council on Environmental Quality Implementing Regulations (CEQ regulations) (40 CFR Part 1508.20), and the Section 404(b)(1) Guidelines (Guidelines) (40 CFR Part 230), the use of credits may only be authorized for purposes of complying with Section 10/404 when adverse impacts are unavoidable. In addition, for both the Section 10/404 and “Swampbuster” programs, credits may only be authorized when on-site compensation is either not practicable or use of a mitigation bank is environmentally preferable to on-site compensation. Prospective bank sponsors should not construe or anticipate participation in the establishment of a mitigation bank as ultimate authorization for specific projects, as excepting such projects from any applicable requirements, or as preauthorizing the use of credits from that bank for any particular project.

Mitigation banks provide greater flexibility to applicants needing to comply with mitigation requirements and can have several advantages over individual mitigation projects, some of which are listed below:

1. It may be more advantageous for maintaining the integrity of the aquatic ecosystem to consolidate compensatory mitigation into a single large parcel or contiguous parcels when ecologically appropriate;
2. Establishment of a mitigation bank can bring together financial resources, planning and scientific expertise not practicable to many project-specific compensatory mitigation proposals. This consolidation of resources can increase the potential for the establishment and long-term management of successful mitigation that maximizes opportunities for contributing to biodiversity and/or watershed function;
3. Use of mitigation banks may reduce permit processing times and provide more cost-effective compensatory mitigation opportunities for projects that qualify;
4. Compensatory mitigation is typically implemented and functioning 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. Consolidation of compensatory mitigation within a mitigation bank increases the efficiency of limited agency resources in the review and compliance monitoring of mitigation projects, and thus improves the reliability of efforts to restore, create or enhance wetlands for mitigation purposes;
6. The existence of mitigation banks can contribute towards attainment of the goal for no overall net loss of the Nation's wetlands by providing opportunities to compensate for authorized impacts when mitigation might not otherwise be appropriate or practicable.

## II. Policy Considerations

The following policy considerations provide general guidance for the establishment, use and operation of mitigation banks. It is the agencies' intent that this guidance be applied to mitigation bank proposals submitted for approval on or after the effective date of this guidance and to those in early stages of planning or development. It is not intended that this policy be retroactive for mitigation banks that have already received agency approval. While it is recognized that individual mitigation banking proposals may vary, it is the intent of this guidance that the fundamental precepts be applicable to future mitigation banks.

For the purposes of Section 10/104, and consistent with the CEQ regulations, the Guidelines, and the Memorandum of Agreement Between the Environmental Protection Agency (EPA) and the Department of the Army Concerning the Determination of Mitigation under the Clean Water Act Section 404(b)(1) Guidelines, mitigation means sequentially avoiding impacts, minimizing impacts, and compensating for remaining unavoidable impacts. 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. A site where wetlands and/or other aquatic resources are restored, created, enhanced, or in exceptional circumstances, preserved expressly for the purpose of providing compensatory mitigation in advance of authorized impacts to similar resources is a mitigation bank.

### A. Authorities

This guidance is established in accordance with the following statutes, regulations, and policies. It is intended to clarify provisions within these existing authorities and does to establish any new requirements.

1. Clean Water Act Section 404 (33 U.S.C. 1344).
2. Rivers and Harbors Act of 1899 Section 10 (33 U.S.C. 403 et seq.)
3. Environmental Protection Agency, Section 404(b)(1) Guidelines (40 CFR Part 230). Guidelines for Specification of Disposal Sites for Dredged or Fill Material.
4. Department of the Army, Section 404 Permit Regulations (33 CFR Parts 320-330). Policies for evaluating permit applications to discharge dredged or fill material.
5. 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 (February 6, 1990).
6. Title XII Food Security Act of 1985 as amended by the Food, Agriculture, Conservation and Trade Act of 1990 (16 U.S.C. 3801 et seq.).
7. National Environmental Policy Act (42 U.S.C. 4321 et seq.), including the Council on Environmental Quality's implementing regulations (40 CFR Parts 1500-1508).
8. Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.).
9. Fish and Wildlife Service Mitigation Policy (46 FR pages 7644- 7663, 1981).
10. Magnuson Fishery Conservation and Management Act (16 U.S.C. 1801 et seq.).
11. National Marine Fisheries Service Habitat Conservation Policy (48 FR pages 53142-53147, 1983).

The policies set out in this document are not final agency action, but are intended solely as guidance. The guidance is not intended, nor can it be relied upon, to create any rights enforceable by any party in litigation with the United States. This guidance does not establish or affect legal rights or obligations, establish a binding norm on any party and it is not finally determinative of the issues addressed. Any regulatory decisions made by the agencies in any particular matter addressed by this guidance will be made by applying the governing law and regulations to the relevant facts.

## B. Planning Considerations

### 1. Goal Setting

The overall goal of a mitigation bank is to provide economically efficient and flexible mitigation opportunities, while fully compensating for wetland and other aquatic resource losses in a manner that contributes to the long-term ecological functioning of the watershed within which the bank is to be located. The goal will include the need to replace essential aquatic functions which are anticipated to be lost through authorized activities within the bank's service area. In some cases, banks may also be used to address other resource objectives that have been identified in a watershed management plan or other resource assessment. It is desirable to set the particular objectives for a mitigation bank (i.e., the type and character of wetlands and/or aquatic resources to be established) in advance of site selection. The goal and objectives should be driven by the anticipated mitigation need; the site selected should support achieving the goal and objectives.

