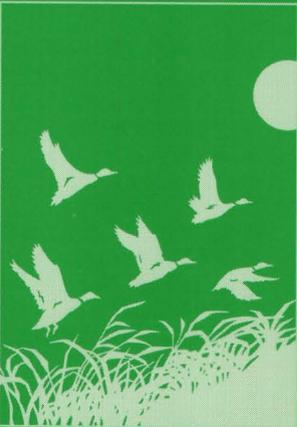
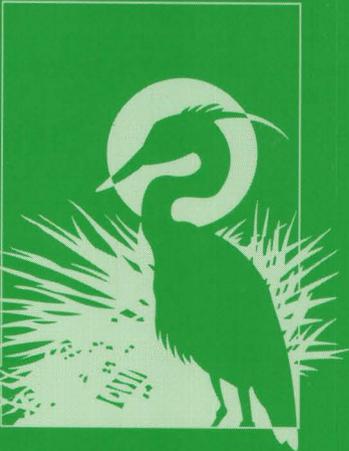




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National Wetland Mitigation Banking Study

Commercial Wetland Mitigation Credit Ventures: *1995 National Survey*

National Wetland Mitigation Banking Study

This report is part of a series of reports that are being published during the National Wetland Mitigation Banking Study. Among the reports already published, in addition to this report include:

Wetlands Mitigation Banking Concepts IWR Report 92-WMB-1, July 1992, prepared by Richard Reppert, Institute for Water Resources. This report provides general background information and concepts pertaining to wetland mitigation banking.

Wetlands Mitigation Banking: Resource Document IWR Report 94-WMB-2, January 1994, prepared by the Institute for Water Resources and the Environmental Law Institute. This report presents detailed case study histories and an annotated wetland mitigation banking bibliography.

Expanding Opportunities for Compensatory Mitigation: The Private Credit Market Alternative IWR Report 94-WMB-3, January 1994, prepared by Leonard Shabman, Dennis King, and Paul Scodari. This study looks at economic forces affecting markets for mitigation credits.

First Phase Report IWR Report 94-WMB-4, January 1994, prepared by Robert Brumbaugh and Richard Reppert, Institute for Water Resources. Presents findings of phase one of the National Study.

Examination of Wetland Programs: Opportunities for Compensatory Mitigation IWR Report 94-WMB-5, March 1994, prepared by Apogee Research, Inc. Sixty-eight programs that conduct or facilitate wetland restoration or creation were identified that might be applicable to compensatory wetland mitigation. Fourteen programs were profiled in more detail.

Wetland Mitigation Banking IWR Report 94-WMB-6, February 1994, prepared by the Environmental Law Institute (ELI). The U.S. EPA and IWR co-funded this report that examines wetland mitigation banking experience in detail. (This is a very slight revision of a report published by ELI in 1993).

Commercial Wetland Mitigation Credit Markets: Theory and Practice IWR Report 95-WMB-7, November 1995, prepared by Paul Scodari, Leonard Shabman, and David White. This report examines existing and proposed commercial ventures (e.g., wetland mitigation banks) and area-wide and watershed rules governing the operation of commercial credit markets.

Watershed-based Wetlands Planning: A Case Study Report IWR Report 95-WMB-8, December 1995, prepared by David White and Leonard Shabman. The case studies of watershed-based wetlands planning illustrate a range of planning approaches and issues important to consider when undertaking watershed-based planning.

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*NATIONAL WETLAND MITIGATION
BANKING STUDY
Commercial Wetland Mitigation
Credit Ventures: 1995 National Survey*

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EXECUTIVE SUMMARY

Federal wetland regulations pursuant to Section 404 of the Clean Water Act (CWA) require applicants for wetland discharge permits to satisfy "mitigation sequencing" rules as a precondition for permitting. Mitigation sequencing requires permit applicants to first avoid and minimize wetland impacts to the extent practicable, and then provide compensatory mitigation for any remaining wetland impacts. Compensation is expected in the form of wetlands created from uplands, the restoration of former or severely degraded wetlands, or the enhancement of functioning wetlands.

While Federal wetland regulations state a preference for mitigation to be constructed at or contiguous to the site of the permitted discharge, in recent years regulators have increasingly allowed permittees to proceed with required mitigation "off-site." One form of off-site mitigation is *mitigation banking*. Mitigation banks are typically large areas of replacement wetlands created for the express purpose of providing compensatory mitigation for more than one wetland development project. Most of the mitigation banks currently in operation were each developed by a single large public or private entity to provide only for its own mitigation needs. In recent years, however, interest in mitigation banking has shifted from such "single-user" mitigation banking to commercial mitigation banking. Many recent arrangements proposed and established involve commercial ventures developed by private entrepreneurs, non-profit entities, and public agencies to create mitigation credits (some measure of wetland area and functioning) for sale to the general universe of permit applicants in need of compensatory mitigation. These commercial operations include the so-called "in-lieu fee systems" in which regulators have allowed permit applicants to pay a

mitigation fee to a third party in lieu of the direct provision of compensatory mitigation. This report refers to all such commercial mitigation operations as commercial *credit ventures*, and the sale of mitigation credits from credit ventures to applicants for CWA Section 404 permits is termed *commercial credit trading*. The distinguishing feature of this mitigation option is that the approved sale and use of mitigation credits transfers legal and financial responsibility for the fulfillment of mitigation requirements from permittees to credit ventures.

Over the last few years, this regulatory innovation has been advancing steadily in many areas of the country. In the summer of 1995, the U.S. Army Corps of Engineers, Institute for Water Resources (IWR), asked the various Corps District regulatory offices to provide information on operating and prospective commercial credit ventures in their respective areas. The survey was conducted as part of IWR's *National Wetland Mitigation Banking Study*.

This report presents the results of the nationwide survey of commercial credit ventures and credit trading within the CWA Section 404 program and includes information gathered in follow-up contacts with Corps District regulators and the sponsors of operating credit ventures. In the summer of 1995, 77 ventures were identified that meet the definition of commercial credit ventures used here. Of these 77 ventures, 24 were in operation; the others reflect prospective ventures that were either proposed or in planning at that time. Of the 11 Corps Divisions, the South Atlantic Division has seen the most activity in terms of commercial credit supply, with a total of 23 operating and prospective ventures. Six of the

Executive Summary

ventures in the South Atlantic Division were in operation.

The survey results suggest that a very large share of the nationwide development of this regulatory innovation is occurring in areas of the country for which regional guidance or rules for commercial credit trading have been developed. For example, Maryland, Florida, and Minnesota have developed state rules for commercial credit trading. Similarly, various Corps Districts, including the Chicago and Galveston Districts, have developed regulatory guidance for their respective jurisdictions. More than one-third of all operating and prospective ventures identified by the survey (eight operating and 23 prospective ventures) are located in these states and Corps Districts. Other areas in which there has been substantial development activity include California (four operating and eight prospective ventures), the Mississippi Delta region (three operating and two prospective ventures), and Virginia (three operating and one prospective venture).

The survey also elicited information on the specific markets (expected to be) served by ventures, the source of capital (expected to be) used for producing mitigation wetlands, as well as the financial objective of ventures. With respect to type of markets served, eleven (approximately 14%) of the identified ventures are or will be limited to providing compensatory mitigation for CWA Section 404 Nationwide permit (NWP) impacts, primarily NWP No. 26. Many of the other identified ventures may also focus on NWP impacts, but are or will not be limited exclusively to that market type of use. With respect to source of production capital, about 32 (41%) of the identified ventures are or are expected to be capitalized exclusively with private resources.

With respect to financial objective, the survey results suggest that 50 ventures (64%) pursue a "maximize-return" or "cost-plus" financial objective, where the former means that ventures

will price credits so as to maximize the difference between credit revenues and production cost, and the latter means that ventures will price credits so as to generate a small profit over production costs. The other 27 ventures pursue a "break-even" financial goal, whereby they will price credits so that credit sales revenue will just cover production costs.

The report uses the source of capital and financial objective variables as classifiers to define 12 possible types of credit ventures, and uses this taxonomy to classify and review the 24 operating credit ventures identified by the survey. Nine of the operating credit ventures are capitalized exclusively with private resources, all of which represent private sector operations which seek to maximize net return on investment. Three operating ventures were developed and capitalized exclusively with public resources, and pursue a break-even financial goal. Three of the operating ventures are capitalized exclusively with mitigation fee revenues, and pursue a break-even financial objective. Nine of the operating ventures are capitalized by a combination of capital sources. Two of these pursue a maximize-return financial objective, and another two have a cost-plus financial objective. The other five operating ventures that are capitalized with a combination of capital sources all pursue a break-even financial objective.

Chapter 3 provides detailed case studies for six of the operating credit ventures that are representative of the different venture types identified by the venture taxonomy developed in Chapter 2. The ventures chosen for case study analysis illustrate a wide range of venture institutional forms and operating characteristics. The following banks served as case studies: *St. Charles* (IL), *Cottonwood Creek* (CA), *Pine Flatwood* (LA), *Vandross Bay* (SC), *Delta Land Trust* (MS, LA), and the *Ohio Wetlands Foundation*. The case studies provide summary information on the following venture elements: location, credit

producer, operating agreement, landowner, mitigation plan, market, service area, credit evaluation and trading, credit price, success criteria, monitoring and maintenance, long-term protection and management, timing of credit sales, financial assurance/contingency plans, and current status.

Bank sponsors indicate that the process to develop bank agreements has been very contentious to date, and, as a result, time consuming. There appears to be a need for:

- (1) a model banking instrument;
- (2) bank planning and technical information transfer to field regulatory offices; and
- (3) better application of consensus building mechanisms and tools.

The long-term ecological success of the case study ventures cannot yet be forecast due to the recency of their construction. They appear, at this point, to be capable of achieving ecological success.



ACKNOWLEDGMENTS

This report was prepared as part of the National Wetland Mitigation Banking Study conducted by the Institute for Water Resources (IWR), U.S. Army Corps of Engineers (Corps). Section 307(d) of the Water Resources Development Act of 1990 provided authority to the Assistant Secretary of the Army for Civil Works for the study.

The National Wetland Mitigation Banking Study is conducted within the IWR Policy and Special Studies Division, whose chief is Eugene Z. Stakhiv. This report and the national study has benefitted from Dr. Stakhiv's review and guidance throughout the course of the ongoing study. Kyle E. Schilling is the director of IWR. The study is overseen by the Policy Review and Analysis Division and the Regulatory Branch, Operations, Construction and Readiness Division within the Directorate of Civil Works of the Headquarters of the U.S. Army Corps of Engineers (HQUSACE). The national study is managed by Dr. Robert Brumbaugh, IWR.

This report was prepared by Paul Scodari (King and Associates, Washington, DC) and Robert Brumbaugh.

The First Phase Report of the National Study recognized that the greatest opportunity for banking was for the practice to be available to the "every-day" permit applicant that requires compensatory mitigation. The National Study Report Commercial Wetland Mitigation Credit

Markets: Theory and Practice (IWR Report 95-WMB-7) discusses issues associated with the provision of compensatory mitigation commercially, that is, to third party permit applicants. The report examined regulatory influences on the ecological and economic success of commercial ventures.

In the time since that report was prepared (Summer 1995), many ventures have been started-up and many others proposed. This report provides the first summary of the status of commercial ventures since the involvement of the entrepreneurial private sector.

IWR conducted a survey of Corps Districts with the assistance of HQUSACE Regulatory Branch. Basic inventory information was provided by the district. IWR tasked Paul Scodari with gathering additional information for selected banks in the preparation of brief case studies. Relevant participants involved in the planning of the case study mitigation banks and interviewed for these case studies are listed in Appendix B.

Thanks are extended to Leonard Shabman (Virginia Tech) and Jack Chowning (Corps HQUSACE Regulatory Branch) who reviewed drafts of this report and Sue Elston (EPA Region V, Chicago) who reviewed portions of this document. Ms. Catherine Lisle provided editorial assistance for the draft report. Thanks are also extended to all Corps District staff who provided information in the 1995 inventory.



CHAPTER ONE. INTRODUCTION

Federal wetland regulations pursuant to Section 404 of the Clean Water Act (CWA), as well as many state and local regulatory programs, require applicants for wetland discharge (dredge or fill) permits to satisfy "mitigation sequencing" rules as a precondition for permitting. Mitigation sequencing requires permit applicants to first avoid and minimize wetland impacts to the extent practicable, and then provide compensatory mitigation for any remaining wetland impacts. Compensation is typically, but not always, expected in the form of wetlands restored from former or severely degraded wetlands, or created from uplands or deep water habitat.

Wetland regulations generally state a preference for mitigation to be constructed at or contiguous to the site of the permitted discharge in order to compensate for the specific wetland functions and values lost due to development. But since such "on-site" mitigation is not always feasible or environmentally desirable due to surrounding development which may compromise the long-term viability of replacement wetlands, regulators have increasingly allowed permit applicants to proceed with required mitigation "off-site."

One form of off-site mitigation is *mitigation banking*. Mitigation banks are typically large areas of replacement wetlands created for the express purpose of providing compensatory mitigation for more than one wetland development project. The use of mitigation banks can often streamline the permitting process, and the large-scale replacement wetlands they provide can often more effectively create and maintain wetland functioning than many smaller, and often isolated, on-site mitigation projects.

Most of the mitigation banks currently in operation were each developed by a single large public or private wetland developer to provide only for its own mitigation needs.¹ In recent years, however, interest in mitigation banking has expanded from such "single-user" mitigation banking into the arena of commercial mitigation banking. Many of the mitigation banking arrangements proposed and permitted in recent years involve commercial ventures developed by private entrepreneurs, non-profit entities, or public agencies to create mitigation credits (some measure of wetland functioning and/or area) for sale to the general universe of permit applicants in need of compensatory mitigation. These commercial operations include the so-called "in-lieu fee" systems in which regulators have allowed permit applicants to pay a mitigation fee in lieu of the direct provision of compensatory mitigation. Fee revenues are accumulated in trust and dedicated to the future construction of large-scale mitigation projects by public agencies or non-profit conservation entities.

This report refers to such mitigation operations as commercial *credit ventures*. The sale of mitigation credits from credit ventures to applicants for CWA Section 404 permits is termed commercial *credit trading*. The distinguishing feature of this mitigation option is that the approved sale and use of mitigation credits transfers legal and financial liability for the fulfillment of mitigation requirements from permittees to credit ventures.