## 2. Site Selection

The agencies will give careful consideration to the ecological suitability of a site for achieving the goal and objectives of a bank, i.e., that it possess the physical, chemical and biological characteristics to support establishment of the desired aquatic resources and functions. Size and location of the site relative to other ecological features, hydrologic sources (including the availability of water rights), and compatibility with adjacent land uses and watershed management plans are important factors for consideration. It also is important that ecologically significant aquatic or upland resources (e.g., shallow sub-tidal habitat, mature forests), cultural sites, or habitat for Federally or State-listed threatened and endangered species are not compromised in the process of establishing a bank. Other significant factors for consideration include, but are not limited to, development trends (i.e., anticipated land use changes), habitat status and trends, local or regional goals for the restoration or protection of particular habitat types or functions (e.g., re-establishment of habitat corridors or habitat for species of concern), water quality and floodplain management goals, and the relative potential for chemical contamination of the wetlands and/ or other aquatic resources.

Banks may be sited on public or private lands. Cooperative arrangements between public and private entities to use public lands for mitigation banks may be acceptable. In some circumstances, it may be appropriate to site banks on Federal, state, tribal or locally-owned resource management areas (e.g., wildlife management areas, national or state forests, public parks, recreation areas). The siting of banks on such lands may be acceptable if the internal policies of the public agency allow use of its land for such purposes, and the public agency grants approval. Mitigation credits generated by banks of this nature should be based solely on those values in the bank that are supplemental to the public program(s) already planned or in place, that is, baseline values represented by existing or already planned public programs, including preservation value, should not be counted toward bank credits.

Similarly, Federally-funded wetland conservation projects undertaken via separate authority and for other purposes, such as the Wetlands Reserve Program, Farmer's Home Administration fee title transfers or conservation easements, and Partners for Wildlife Program, cannot be used for the purpose of generating credits within a mitigation bank. However, mitigation credit may be given for activities undertaken in conjunction with, but supplemental to, such programs in order to maximize the overall ecological benefit of the conservation project.

## 3. Technical Feasibility

Mitigation banks should be planned and designed to be self-sustaining over time to the extent possible. The techniques for establishing wetlands and/or other aquatic resources must be carefully selected, since this science is constantly evolving. The restoration of historic or substantially-degraded wetlands and/or other aquatic resources (e.g., prior-converted cropland, farmed wetlands) utilizing proven techniques increases the likelihood of success and typically does not result in the loss of other valuable resources. Thus, restoration should be the first option considered when siting a bank. Because of the difficulty in establishing the correct hydrologic conditions associated with many creation projects and the tradeoff in wetland functions involved with certain enhancement activities, these methods should only be considered where there are

adequate assurances to ensure success and that the project will result in an overall environmental benefit.

In general, banks which involve complex hydraulic engineering features and/or questionable water sources (e.g., pumped) are most costly to develop, operate and maintain, and have a higher risk of failure than banks designed to function with little or no human intervention. The former situations should only be considered where there are adequate assurances to ensure success. This guidance recognizes that in some circumstances wetlands must be actively managed to ensure their viability and sustainability. Furthermore, long-term maintenance requirements may be necessary and appropriate in some cases (e.g., to maintain fire-dependent plant communities in the absence of natural fire; to control invasive exotic plant species).

Proposed mitigation techniques should be well-understood and reliable. When uncertainties surrounding the technical feasibility of a proposed mitigation technique exist, appropriate arrangements (e.g., financial assurances, contingency plans, additional monitoring requirements) should be in place to increase the likelihood of success. Such arrangements may be phased-out or reduced once the attainment of prescribed performance standards is demonstrated.

#### 4. Role of Preservation

Credit 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. Such augmentation may be reflected in the total number of credits available from the bank.

In addition, the preservation of existing wetlands and/or other aquatic resources in perpetuity may be authorized as the sole basis for generating credits in mitigation banks only in exceptional circumstances, consistent with existing regulations, policies and guidance. Under such circumstances, preservation may be accomplished through the implementation of appropriate legal mechanisms (e.g., transfer of deed, deed restrictions, conservation easement) to protect wetlands and/or other aquatic resources, accompanied by implementation of appropriate changes in land use or other physical changes as necessary (e.g., installation of restrictive fencing).

Determining whether preservation is appropriate as the sole basis for generating credits at a mitigation bank requires careful judgment regarding a number of factors. Consideration must be given to whether wetlands and/or other aquatic resources proposed for preservation (1) perform physical or biological functions, the preservation of which is important to the region in which the aquatic resources are located, and (2) are under demonstrable threat of loss or substantial degradation due to human activities that might not otherwise be expected to be restricted. The existence of a demonstrable threat will be based on clear evidence of destructive land use changes which are consistent with local and regional land use trends and are not the consequence of actions under the control of the bank sponsor. Wetlands and other aquatic resources restored under the Conservation Reserve Program or similar programs requiring only temporary conservation easements may be eligible for banking credit upon termination of the original easement if the wetlands are provided permanent protection and it would otherwise be expected that the resources would be converted upon termination of the easement. The number of



mitigation credits available from a bank that is based solely on preservation should be based on the functions that would otherwise be lost or degraded if the aquatic resources were not preserved, and the timing of such loss or degradation. As such, compensation for aquatic resource impacts will typically require a greater number of acres from a preservation bank than from a bank which is based on restoration, creation or enhancement.