¹ See: U.S. Army Corps of Engineers, Institute for Water Resources. 1994. *The National Wetland Mitigation Banking Study: First Phase Report*. Prepared by Robert Brumbaugh and Richard Reppert, Institute for Water Resources. IWR Report 94-WMB-4.

Introduction

This transfer of liability for compensatory mitigation requirements could potentially enable regulators to concentrate their limited oversight and enforcement resources on a much smaller number of mitigation sites and responsible parties.

Over the last several years this regulatory innovation has been advancing steadily in many areas of the country. The Clinton Administration's August 1993 Wetland Plan has coincided with and greatly enhanced the emergence of commercial banking (White House 1993). Prior to 1992, there were no entrepreneurial banks and only two publicly sponsored commercial banks (Brumbaugh 1995). The recently released Federal Mitigation Banking Guidance should further enhance development of commercial banking (Federal Register 1995).

In the summer of 1995, the U.S. Army Corps of Engineers (Corps), Institute for Water Resources (IWR) surveyed Corps District regulatory offices to obtain information on operating and prospective commercial credit ventures in their respective areas. The survey was conducted as part of IWR's *National Wetland Mitigation Banking Study*.²

The District offices were asked to complete a short survey form for each venture that solicited information on: (1) venture name, sponsor, and location; (2) venture status; (3) the source of resources (to be) used by the venture for capitalizing mitigation work; (4) the types of permitted impacts (to be) served by the venture, and (5) whether the venture was (is being) established under some type of area-wide rules or guidance for commercial credit trading.

Purpose and Scope

This report uses the survey results, and information gathered in follow-up contacts with District regulators and the sponsors of operating ventures, to organize and present information on the nationwide development of commercial credit ventures and credit trading within the 404 program. This information is provided in three parts.

First, the report presents a summary review of the development of credit ventures nationwide using the information directly gathered in the IWR survey. This review summarizes the general survey results regarding the number of credit ventures operating, proposed, and in planning in different areas of the country; the types of fill permits that ventures were (are being) developed to serve, and; the source of capital for and financial objectives of ventures. The summary also discusses how the development of area-wide rules or guidance for commercial credit trading in certain parts of the country has affected the development of credit ventures.

Second, the report identifies and provides an overview of those surveyed ventures that were in operation as of summer 1995. These ventures are classified and reviewed according to a taxonomy developed in a previous research effort for the *National Wetland Mitigation Banking Study*.³ This taxonomy helps to illustrate and facilitate discussion of the wide range of institutional forms and operating characteristics of operating credit ventures.

Third, the reports provides case studies for six operating credit ventures which are representative

² See: Institute for Water Resources, note 1.

³Paul Scodari, Leonard Shabman, and David White. 1995. *Commercial Wetland Mitigation Credit Markets: Theory and Practice*, U.S. Army Corps of Engineers, Institute for Water Resources. IWR Report 95-WMB-7.

of the different types of ventures defined by the venture taxonomy. These case studies provide more detailed information on the development, operation, and use of established credit ventures in different areas of the country.

The general survey results and the classification and overview of operating credit ventures is provided in Chapter 2. The case studies of individual ventures is presented in Chapter 3.



CHAPTER TWO. OVERVIEW OF SURVEY RESULTS

This chapter provides an overview of the survey results regarding the development of commercial credit ventures nationwide. It also classifies and discusses those ventures which were identified as being in operation when the survey was conducted. Operating ventures are defined here as credit ventures which have operating agreements authorized by the Corps under the CWA Section 404 program.⁴ This survey also includes other ventures that are, or have been, utilized to fulfill Section 404 compensatory mitigation requirements. A venture operating agreement may be in the form of a Section 404 permit and/or some form of interagency-agreement signed by the Corps.

Field Response to Survey

The Corps field offices identified more than 100 ventures. For the purpose of this study, those that did not meet the definition of a commercial credit venture adopted here were excluded. For example, those ventures which were developed by a sponsor to provide for its own mitigation needs, but which subsequently offered excess credits for sale to third parties, were culled from the final list.⁵ Similarly, mitigation operations in which permittees were

allowed to pay another party to produce their mitigation requirements off-site, but for which the payment did not transfer legal responsibility for compensatory mitigation, were also excluded. The final list includes 77 ventures that meet the definition of commercial credit ventures used here. Of these, 24 were in operation as of summer 1995; the others reflect prospective ventures that were either proposed or in planning at that time. The location, sponsorship, and other basic information of these ventures are presented in Appendix A. The general location of operational and proposed ventures are shown in Figure 1.⁶

Of the 11 Corps Divisions, the South Atlantic Division has seen the most activity in terms of commercial credit supply, with a total of 23 identified operating and prospective ventures.

South Atlantic Division	23
North Atlantic Division	17
South Pacific Division	12
North Central Division	8
Lower Mississippi Valley Division	6
Southwestern Division	6
North Pacific Division	3
Ohio River Division	2

In terms of operating ventures, the South Atlantic Division also leads the way:

South Atlantic Division	6
North Atlantic Division	4
South Pacific Division	4

⁴ There may be other operating banks permitted by non-Federal entities, but neither permitted by the Corps nor with permitted use by the Corps.

⁵ Examples of this type of venture, identified by the initial survey, but excluded from this study, include Cañada Gobernadora (CA) and Aliso Creek Wildlife Enhancement Project (CA). While they may sell credits (i.e., provide compensatory mitigation) to other permit applicants, both were established primarily to compensate for the sponsoring land development company mitigation requirements.

⁶ This survey includes only those venture identified by the Corps districts or known to the authors at that time. Undoubtedly, there were other ventures in some stage of planning, as well as non-Federally authorized operating ventures.