#### 5. Inclusion of Upland Areas

Credit may be given for the inclusion of upland areas occurring within a bank only to the degree that such features increase the overall ecological functioning of the bank. If such features are included as part of a bank, it is important that they receive the same protected status as the rest of the bank and be subject to the same operational procedures and requirements. The presence of upland areas may increase the per-unit value of the aquatic habitat in the bank. Alternatively, limited credit may be given to upland areas protected within the bank to reflect the functions inherently provided by such areas (e.g., nutrient and sediment filtration of stormwater runoff, wildlife habitat diversity) which directly enhance or maintain the integrity of the aquatic ecosystem and that might otherwise be subject to threat of loss or degradation. An appropriate functional assessment methodology should be used to determine the manner and extent to which such features augment the functions of restored, created or enhanced wetlands and/or other aquatic resources.

#### 6. Mitigation Banking and Watershed Planning

Mitigation banks should be planned and developed to address the specific resource needs of a particular watershed. Furthermore, decisions regarding the location, type of wetlands and/or other aquatic resources to be established, and proposed uses of a mitigation bank are most appropriately made within the context of a comprehensive watershed plan. Such watershed planning efforts often identify categories of activities having minimal adverse effects on the aquatic ecosystem and that, therefore, could be authorized under a general permit. In order to reduce the potential cumulative effects of such activities, it may be appropriate to offset these types of impacts through the use of a mitigation bank established in conjunction with a watershed plan.

#### C. Establishment of Mitigation Banks

##### 1. Prospectus

Prospective bank sponsors should first submit a prospectus to the Army Corps of Engineers (Corps) or Natural Resources Conservation Service (NRCS)\1\ to initiate the planning and review process by the appropriate agencies. Prior to submitting a prospectus, bank sponsors are encouraged to discuss their proposal with the appropriate agencies (e.g., pre-application coordination).

\1\ The Corps will typically serve as the lead agency for the establishment of mitigation banks. Bank sponsors proposing establishment of mitigation banks solely for the purpose of complying with the "Swampbuster" provisions of FSA should submit their prospectus to the NRCS.

It is the intent of the agencies to provide practical comments to the bank sponsors regarding the general need for and technical feasibility of proposed banks. Therefore, bank sponsors are encouraged to include in the prospectus sufficient information concerning the objectives for the bank and how it will be established and operated to allow the agencies to provide such feedback. Formal agency involvement and review is initiated with submittal of a prospectus.

## 2. Mitigation Banking Instruments

Information provided in the prospectus will serve as the basis for establishing the mitigation banking instrument. All mitigation banks need to have a banking instrument as documentation of agency concurrence on the objectives and administration of the bank. The banking instrument should describe in detail the physical and legal characteristics of the bank, and how the bank will be established and operated. For regional banking programs sponsored by a single entity (e.g., a state transportation agency), it may be appropriate to establish an "umbrella" instrument for the establishment and operation of multiple bank sites. In such circumstances, the need for supplemental site-specific information (e.g., individual site plans) should be addressed in the banking instrument. The banking instrument will be signed by the bank sponsor and the concurring regulatory and resource agencies represented on the Mitigation Bank Review Team (section II.C.2). The following information should be addressed, as appropriate, within the banking instrument:

- a. Bank goals and objectives;
- b. Ownership of bank lands;
- c. Bank size and classes of wetlands and/or other aquatic resources proposed for inclusion in the bank, including a site plan and specifications;
- d. Description of baseline conditions at the bank site;
- e. Geographic service area;
- f. Wetland classes or other aquatic resource impacts suitable for compensation;
- g. Methods for determining credits and debits;
- h. accounting procedures;
- i. Performance standards for determining credit availability and bank success;
- j. Reporting protocols and monitoring plan;
- k. Contingency and remedial actions and responsibilities;
- l. Financial assurances;
- m. Compensation ratios;
- n. Provisions for long-term management and maintenance.

The terms and conditions of the banking instrument may be amended, in accordance with the procedures used to establish the instrument and subject to agreement by the signatories.

In cases where initial establishment of the mitigation bank involves a discharge into waters of the United States requiring Section 10/404 authorization, the banking instrument will be made part of a Department of the Army permit for that discharge. Submittal of an individual permit application should be accompanied by a sufficiently-detailed prospectus to allow for concurrent processing of each. Preparation of a banking instrument, however, should not alter the normal permit evaluation process timeframes. A bank sponsor may proceed with activities for the construction of a bank

subsequent to receiving the Department of the Army authorization. It should be noted, however, that a bank sponsor who proceeds in the absence of a banking instrument does so at his/her own risk. In cases where the mitigation bank is established pursuant to the FSA, the banking instrument will be included in the plan developed or approved by NRCS and the Fish and Wildlife Service (FWS).

### 3. Agency Roles and Coordination

Collectively, the signatory agencies to the banking instrument will comprise the Mitigation Bank Review Team (MBRT). Representatives from the Corps, EPA, FWS, National Marine Fisheries Service (NMFS) and NRCS, as appropriate given the projected use for the bank, should typically comprise the MBRT. In addition, it is appropriate for representatives from state, tribal and local regulatory and resource agencies to participate where an agency has authorities and/or mandates directly affecting or affected by the establishment, use or operation of a bank. No agency is required to sign a banking instrument; however, in signing a banking instrument, an agency agrees to the terms of that instrument. The Corps will serve as Chair of the MBRT, except in cases where the bank is proposed solely for the purpose of complying with the FSA, in which case NRCS will be the MBRT Chair. In addition, where a bank is proposed to satisfy the requirements of another Federal, state, tribal or local program, it may be appropriate for the administering agency to serve as co-Chair of the MBRT. The primary role of the MBRT is to facilitate the establishment of mitigation banks through the development of mitigation banking instruments. Because of the different authorities and responsibilities of each agency represented on the MBRT, there is a benefit in achieving agreement on the banking instrument. For this reason, the MBRT will strive to obtain consensus on its actions. The Chair of the MBRT will have the responsibility for making final decisions regarding the terms and conditions of the banking instrument where consensus cannot otherwise be reached within a reasonable timeframe (e.g., 90 days from the date of submittal of a complete prospectus). The MBRT will review and seek consensus on the banking instrument and final plans for the restoration, creation, enhancement, and/or preservation of wetlands and other aquatic resources. Consistent with its authorities under Section 10/404, the Corps is responsible for authorizing use of a particular mitigation bank on a project-specific basis and determining the number and availability of credits required to compensate for proposed impacts in accordance with the terms of the banking instrument. Decisions rendered by the Corps must fully consider review agency comments submitted as part of the permit evaluation process. Similarly, the NRCS, in consultation with the FWS, will make the final decision pertaining to the withdrawal of credits from banks as appropriate mitigation pursuant to FSA.