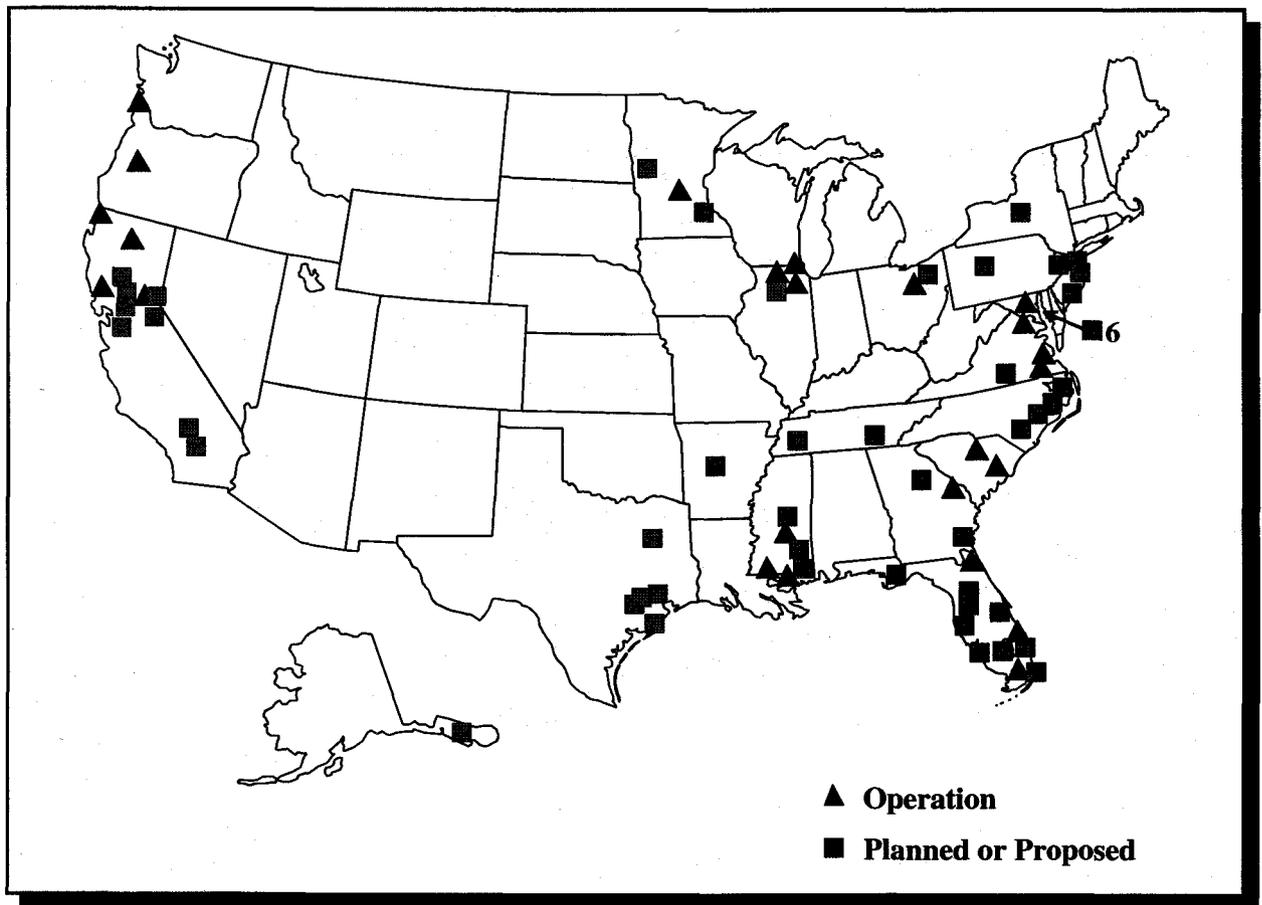


Figure 1. Commercial Wetland Mitigation Ventures, July 1995

Lower Mississippi Valley Division	3
North Pacific Division	2
Ohio River Division	1

The survey results suggest that a very large share of the nationwide development of this regulatory innovation is occurring in areas for which area-wide rules or guidance for commercial credit trading have been developed. For example, Maryland, Florida, and Minnesota have developed state-wide rules for commercial credit trading. Similarly, various Corps Districts, including the Chicago and Galveston Districts, have developed regulatory guidance for their respective

jurisdictions.⁷ More than one-third of all operating and prospective ventures identified by the IWR survey (eight operating and 23 prospective ventures) are located in these states and Corps Districts.

The explosive manner in which this concept is being implemented in Florida is demonstrated by the fact that when the survey was conducted in July 1995, the Corps identified 12 operating or planned ventures. By late February 1996, the State of Florida Department of Environmental Protection

⁷ For a detailed discussion of these area-wide rules for commercial credit trading, see: Scodari et al., note 3.

(DEP) listed 32 commercial mitigation credit supply ventures in their system—7 permitted, 16 pending, and 9 in a pre-application stage (Florida DEP, 1996a). By the end of August 1996, the number of permitted ventures had already increased to ten (Florida DEP, 1996b).

Other areas in which there has been substantial development activity include California (four operating and eight prospective ventures), the Mississippi Delta region (three operating and two prospective ventures), and Virginia (three operating and one prospective venture). In addition, a number of the identified operating and prospective ventures were associated with localities which have developed watershed management plans that include provisions for commercial credit trading. These include Juneau (AK), West Eugene (OR), Hackensack (NJ), Dade County (FL), and DuPage County (IL).⁸

The survey questionnaire also solicited information on the markets (expected to be) served by ventures, the source of capital (expected to be) used for producing replacement wetlands, as well as the financial objectives of ventures. The aggregate survey results with respect to these variables are reviewed briefly below. These results should be viewed as preliminary only, since many of the identified ventures are still early in the planning stage.

With respect to markets served, the survey results suggest that approximately 14% (eleven) of the identified ventures are or will be limited to providing compensatory mitigation for CWA Section 404 Nationwide permit (NWP) impacts, primarily NWP No. 26. Many of the other ventures also will focus on the NWP market, but

are or will not be limited exclusively to that market.

With respect to source of capital, about 41% (32) of the identified ventures were or are expected to be capitalized exclusively with private resources, and approximately 5% (four) were or are expected to be capitalized exclusively with public resources. Another 9% (7) indicated they are or will be capitalized exclusively with mitigation fees charged to permit applicants. The remaining ventures (45% or 34 ventures) are or will be capitalized with a combination of capital sources.

Finally, the survey results indicate that about two-thirds (50) of the identified ventures pursue a "maximize-return" or a "cost-plus" financial goal. The other one-third (27 ventures) pursue a "break-even" financial goal. Definitions for these financial objectives of credit ventures are provided below.

Operating Credit Ventures

A general classification system frequently used to differentiate among commercial credit ventures⁹ divides credit ventures into two broad types: commercial mitigation banks and in-lieu fee systems. Under such a classification, commercial banks are defined as commercial off-site mitigation operations in which the replacement wetlands are at least in part created in advance of credit sales to permittees. Fee systems (also sometimes called "mitigation trusts") have been defined as arrangements in which certain permittees are charged fees in lieu of the direct provision of compensatory mitigation by the permittee. Fee revenues are accumulated in a dedicated fund that is intended to be used at some future date for the construction of large-scale replacement wetlands.

⁸ For a detailed discussion of these local watershed management plans, see: David White and Leonard Shabman. 1995. *Watershed Based Planning: A Case Study Report*. IWR Report 95-WMB-8, U.S. Army Corps of Engineers, Institute for Water Resources.

⁹ Institute for Water Resources, note 1.

In effect, this classification distinguishes commercial mitigation banks from fee systems according to the time when replacement wetlands are provided relative to the time that credits are sold or mitigation fees charged: banks are assumed to provide “advanced mitigation” while fee systems are not. However, this assumes that the concept of advanced mitigation can be precisely defined. To some, advanced mitigation means the provision of fully functioning wetlands before credits sales are allowed. However, very few of the off-site mitigation systems developed to date, including “single-user” banks, have met this standard.¹⁰ The experience with commercial credit trading suggests that while all operating credit ventures provide some level of advanced planning for the provision of replacement wetlands, there is substantial variation in the timing of actual mitigation work (as well as the maturation of replacement wetlands provided) relative to the time at which credit sales are allowed.

An earlier research effort for the *National Wetland Mitigation Banking Study* developed a more descriptive taxonomy that better illustrates the range of institutional forms and operating characteristics of commercial credit ventures.¹¹ That taxonomy is presented and used in Table 1 to classify the operating ventures identified in the IWR survey. The Table 1 matrix uses two variables as classifiers: (1) financial objective and (2) source of capital.