### 4. Role of the Bank Sponsor

The bank sponsor is responsible for the preparation of the banking instrument in consultation with the MBRT. The bank sponsor should, therefore, have sufficient opportunity to discuss the content of the banking instrument with the MBRT. The bank sponsor is also responsible for the overall operation and management of the bank in accordance with the terms of the banking instrument, including the preparation and distribution of monitoring reports and accounting statements/ledger, as necessary.

### 5. Public Review and Comment

The public should be notified of and have an opportunity to comment on all bank proposals. For banks which require authorization under an individual Section 10/404 permit or a state, tribal or local program that involves a similar public notice and comment process, this condition will typically be satisfied through such standard procedures. For other proposals, the Corps or NRCS, upon receipt of a complete banking prospectus, should provide notification of the availability of the prospectus for a minimum 21-day public comment period. Notification procedures will be similar to those used by the Corps in the standard permit review process. Copies of all public comments received will be distributed to the other members of the MBRT and the bank sponsor for full consideration in the development of the final banking instrument.

#### 6. Dispute Resolution Procedure

The MBRT will work to reach consensus on its actions in accordance with this guidance. It is anticipated that all issues will be resolved by the MBRT in this manner.

##### a. Development of the Banking Instrument

During the development of the banking instrument, if any agency representative considers that a particular decision raises concern regarding the application of existing policy or procedures, an agency may request, through written notification, that the issue be reviewed by the Corps District Engineer, or NRCS State Conservationist, as appropriate. Said notification will describe the issue in sufficient detail and provide recommendations for resolution. Within 20 days, the District Engineer or State Conservationist (as appropriate) will consult with the notifying agency(ies) and will resolve the issue. The resolution will be forwarded to the other MBRT member agencies. The bank sponsor may also request the District Engineer or State Conservationist review actions taken to develop the banking instrument if the sponsor believes that inadequate progress has been made on the instrument by the MBRT.

##### b. Application of the Banking Instrument

As previously stated, the Corps and NRCS are responsible for making final decisions on a project-specific basis regarding the use of a mitigation bank for purposes of Section 10/404 and FSA, respectively. In the event an agency on the MBRT is concerned that a proposed use may be inconsistent with the terms of the banking instrument, that agency may raise the issue to the attention of the Corps or NRCS through the permit evaluation process. In order to facilitate timely and effective consideration of agency comments, the Corps or NRCS, as appropriate, will advise the MBRT agencies of a proposed use of a bank. The Corps will fully consider comments provided by the review agencies regarding mitigation as part of the permit evaluation process. The NRCS will consult with FWA is making its decisions pertaining to mitigation.

If, in the view of an agency on the MBRT, an issued permit or series of permits reflects a pattern of concern regarding the application of the terms of the banking instrument, that agency may initiate review of the concern by the full MBRT through written notification to the MBRT Chair. The MBRT Chair will convene a meeting of the MBRT, or initiate another appropriate forum for communication, typically within 20 days of receipt of notification, to resolve concerns. Any such

effort to address concerns regarding the application of a banking instrument will not delay any decision pending before the authorizing agency (e.g., Corps or NRCS).

#### D. Criteria for Use of a Mitigation Bank

##### 1. Project Applicability

All activities regulated under Section 10/404 may be eligible to use a mitigation bank as compensation for unavoidable impacts to wetlands and/or other aquatic resources. Mitigation banks established for FSA purposes may be debited only in accordance with the mitigation and replacement provisions of 7 CFR Part 12.

Credits from mitigation banks may also be used to compensate for environmental impacts authorized under other programs (e.g., state or local wetland regulatory programs, NPDES program, Corps civil works projects, Superfund removal and remedial actions). In no case may the same credits be used to compensate for more than one activity; however, the same credits may be used to compensate for an activity which requires authorization under more than one program.

##### 2. Relationship to Mitigation Requirements

Under the existing requirements of Section 10/404, all appropriate and practicable steps must be undertaken by the applicant to first avoid and then minimize adverse impacts to aquatic resources, prior to authorization to use a particular mitigation bank. Remaining unavoidable impacts must be compensated to the extent appropriate and practicable. For both the Section 10/404 and “Swampbuster” programs, requirements for compensatory mitigation may be satisfied through the use of mitigation banks when either on-site compensation is not practicable or use of the mitigation bank is environmentally preferable to on-site compensation.

It is important to emphasize that applicants should not expect that establishment of, or purchasing credits from, a mitigation bank will necessarily lead to a determination of compliance with applicable mitigation requirements (i.e., Section 404(b)(1) Guidelines or FSA Manual), or as excepting projects from any applicable requirements.