The financial objective classifier relates to how credit ventures price credits relative to their commercial production costs. Table 1 shows three possible financial objectives of credit ventures: maximize-return, cost-plus, and break-even. A credit venture whose financial objective is to *maximize return* will price credits so as to maximize the difference between its total sales revenue and commercial cost of production.

Ventures sponsored by for-profit private sector firms would be expected to seek this financial outcome. A venture that adopts a *cost-plus* financial goal will price credits so as to generate a “small” profit over commercial cost, usually established as a percentage of total cost. A venture might adopt a cost-plus objective if, for example, it is sponsored by a non-profit conservation entity that wants to earn a small financial surplus to be used for watershed restoration activities in a broader context. Finally, a credit venture that adopts a *break-even* financial objective will price credits so that its sales revenue will just cover its commercial production cost. A government-sponsored credit venture, for example, might adopt a break-even financial objective to promote economic development by ensuring that mitigation costs to permittees are no higher than necessary. Because many government entities are prohibited by law from seeking profits, publicly-sponsored credit ventures often may be required to accept credit prices that just equal production costs.

The source of capital classifier refers to the origins of the production inputs of land, equipment and materials, and management used to produce replacement wetlands. These production inputs might already be owned by a venture sponsor, or might need to be purchased or leased. Table 1 shows four possible sources of capital: private sector resources, public sector resources, dedicated mitigation fee revenues, and some combination of these sources.

The private and public capital source categories identify ventures that commit private or public resources, respectively, to the production of replacement wetlands *prior* to the initial sale of credits. These capital source categories include ventures that are required to construct replacement wetlands *or* to post financial assurances for mitigation work as a precondition for credit sales.

¹⁰ Institute for Water Resources, note 1.

¹¹ Scodari, et al., note 3.

TABLE 1. Commercial Wetland Credit Ventures Taxonomy*
(Operating ventures—permitted by Corps or used by Corps permit applicants as of 1995)

FINANCIAL OBJECTIVE	SOURCE OF CAPITAL			
	PRIVATE CAPITAL	PUBLIC CAPITAL	MITIGATION FEE REVENUE	COMBINATION
MAXIMIZE NET RETURN (maximize difference between revenue and commercial cost)	Pembroke Pines (FL) Mitigation Solutions (FL) St. Charles (IL) Millhaven (GA) Neabsco (VA) White Cedar (VA) Christian Properties (MN) Wildlands (CA) Friends Neck (SC)			Wikiup (CA) Vandross Bay (SC)
COST PLUS (recover something over commercial cost)				Delta Land Trust (MS, LA) Wadsworth (IL)
BREAK EVEN (recover commercial cost)		Cottonwood Creek (CA) Astoria Airport (OR) Bracut Marsh (CA)	Pine Flatwood (LA) Maryland Nontidal Wetland Fund Virginia Restoration Trust	DuPage County (IL) Dade County (FL) West Eugene (OR) Ohio Wetlands Foundation (OH) Cypress Island (LA)

* This taxonomy was presented in an earlier report by Scodari et al. 1995. The categorization of some of these ventures has changed since that report, in part owing to more information.

Overview of Survey Results

The mitigation fee revenue source category identifies those ventures in which all of the commercial resources used to capitalize credit production—including land—are paid for entirely with mitigation fees charged to permittees. These ventures necessarily do not involve any up-front commitment of capital for producing replacement wetlands relative to the time at which mitigation fees are charged to permittees.

Finally, some ventures rely on a combination of capital sources for the production of replacement wetlands. This category includes ventures that rely on public lands for mitigation siting which is provided free of charge,¹² but for which all other inputs are paid for with private capital or mitigation fee revenues. This venture category also includes ventures which rely at least in part on revenues from up-front credit sales to finance mitigation work *and* were not required to post financial assurances in return for the ability to sell credits prior to mitigation construction. In this case the right to engage in “early” credit sales is not backed by the up-front commitment of private (public) capital in the form of financial assurances. These ventures in essence are capitalized *in part* with mitigation fee revenues.

The Table 1 matrix uses the two classifiers discussed above to identify a total of 12 possible types of credit ventures, half of which are represented by at least one of the operating ventures identified by the IWR survey. An overview of these operating ventures follows below.

Ventures Capitalized with Private Resources

The IWR survey identified a total of nine operating ventures that are capitalized exclusively with

private resources, all of which represent private sector operations which seek to maximize net return on investment. These include Millhaven (GA), Pembroke Pines (FL), Mitigation Solutions (FL), St. Charles (IL), Friends Neck (SC), Neabsco (VA), White Cedar (VA), Wildlands (CA), and Christian Properties (MN).

The *Millhaven* venture (also known as *WET, Inc.*), which received its 404 operating permit in 1992, was the first private commercial credit venture to receive Corps approval. Millhaven’s permit requires the completion of mitigation work, as well as the posting of financial assurance for mitigation success, as a precondition for credit sales. Once the Corps makes a “preliminary determination of hydrology” for a restored parcel, the venture is then allowed to sell one-half of the credits generated by that parcel. The remaining credits can then be released for sale upon a final determination of hydrology by the Corps. As of November 1995, Millhaven had completed mitigation work for 80 to 100 acres and the Corps had made a preliminary determination of hydrology for 60 acres, enabling the venture to sell 30 acres worth of credits. However, the venture had only sold six acres of credits as a result of factors which had limited credit demand. These factors include a sponsor-perceived regulatory bias for on-site mitigation in the case of 404 individual permits. Further, until very recently, the Corps Savannah District generally did not require mitigation for Nationwide permit (NWP) impacts. The Savannah District is now requiring mitigation for NWP impacts greater than three to four acres, and credit sales to such permittees are expected in the near future.

Pembroke Pines, Mitigation Solutions, Friends Neck, and St. Charles were each allowed to proceed with credit sales prior to the construction of replacement wetlands, but, in return for this opportunity, were required to post financial assurances as a precondition for credit sales. The *Pembroke Pines* venture (also known as *Florida*

¹² In these cases, however, some sponsors may provide funds to the public entity, e.g., in the form of an endowment, for long-term management.

Wetlandsbank) proceeds with mitigation work in discrete phases immediately following the sale of credits for projects permitted pursuant to 404 individual permits as well as state and local permit programs. Pembroke Pines' state-issued operating permit was developed in conformance with the Florida state rules for commercial credit trading promulgated in 1994.

The *Mitigation Solutions* venture, which was also established in conformance with the Florida state rules, received its operating permit in 1995. As of November 1995, the venture had sold credits for several project impacts associated with state permits and 404 Nationwide permits, for which it was required to post financial assurance for mitigation construction and success. As of that date, site construction except for planting had been completed.

The *Friends Neck* venture, which received its operating permit in 1995, was also required to post financial assurances in return for right to sell a limited portion of credit capacity for 404 individual and Nationwide permit impacts prior to the construction of replacement wetlands. The venture has been debited and, as of November 1995, site construction was underway.

The *St. Charles* venture was developed pursuant to area-wide rules for commercial credit trading set forth in the *Interagency Coordination Agreement on Mitigation Banking within the Regulatory Boundaries of Chicago District, Corps of Engineers* (ICA). Pursuant to the ICA, St. Charles was allowed to sell 30% of credit capacity prior to site construction. The site was constructed and planted in 1994 and, under the terms of the ICA, is now allowed to sell 70% of credit capacity. As of November 1995, the St. Charles venture had sold somewhat less than the allowable amount, primarily for projects permitted under NWP 26.

All of the other ventures included in this venture class were required to construct replacement

wetlands prior to credit sales, and were not required to post financial assurances for mitigation work. The *Wildlands*, *Neabsco*, and *White Cedar* ventures were each required to achieve certain success criteria for replacement wetlands prior to credit sales. The operating permits for these ventures also limit credit sales within the 404 program to NWP impacts, and each is being constructed in stages.

The final venture listed in this category—*Christian Properties*—is part of a state-wide mitigation program developed under the Minnesota Wetland Conservation Act of 1991 to provide a ready supply of compensatory mitigation for the state permit program. Under the state-wide program, private landowners and local government entities can create or restore wetlands on lands they own in order to produce mitigation credits. Six months must pass after the completion of wetland restoration (one year for wetland creation) before "local government units" will approve site credits for deposit into the state bank. The owners of credit deposits are called "account holders," who are free to use their credits for their own mitigation needs or to sell them to others in need of compensatory mitigation under the state regulatory program.

As of November 1995, approximately 40 individual account holders accounted for over 700 acres of wetland credit deposits into the state program, and another 50 accounts associated with potential and commenced restoration projects would add over 3000 acres of credits to the program when complete. Account holders include private individuals as well as state and county highway departments, and other local government entities. Most state and county highway department account holders plan to use their credits for their own mitigation needs, although some counties may eventually sell some credits to private landowners. Privately-held credits are available for sale unless the account holder has an anticipated need for the credits. Christian

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Properties represents one account holder that has officially requested Corps review and approval of its mitigation site for use under the 404 program.

Ventures Capitalized with Public Resources

Three operating credit ventures—Cottonwood Creek (CA), Bracut Marsh (CA), and Astoria Airport (OR)—were developed and capitalized with public resources.

The *Cottonwood Creek* venture, sponsored by the California Department of Fish and Game (CDFG), pursues a break-even financial goal. The venture focuses on wetland creation on lands owned by CDFG in order to provide mitigation for small-scale, isolated wetland impacts that fall outside 404 jurisdiction, as well as for 404 NWP and individual permit impacts of 1-5 acres subject to Corps approval on case-by-case basis. The mitigation work is proceeding in stages and, as of November 1995, mitigation work had been completed on a total of eight acres which were used to provide mitigation for four projects, three of which involved 404 permits.

Two other publicly-capitalized credit ventures—Astoria Airport (OR) and Bracut Marsh (CA)—are among the oldest operating mitigation credit ventures of any type.

Astoria Airport was developed by the Oregon Division of State Lands to provide credits for the Port of Astoria and other general water-dependent projects. The Astoria venture was part of a comprehensive plan for a 16-mile reach of the Columbia River. The Port reserved credits by deeding the land and providing fill material for the project. Approximately 60 of the 70 expected credits remain. The Corps suspended use of the venture for 404 permitting in 1992 due to problems with the venture's replacement wetlands. Restoration of a mostly upland fill site into brackish marsh was not successful. The restoration resulted in freshwater wetlands.

The *Bracut Marsh* venture services permits for "pocket marshes" in the City of Eureka and estuaries in the Humboldt Bay area. The venture was developed by the California Coastal Conservancy. The Corps was not a signatory to the operating agreement for the Bracut venture, and did not, at the time, claim jurisdiction of the specific wetlands for which the venture was developed to provide compensatory mitigation.¹³ The Conservancy and State Coastal Commission conceived the venture as a fully reimbursable effort with Conservancy expenditures reimbursed on a pro-rata basis by mitigation fees. However, only construction and management costs were included in the computation of mitigation fees. As of 1992, only 54% reimbursement of expenditures were expected. Further, several remedial actions have been necessary, owing to inadequate hydrology and substrate problems.

Ventures Capitalized Exclusively with Mitigation Fee Revenues

The IWR survey identified three ventures that provide compensatory mitigation for 404 permit impacts which are capitalized exclusively with mitigation fee revenues. These include the Maryland Nontidal Wetlands Compensation Fund, Pine Flatwood (LA), and the Virginia Restoration Trust.

The *Maryland Nontidal Wetlands Compensation Fund* is a state-run program developed pursuant to the Maryland Nontidal Wetlands Protection Act which collects mitigation fees for small-scale impacts permitted under the state regulatory program, as well as for certain 404 permit impacts which the state oversees through General

¹³ Case studies of these two ventures are presented in: Environmental Law Institute and Institute for Water Resources. 1994. *Wetland Mitigation Banking: Resource Document*. U.S. Army Corps of Engineers, Institute for Water Resources. IWR Report 94-WMB-2. (January).

Programmatic Permit authority. The general permit serves as the operating agreement between the state and the Corps for fee-based compensation. For impacts to nontidal wetlands involving less than five acres, the Corps Baltimore District may authorize activities under the general permit, while projects over five acres require both state and 404 permits. The venture has been collecting mitigation fees since 1991 which are used by the state regulatory agency for the purchase, restoration, and management of nontidal wetlands throughout the state. As of mid-1994, a total of eight sites had been purchased and restored through the venture, and six other restoration sites were under construction or in planning.

The Pine Flatwood and Virginia Restoration Trust ventures were both established by MOAs between the Corps and The Nature Conservancy (TNC). Under these ventures, Corps-approved permittees pay mitigation fees to the TNC which are held in trust for the eventual purchase of privately-owned wetlands, and their subsequent preservation or restoration and long-term management.

Pine Flatwood has been operational since 1992. It provides the fee option for 404 individual permit impacts involving Longleaf Pine Flatwood wetlands in Southeastern Louisiana, and applies fee revenues for the purchase and active management of these wetlands. As of November 1995, one large site had been purchased and was being actively managed by TNC, and acquisition of a second site was being pursued.

The *Virginia Restoration Trust*, which began operating in 1995, provides the fee option to Corps-approved applicants for Nationwide permits. Mitigation fees are held in trust by TNC for the purchase and preservation or restoration of critical wetlands and riparian habitats. A stated goal of the venture is to secure a minimum ratio of 2:1 (acres) of wetlands restored or created, or a minimum ratio of 10:1 (acres) of wetlands preserved for each wetland acre of Nationwide permit impact. This

will be accomplished by pooling funds so as to maximize size of sites purchased for restoration, creation, enhancement or preservation. Site suitability, maximum return on expended funds, wetland functions, and an acceptable restoration plan will be considered before approving sites for purchase. Fees are based on the market prices per acre of wetland mitigation (i.e., land purchase cost plus restoration, etc., cost) in the vicinity of the impacts. As of November 1995, the venture had collected fees from four permittees and TNC had developed a proposal for the purchase of a wetland preservation site.¹⁴

A number of other fee-type mitigation systems are in operation around the country that were not identified by the IWR survey, probably because they largely reflect ad-hoc operations that focus on the provision of project-specific, off-site mitigation. For example, the Corps Little Rock and Vicksburg Districts have allowed certain applicants for 404 general or individual permits, on a case-by-case basis, to pay The Nature Conservancy or other conservation entities to fulfill their project-specific mitigation requirements at an off-site location when on-site mitigation was deemed infeasible or environmentally undesirable.¹⁵

¹⁴As of August 1996, the Fund had collected fees from 11 NWP actions. TNC has used some of the funds to purchase 160 acres of valuable wetlands with upland inclusions on the Northwest River in Chesapeake, Virginia.