##### 3. Geographic Limits of Applicability

The service area of a mitigation bank is the 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. This area should be designated in the banking instrument. Designation of the service area should be based on consideration of hydrologic and biotic criteria, and be stipulated in the banking instrument. Use of a mitigation bank to compensate for impacts beyond the designated service area may be authorized, on a case-by-case basis, where it is determined to be practicable and environmentally desirable. The geographic extent of a service area should, to the extent environmentally desirable, be guided by the cataloging unit of the “Hydrologic Unit map of the United States” (USGS, 1980) and the ecoregion of the “Ecoregions of the United States” (James M. Omernik, EPA, 1986) or section of the “Descriptions of the Ecoregions of the United States” (Robert G. Bailey, USDA, 1980). It may be appropriate to use other classification systems

developed at the state or regional level for the purpose of specifying bank service areas, when such systems compare favorably in their objectives and level of detail. In the interest of the integrating banks with other resource management objectives, bank service areas may encompass larger watershed areas if the designation of such areas is supported by local or regional management plans (e.g., Special Area Management Plans, Advance Identification), State Wetland Conservation Plans or other Federally sponsored or recognized resource management plans. Furthermore, designation of a more inclusive service area may be appropriate for mitigation banks whose primary purpose is to compensate for linear projects that typically involve numerous small impacts in several different watersheds.

#### 4. Use of a Mitigation Bank vs. On-Site Mitigation

The agencies' preference for on-site mitigation, indicated in the 1990 Memorandum of Agreement on mitigation between the EPA and the Department of the Army, should not preclude the use of a mitigation bank when there is no practicable opportunity for on-site compensation, or when use of a bank is environmentally preferable to on-site compensation. On-site mitigation may be preferable where there is a practicable opportunity to compensate for important local functions including local flood control functions, habitat for a species or population with a very limited geographic range or narrow environmental requirements, or where local water quality concerns dominate. In choosing between on-site mitigation and use of a mitigation bank, careful consideration should be given to the likelihood for successfully establishing the desired habitat type, the compatibility of the mitigation project with adjacent land uses, and the practicability of long-term monitoring and maintenance to determine whether the effort will be ecologically sustainable, as well as the relative cost of mitigation alternatives. 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. With respect to larger aquatic resource impacts, use of a bank may be appropriate if it is capable of replacing essential physical and/or biological functions of the aquatic resources which are expected to be lost or degraded. Finally, there may be circumstances warranting a combination of on-site and off-site mitigation to compensate for losses.

#### 5. In-kind vs. Out-of-kind Mitigation Determinations

In the interest of achieving functional replacement, in-kind compensation of aquatic resource impacts should generally be required. Out-of-kind compensation may be acceptable if it is determined to be practicable and environmentally preferable to in-kind compensation (e.g., of greater ecological value to a particular region). However, non-tidal wetlands should typically not be used to compensate for the loss or degradation of tidal wetlands. Decisions regarding out-of-kind mitigation are typically made on a case-by-case basis during the permit evaluation process. The banking instrument may identify circumstances in which it is environmentally desirable to allow out-of-kind compensation within the context of a particular mitigation bank (e.g., for banks restoring a complex of associated wetland types). Mitigation banks developed as part of an area-wide management plan to address a specific resource objective (e.g., restoration of a particularly vulnerable or valuable wetland habitat type) may be such an example.

#### 6. Timing of Credit Withdrawal

The number of credits available for withdrawal (i.e., debiting) should generally be commensurate with the level of aquatic functions attained at a bank at the time of debiting. The level of function may be determined through the application of performance standards tailored to the specific restoration, creation or enhancement activity at the bank site or through the use of an appropriate functional assessment methodology. The success of a mitigation bank with regard to its capacity to establish a healthy and fully functional aquatic system relates directly to both the ecological and financial stability of the bank. Since financial considerations are particularly critical in early stages of bank development, it is generally appropriate, in cases where there is adequate financial assurance and where the likelihood of the success of the bank is high, to allow limited debiting of a percentage of the total credits projected for the bank at maturity. Such determinations should take into consideration the initial capital costs needed to establish the bank, and the likelihood of its success. However, it is the intent of this policy to ensure that those actions necessary for the long-term viability of a mitigation bank be accomplished prior to any debiting of the bank. In this regard, the following minimum requirements should be satisfied prior to debiting: (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 improvements should be completed no later than the first full growing season following initial debiting of a bank. The temporal loss of functions associated with the debiting of projected credits may justify the need for requiring higher compensation ratios in such cases. For mitigation banks which propose multiple-phased construction, similar conditions should be established for each phase.

Credits attributed to the preservation of existing aquatic resources may become available for debiting immediately upon implementation of appropriate legal protection accompanied by appropriate changes in land use or other physical changes, as necessary.

#### 7. Crediting/Debiting/Accounting Procedures

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. Credits are debited from a bank when they are used to offset aquatic resource impacts (e.g. for the purpose of satisfying Section 10/404 permit or FSA requirements).

An appropriate functional assessment methodology (e.g., Habitat Evaluation Procedures, hydrogeomorphic approach to wetlands functional assessment, other regional assessment methodology) acceptable to all signatories should be used to assess wetland and/or other aquatic resource restoration, creation and enhancement activities within a mitigation bank, and to quantify the amount of available credits. The range of functions to be assessed will depend upon the assessment methodology identified in the banking instrument. The same methodology should be used to assess both credits and debits. If an appropriate functional assessment methodology is impractical to employ, acreage may be used as a surrogate for measuring function. Regardless of the method employed, the number of credits should reflect the difference between site conditions under the with-and without-bank scenarios.

The bank sponsor should be responsible for assessing the development of the bank and submitting appropriate documentation of such assessments to the authorizing agency(ies), who will distribute the documents to the other members of the MBRT for review. Members of the MBRT are encouraged to conduct regular (e.g., annual) on-site inspections, as appropriate, to monitor bank performance. Alternatively, functional assessments may be conducted by a team representing involved resources and regularly agencies and other appropriate parties. The number of available credits in a mitigation bank may need to be adjusted to reflect actual conditions.

The banking instrument should require that bank sponsors establish and maintain an accounting system (i.e., ledger) which documents the activity of all mitigation bank accounts. Each time an approved debit/ credit transaction occurs at a given bank, the bank sponsor should submit a statement to the authorizing agency(ies). The bank sponsor should also generate an annual ledger report for all mitigation bank accounts to be submitted to the MBRT Chair for distribution to each member of the MBRT.

Credits may be sold to third parties. The cost of mitigation credits to a third party is determined by the bank sponsor.

#### Party Responsible for Bank Success

The bank sponsor is responsible for assuring the success of the debited restoration, creation, enhancement and preservation activities at the mitigation bank, and it is therefore extremely important that an enforceable mechanism be adopted establishing the responsibility of the bank sponsor to develop and operate the bank properly. Where authorization under Section 10/404 and/or FSA is necessary to establish the bank, the Department of the Army permit or NRCS plan should be conditioned to ensure that provisions of the banking instrument are enforceable by the appropriate agency(ies). In circumstances where establishment of a bank does not require such authorization, the details of the bank sponsor's responsibilities should be delineated by the relevant authorizing agency (e.g., the Corps in the case of Section 10/404 permits) in any permit in which the permittee's mitigation obligations are met through use of the bank. In addition, the bank sponsor should sign such permits for the limited purpose of meeting those mitigation responsibilities, thus confirming that those responsibilities are enforceable against the bank sponsor if necessary.

### E. Long-Term Management, Monitoring and Remediation

#### 1. Bank Operational Life

The operational life of a bank refers to the period during which the terms and conditions of the banking instrument are in effect. With the exception of arrangements for the long-term management and protection in perpetuity of the wetlands and/or other aquatic resources, the operational life of a mitigation bank terminates at the point when (1) Compensatory mitigation credits have been exhausted or banking activity is voluntarily terminated with written notice by the bank sponsor provided to the Corps or NRCS and other members of the MBRT, and (2) it has been determined that the debited bank is functionally mature and/or self-sustaining to the degree specified in the banking instrument.



## 2. Long-term Management and Protection

The wetlands and/or other aquatic resources in a mitigation bank should be protected in perpetuity with appropriate real estate arrangements (e.g., conservation easements, transfer of title to Federal or State resource agency or non-profit conservation organization). Such arrangements should effectively restrict harmful activities (i.e., incompatible uses \2\)) that might otherwise jeopardize the purpose of the bank. In exceptional circumstances, real estate arrangements may be approved which dictate finite protection for a bank (e.g., for coastal protection projects which prolong the ecological viability of the aquatic system). However, in no case should finite protection extend for a lesser time than the duration of project impacts for which the bank is being used to provide compensation.

\2\ For example, certain silvicultural practices (e.g. clear cutting and/or harvests on short-term rotations) may be incompatible with the objectives of a mitigation bank. In contrast, silvicultural practices such as long-term rotations, selective cutting, maintenance of vegetation diversity, and undisturbed buffers are more likely to be considered a compatible use.

The bank sponsor is responsible for securing adequate funds for the operation and maintenance of the bank during its operational life, as well as for the long-term management of the wetlands and/or other aquatic resources, as necessary. The banking instrument should identify the entity responsible for the ownership and long-term management of the wetlands and/or other aquatic resources. Where needed, the acquisition and protection of water rights should be secured by the bank sponsor and documented in the banking instrument.

## 3. Monitoring Requirements

The bank sponsor is responsible for monitoring the mitigation bank in accordance with monitoring provisions identified in the banking instrument to determine the level of success and identify problems requiring remedial action. Monitoring provisions should be set forth in the banking instrument and based on scientifically sound performance standards prescribed for the bank. monitoring should be conducted at time intervals appropriate for the particular project type and until such time that the authorizing agency(ies), in consultation with the MBRT, are confident that success is being achieved (i.e., performance standards are attained). The period for monitoring will typically be five years; however, it may be necessary to extend this period for projects requiring more time to reach a stable condition (e.g., forested wetlands) or where remedial activities were undertaken. Annual monitoring reports should be submitted to the authorizing agency(ies), who is responsible for distribution to the other members of the MBRT, in accordance with the terms specified in the banking instrument.

## 4. Remedial Action

The banking instrument should stipulate the general procedures for identifying and implementing remedial measures at a bank, or any portion thereof. 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.

## 5. Financial Assurances

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. Accordingly, banks posing a greater risk of failure and where credits have been debited, should have comparatively higher financial sureties in place, than those where the likelihood of success is more certain. In addition, the bank sponsor is responsible for securing adequate funding to monitor and maintain the bank throughout its operational life, as well as beyond the operational life if not self-sustaining. Total funding requirements should reflect realistic cost estimates for monitoring, long-term maintenance, contingency and remedial actions.

Financial assurances may be in the form of performance bonds, irrevocable trusts, escrow accounts, casualty insurance, letters of credit, legislatively-enacted dedicated funds for government operate banks or other approved instruments. Such 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).