¹⁵The use of fee-based compensation in these two Corps Districts is discussed in: Apogee Research, Inc. 1993. *Alternative Mechanisms for Compensatory Mitigation: Case Studies and Lessons about Fee-Based Compensatory Wetlands Mitigation*. Working paper prepared for the U.S. Army Corps of Engineers, Institute for Water Resources.

Ventures Capitalized with a Combination of Capital Sources

The IWR survey identified nine operating credit ventures which are capitalized using a combination of capital sources, two of which—Wikiup (CA) and Vandross Bay (SC)—pursue a maximize-return financial goal. These two ventures are sponsored by private sector firms which use lands they own for the mitigation siting. Each was allowed to sell a limited portion of site credit capacity prior to the construction of replacement wetlands, but were not required to post financial assurances. These ventures are classified as being capitalized with a combination of capital sources because they rely at least in part on credit sales revenue to finance mitigation work, but were not required to commit up-front private (public) capital in the form of financial assurances in return for the right to engage in early credit sales

As of September 1995, the *Wikiup* mitigation site was under construction and, under the terms of its operating agreement (MOA finalized in 1995), the venture was allowed to sell some portion of site credits for 404 impacts, although no debiting had occurred as of that date. The *Vandross Bay* venture focuses on producing mitigation for 404 permitted impacts involving isolated and Carolina Bay type wetlands. As of November 1995, Vandross had sold 30 to 40 credits and site construction was complete.

Two of the surveyed ventures capitalized with a combination of capital sources—Delta Land Trust (MS, LA) and Wadsworth (IL)—have a cost-plus financial objective. *Delta Land Trust*, which received its operating permit in 1994, is a credit supply program sponsored by the Delta Land Trust, a non-profit organization dedicated to reforestation of bottomland hardwood wetlands in the Mississippi Delta region. Delta operates the program by securing conservation easements on privately-owned, prior-converted and farmed wetlands (individual sites must be a minimum of

100 acres), which are then restored by Delta in order to produce commercial mitigation credits. Delta's permit allows for the sale of a limited portion of credit capacity from any one site prior to the construction of replacement wetlands for 404 permit impacts involving forested wetland communities. Delta indicates that it will price credits somewhat above production costs in order to generate revenue for its various conservation efforts in the region. As of November 1995, Delta had not activated the program for reasons which are reviewed in Chapter 3.

Wadsworth is sponsored by Wetland Research, Inc., a non-profit organization that focuses on wetland restoration and creation in the Midwest. The Wadsworth venture, which received its operating permit in 1995, was developed pursuant to the area-wide guidance for commercial credit trading developed for the Corps Chicago District. Wadsworth focuses on the creation and enhancement of wetlands on land owned by the Lake County Forest Preserve. Under the Chicago District guidance, the venture was allowed to sell a limited portion of credit capacity for primarily NWP impacts prior to site construction. As of November 1995, site construction was still in progress.

The final five operating ventures which are capitalized with a combination of capital sources each have a break-even financial objective. These include ventures sponsored by DuPage County (IL), Dade County (FL), and West Eugene (OR) which were developed as part of watershed planning mechanisms implemented in these localities to reconcile wetland management and development goals. The watershed management plans each include some type of wetland categorization which defines the regulatory treatment to be given to different wetland areas, and each rely on credit trading in part to drive watershed restoration activities. Each of these management plans include the issuance of General Programmatic Permit authority to the locality or

some other alternative 404 permitting arrangement to facilitate implementation.¹⁶

The *DuPage County* venture (Cricket Creek), which received its Department of the Army permit in 1994, was developed to conform with the area-wide rules for commercial credit trading established by the Corps Chicago District. It relies on mitigation fees charged for permits issued by the county under 404 General Programmatic Permit authority received in 1995, and uses land owned by the DuPage County Forest Preserve District for wetland creation and enhancement. The venture has sold 10-20% of credit capacity, and site construction is underway.

The *Dade County* venture uses mitigation fees charged for 404 permits for the restoration of wetlands on public lands as part of the county watershed management plan. Under the plan, tree island wetlands are specified as off-limits to development, while other wetlands can be developed in return for a mitigation fee paid to the county for ongoing restoration projects in the Everglades National Park and other wetland sites in Dade County.

The *West Eugene* venture is a city-run mitigation credit system that is part of the city watershed management plan authorized by the Corps and the Oregon Division of State Lands in 1995. To help implement the plan, the Corps established an alternative 404 permitting procedure whereby it will issue "letters of permission" rather than individual permits for projects that have been approved by the city under the plan. Approved wetland development projects will be required to purchase mitigation credits from the credit system. Three types of credits are recognized: (1) banked credits, (2) concurrent credits, and (3) post credits. Banked credits are based on mitigation work already undertaken using public funds. Concurrent

credits will be associated with a mitigation fee that will be used to produce replacement wetlands concurrently with the permitted wetland impact, while post credits will be associated with fees that will be held in trust for the future production of replacement wetlands. The West Eugene mitigation work will proceed on lands which were purchased using Federal Land and Water Conservation Funds channeled through the Bureau of Land Management.

In 1993, West Eugene implemented a small restoration test site which relied on revenues from mitigation fees charged for permitted impacts under the state regulatory program to restore wetlands on lands owned by the Bureau of Land Management. As of November 1995, no other mitigation work had been implemented under the plan, and the Corps had not yet received a request by the city to activate the alternative permitting procedure for 404 permits requiring compensatory mitigation.

The final two ventures—the Ohio Wetlands Foundation (OWF) and Cypress Island (LA)—are sponsored by non-profit entities. The *Ohio Wetlands Foundation* (OWF) was established as a non-profit entity by the Ohio Homebuilders Association to produce readily available wetlands mitigation. OWF relies on fees charged for Nationwide permits, as authorized by the Corps on case-by-case basis, to fund the production of replacement wetlands on state-owned lands. The venture has been operating since 1992 and has completed mitigation work at two sites.

The *Cypress Island* venture is sponsored by the Louisiana Chapter of The Nature Conservancy (TNC). It relies on a prior-converted, bottomland hardwood site owned by TNC for the production of replacement wetlands. In 1994, TNC proposed use of the site for providing mitigation for 404 individual permits involving impacts to forested wetlands, and the Corps subsequently allowed 20 to 25 permittees to satisfy their mitigation

¹⁶ See: White and Shabman, note 4.

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requirements through payment of a fee to TNC. The mitigation fees are being held in trust by TNC and will be used to implement restoration of the site in early 1996.



CHAPTER THREE. CASE STUDIES OF SELECTED OPERATING CREDIT VENTURES

This section provides case studies for several of the operating commercial credit ventures identified by the IWR survey. Specifically, case studies are provided for six ventures that are representative of different venture types defined by the Table 1 taxonomy. The ventures chosen for case study analysis illustrate a wide range of institutional forms and operating characteristics. They include: St. Charles (IL), Cottonwood Creek (CA), Pine Flatwood (LA), Vandross Bay (SC), Delta Land Trust (MS, LA), and Ohio Wetlands Foundation.