## F. Other Considerations

### 1. In-lieu-fee Mitigation Arrangements

For purposes of this guidance, in-lieu-fee, fee mitigation, or other similar arrangements, wherein funds are paid to a natural resource management entity for implementation of either specific or general wetland or other aquatic resource development projects, are not considered to meet the definition of mitigation banking because they do not typically provide compensatory mitigation in advance of project impacts. Moreover, such arrangements do not typically provide a clear timetable for the initiation of mitigation efforts. The Corps, in consultation with the other agencies, may find there are circumstances where such arrangements are appropriate so long as they meet the requirements that would otherwise apply to an offsite, prospective mitigation effort and provides adequate assurances of success and timely implementation. In such cases, a formal agreement between the sponsor and the agencies, similar to a banking instrument, is necessary to define the conditions under which its use is considered appropriate.

### 2. Special Considerations for “Swampbuster”

Current FSA legislation limits the extent to which mitigation banking can be used for FSA purposes. Therefore, if a mitigation bank is to be used for FSA purposes, it must meet the requirements of FSA.

## III. Definitions

For the purposes of this guidance document the following terms are defined:

A. Authorizing agency. Any Federal, state, tribal or local agency that has authorized a particular use of a mitigation bank as compensation for an authorized activity; the authorizing agency will typically have the enforcement authority to ensure that the terms and conditions of the banking instrument are satisfied.

B. Bank sponsor. Any public or private entity responsible for establishing and, in most circumstances, operating a mitigation bank.

C. Compensatory mitigation. For purposes of Section 10/404, compensatory mitigation is the restoration, creation, enhancement, or in exceptional circumstances, preservation of wetlands and/or other aquatic resources for the purpose of compensating for unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved.

D. Consensus. The term consensus, as defined herein, is a process by which a group synthesizes its concerns and ideas to form a common collaborative agreement acceptable to all members. While the primary goal of consensus is to reach agreement on an issue by all parties, unanimity may not always be possible.

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

F. Credit. A unit of measure representing the accrual or attainment of aquatic functions at a mitigation bank; the measure of function is typically indexed to the number of wetland acres restored, created, enhanced or preserved.

G. Debit. A unit of measure representing the loss of aquatic functions at an impact or project site.

H. Enhancement. Activities conducted in existing wetlands or other aquatic resources which increase one or more aquatic functions.

I. Mitigation. For purposes of Section 10/404 and consistent with the Council on Environmental Quality regulations, the Section 404(b)(1) Guidelines and the 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, mitigation means sequentially avoiding impacts, minimizing impacts, and compensating for remaining unavoidable impacts.

J. Mitigation bank. A mitigation bank is a site where wetlands and/ or other aquatic resources are restored, created, enhanced, or in exceptional circumstances, preserved expressly for the purpose of providing compensatory mitigation in advance of authorized impacts to similar resources. For purposes of Section 10/404, use of a mitigation bank may only be authorized when impacts are unavoidable.

K. Mitigation Bank Review Team (MBRT). 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.

L. Practicable. Available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

M. 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.

N. 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 a substantially degraded state.

O. Service area. 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.

John H. Zirschky,  
Acting Assistant Secretary (Civil Works),  
Department of the Army.

Robert Perciasepe,  
Assistant Administrator for Water,  
Environmental Protection Agency.

Thomas R. Hebert,  
Acting Undersecretary for Natural Resources and Environment,  
Department of Agriculture.

Robert P. Davison,  
Acting Assistant Secretary for Fish and Wildlife and Parks,  
Department of the Interior.

Douglas K. Hall,  
Assistant Secretary for Oceans and Atmosphere,  
Department of Commerce.

[FR Doc. 95-28907 Filed 11-27-95; 8:45 am]  
BILLING CODE 3710-92-M

**APPENDIX F – STANDARD MITIGATION BANK  
MEMORANDUM OF AGREEMENT**

\_\_\_\_\_ **WETLAND MITIGATION BANK**  
\_\_\_\_\_, Oregon

**MEMORANDUM OF AGREEMENT**

**TO**

**ESTABLISH A WETLAND MITIGATION BANK**

**BETWEEN**

\_\_\_\_\_, Sponsor

**AND**

**U.S. ARMY CORPS OF ENGINEERS, PORTLAND DISTRICT  
OREGON DIVISION OF STATE LANDS  
U.S. ENVIRONMENTAL PROTECTION AGENCY  
U.S. FISH AND WILDLIFE SERVICE  
OREGON DEPARTMENT OF FISH AND WILDLIFE  
OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY  
OREGON DEPARTMENT OF LAND CONSERVATION AND DEVELOPMENT  
(local planning dept, SWCD or other entity)**

\_\_\_\_\_ MITIGATION BANK

**Memorandum of Agreement**

**INTRODUCTION**

The parties to this Memorandum of Agreement (the "Agreement") have participated in the development of the Mitigation Banking Instrument (the "Instrument") for the \_\_\_\_\_ Wetland Mitigation Bank. The Instrument, dated \_\_\_\_\_, 200\_ contains the details of the mitigation site plan, goals, objectives, performance standards, monitoring and contingency plans, and reference site. By signing this Agreement, the parties approve the Instrument and the mitigation site plan described within it. This Agreement relies upon and supplements the commitments expressed by the bank sponsors in the Instrument.

**1. PURPOSE OF THE BANK**

The purpose of the bank is to provide compensatory wetland mitigation for anticipated losses to wetland functions and values resulting from activities authorized by permit from the U.S. Army Corps of Engineers ("the Corps") under Section 404 of the Clean Water Act and/or from Oregon Division of State Lands (DSL) under the State Removal-Fill Law. The bank will provide compensatory mitigation for impacts to \_\_\_\_\_ (insert wetland types) \_\_\_\_\_ wetlands within the service area.

**2. GOALS**

The goals of the bank are: \_\_\_\_\_.

**3. MITIGATION BANK SITE**

The mitigation bank site is located \_\_\_\_\_.

**4. SERVICE AREA**

The bank's service area is \_\_\_\_\_ (see Instrument, Figure \_\_\_\_\_).

**5. PERFORMANCE STANDARDS**

The performance standards for the mitigation plan are stated in the Instrument (state where the standards are located in the instrument).

**6. MONITORING AND CONTINGENCY PLANS**

Monitoring and contingency plans are stated in the Instrument (state where the monitoring and contingency plans are located in the instrument).

The bank sponsor acknowledges its responsibility for completing the necessary actions to ensure success of any required remediation to correct failures to meet mitigation performance standards, and will provide the necessary financial assurances to allow the Corps and DSL to undertake any such measures which the sponsors fail or unable to implement. (state the nature of the financial assurances).

## **7. CREDITS**

Completion of the work described in the mitigation site plan as stated in the Instrument will result in the establishment of \_\_\_\_\_ credits. These credits will become available for sale by the bank once they are certified in writing by the Corps and DSL. Certification of these credits is dependent upon evidence to be provided by the bank sponsors that the completed work meets the performance standards stated in the Instrument. Credits may be certified in increments if the performance standards have not been fully met and substantial progress toward meeting the standards is evident.

Subject to written approval by the Corps and DSL, up to 30 percent of the total credits may be sold in advance of certification provided that site grading as described in the Instrument in Section \_\_\_\_ has been completed. Approval of advance sale of credits will be dependent on evidence provided by the bank sponsors that this requirement has been met. The Corps and DSL will determine the percentage of total credits which may be sold in advance of certification.

In the event of catastrophic acts of nature, such as but not limited to earthquakes, drought, and volcanic activity, which interfere with the sponsors' ability to fulfill the terms of this Agreement and the Instrument, no further credits will be sold unless remediation of the mitigation site is accomplished. Proposed remediation measures are subject to prior approval by the Corps and DSL with the advice of other parties to this Agreement.

## **8. REPORTS**

Monitoring reports will be prepared annually until five years after the sale of the last remaining whole or partial mitigation bank credit. The annual monitoring reports will be submitted to the Corps and DSL in \_\_\_\_\_ of each year. These reports will address progress toward meeting the performance standards and any remedies taken to correct deficiencies that occurred in meeting the standards.

Reports of credits earned, sold and remaining will be prepared annually and submitted to the Corps and DSL along with the monitoring reports. In addition, the Corps and DSL will be notified of each individual credit sale at the time that it occurs, including a copy of the transaction document.

## **9. EFFECTIVE DATE AND MODIFICATION**

This Agreement will become effective when all of the following conditions are met:

1. This Agreement is signed by the bank sponsors, the Corps and DSL;
2. \_\_\_\_\_ (Financial assurances are established) \_\_\_\_\_;

3. A deed restriction or conservation agreement with terms mutually agreeable to the sponsors, the Corps and DSL is signed by the owners of the mitigation bank site and is recorded in the records of \_\_\_\_\_ County.

This Agreement will terminate five years after the date the last remaining whole or partial credit is sold by the bank. This Agreement may be terminated earlier only by written agreement signed by the sponsors, the Corps and DSL, after having sought the advice of the Mitigation Bank Review Team.

This Agreement may be amended only by written agreement signed by the sponsors, the Corps and DSL, after having sought the advice of the Mitigation Bank Review Team.

## **10. OBLIGATIONS OF THE PARTIES**

Sponsors: The bank sponsors are responsible for implementation, maintenance and remediation of the mitigation site plan as detailed in the Instrument, including but not limited to ensuring the success of the wetland restoration and creation work; reporting the results of annual monitoring of the mitigation site; managing and reporting credit sales and balances; complying with the requirements of local zoning ordinances and land use plans; obtaining any required water rights; and all other requirements of the Instrument.

Authorizing Agencies: The Corps and DSL are responsible for determining when and if credits can be certified and made available for sale; review of all reports submitted by the bank sponsor as required by this Agreement; determining the adequacy of the mitigation site work, the need for remedial measures, and the adequacy of completed remedial measures; undertaking remedial measures when and if the bank sponsors fail to implement the required measures using funds made available by the sponsor through the letter of credit; and for determining when and if mitigation bank credits can be used by permit applicants to satisfy the compensatory mitigation requirements of individual permits. The Corps and DSL will seek the advice of the members of the Mitigation Bank Review Team, composed of the other parties to this agreement, before making the decisions required by this Agreement.

Other Parties: All other parties, by signing this Agreement, accept the terms of this Agreement and the Instrument. These parties constitute the Mitigation Bank Review Team, with the Corps and DSL as co-chairs, and will review all annual reports submitted by the bank sponsor, will participate in meetings and site visits to review the success and operation of the bank, and will advise the Corps and DSL in making decisions required by this Agreement.



**11. SIGNATURES**

**Bank Sponsor(s):**

\_\_\_\_\_  
(Sponsor)

**Authorizing Agencies:**

\_\_\_\_\_  
Colonel, Corps of Engineers  
District Engineer  
Portland District

\_\_\_\_\_  
Director  
Oregon Division of State Lands

**Other Parties**

\_\_\_\_\_  
U.S. Environmental Protection Agency  
Region 10

\_\_\_\_\_  
U.S. Fish and Wildlife Service  
Oregon State Office

\_\_\_\_\_  
Oregon Department of Fish and Wildlife

\_\_\_\_\_  
Oregon Department of Environmental Quality

\_\_\_\_\_  
Oregon Department of Land Conservation  
and Development

\_\_\_\_\_  
(Local planning department, SWCD, or  
other local entity)