The case studies provide summary information on the following venture characteristics: location, credit producer, operating agreement, landowner, mitigation plan, market, service area, credit evaluation and trading, credit price, success criteria, monitoring and maintenance, long-term protection and management, timing of credit sales, financial assurance/contingency plans, and current status. Unless otherwise indicated, current status and other information are as of November 1995.

Case Study 1: Venture Capitalized with Private Resources; Maximize-Return Financial Objective—*St. Charles*

Location: St. Charles Township in Kane County, Illinois

Credit Producer: Land and Water Resources, Inc (LWR).

Operating Agreement: CWA Section 404 individual permit issued in June 1994. The permit specifies that the bank should be operated in conformance with the *Agreement to Establish Wetlands Mitigation Bank* as executed by the St. Charles Park District and LWR (signed December 20, 1993). The permit also incorporates the rules and standards set forth in the *Interagency Coordination Agreement on Mitigation Banking within the Regulatory Boundaries of Chicago District, Corps of Engineers (ICA)*, signed in March 1994 by the Corps, USFWS, and USEPA.

Landowner: The St. Charles Park District. LWR paid the Park District for use of the land with a one-time lease payment (\$64,410), plus a profit-sharing arrangement whereby the Park District would receive a percentage of credit sales revenue exceeding a certain cost basis.

Mitigation Plan: The mitigation plan focuses on the restoration of hydrology and native communities on 36.1 acres of wetlands (riparian, emergent, wet prairie, and mesic prairie wetlands) and 11.9 acres of upland mesic prairie buffer through the removal of drainage tiles, partial excavation to create a variety of community habitats, and planting of wetland vegetation.

Case Studies of Selected Operating Credit Ventures

Market: While the venture permit does not place any limitations on the types of permit impacts that can be served, the venture is subject to the ICA, which says:

It is intended that mitigation banks...be used primarily to mitigate wetland impacts associated with projects which, individually, affect relatively small acreage of low value wetlands...Typically, these will be projects which, with mitigation, are currently authorized under Nationwide Permit No. 26.

Service Area: The ICA divides the Chicago District into five regional watershed areas. Ventures are limited to serving permit impacts which occur in the watershed area in which they are located (exceptions are allowed in certain cases, but such outside watershed trades are subject to higher trading ratios). St. Charles is located in the Fox River watershed, which includes parts of Kane, McHenry, Lake, Cook, Will and DuPage counties in Northeastern Illinois. The Fox River watershed within the Chicago Corps District is approximately 300 square miles.

Credit Evaluation and Trading: Credits are defined in terms of acres of wetland class. The Corps determined that the mitigation plan would produce a total of 46.17 acres of credits, based on full credit for wetland acres restored and partial credit for upland buffers. The ICA defines three types of credits: (1) uncertified—available for sale prior to construction of replacement wetlands, (2) conditionally certified—after the second growing season following construction if trending toward success, and (3) certified—replacement wetlands have met all success criteria. Trading ratios are 1:1 for certified credits, and 1.5:1 for uncertified or conditionally certified credits. For allowable trades outside watershed service area, trading ratios are increased by a factor of 2.

Credit Price: Credit prices per acre have been in the \$40-45,000 range.

Success Criteria: The venture is subject to the following performance standards mandated by the ICA: (1) Federal wetland delineation criteria met; (2) native perennial species of wetland plant community represent 50% of species within two years of planting, and 80% within five years; (3) at least 75% of total plant cover is obligate facultative wetland species; and, (4) at least 70% of species planted or seeded are alive.

Monitoring and Maintenance: The permit requires monitoring and maintenance of the site for five years following construction according to the specifications included in: (1) *Hydrological Monitoring Plan* developed by Christopher S. Burke Engineering Ltd. and (2) *St. Charles Wetland Bank Prairie and Wetland Planting Plan* developed by Applied Ecological Services, Inc. (Brodhead, Wisconsin). The venture established an irrevocable letter of credit, which names the Park District as the beneficiary, to fund monitoring and maintenance activities during the liability period. The funding level was determined by the bank sponsor and the Park District, based on Park District experience in managing several natural areas.

Long-Term Protection and Management: The site is protected under a perpetual conservation easement issued in 1994 by the Park District which pertains to all wetland and upland areas of the venture site. The conservation easement names the Park District as the entity responsible for long-term management of the site. The Park District used its share of the credit sales revenue to establish an endowment to fund long-term management.

Timing of Credit Sales: Upon approval of the venture's permit, uncertified credits (no more than 30% of the venture's credit capacity) are released for sale. An additional 20% of credit capacity can be sold when wetlands hydrology has been demonstrated (through monitoring on-site water table relationships), and another 20% when planting is complete. The final 30% of credit capacity is available for sale upon certification of credits (all success criteria are met).

Financial Assurance/Contingency Plans: The ICA requires that sales of uncertified credits must be backed with surety bonds or their equivalent equal to the estimated cost of generating conditionally certified credits. Once achieved, assurance amounts can be reduced to the cost of generating certified credits. The venture posted separate surety performance bonds for construction (earthmoving and placement of water control structures) and planting equal to the estimated cost of these activities. The construction bond (approximately \$7,000 per acre) is releasable following construction. One-half of the planting bond (approximately \$2,000 per acre) is releasable at the conclusion of planting; the other half cannot be released until success criteria are achieved. The surety bonds name the St. Charles Park District as the beneficiary. The venture sponsor was able to get a surety performance bond because it was a construction company with a long record of using bonds in its practices; no collateral was required. Details of the bonds are found in the agreement between the Park District and the bank sponsor, which is also referenced in the surety bond for the construction phase.

Current Status: The entire venture site was constructed and planted immediately following permit issuance in June 1994. Corps representatives report that hydrology has been restored and planted vegetation is progressing toward achievement of success criteria. As of November 1995 (after two growing seasons), the venture was allowed to sell up to 70% of credit capacity (i.e., all venture credits have been conditionally certified), but had sold somewhat less than this amount. [As of August 1996, all available credits (70% of capacity) had been sold. The venture sponsor had also started earth moving on a second bank (84 acres) on an adjoining tributary and connected by publicly-owned wetlands.]

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**Case Study 2: Venture Capitalized with Public Resources;
Break-Even Financial Objective—*Cottonwood Creek***

Location: Near the city of Cottonwood, in a corridor between the confluence of Cottonwood Creek and the Sacramento River, in Shasta County, California.

Credit Producer: California Department of Fish & Game (CDFG).

Operating Agreement: CWA Section 404 Nationwide Permit No. 26 issued in January 7, 1994. The permit incorporates the requirements and responsibilities set forth in the *Cottonwood Creek Mitigation Bank Plan*, dated April 28, 1994, as approved by the Corps, USEPA, USFWS, and the UCSCS (now NRCS).

Landowner: CDFG.

Mitigation Plan: The undeveloped mitigation site encompasses approximately 90 acres of pasture land adjoining Cottonwood Creek, which includes uplands and some jurisdictional wetlands (less than 10% of the site). The mitigation plan focuses on the creation of over 40 acres of permanent wetlands (6.5 acres of sloughs and ponds), semi-permanent wetlands (22.1 acres of freshwater emergent marsh and wet meadows), seasonal wetlands (8.8 acres of moist soil vegetated habitat), and riparian wetlands (2.8 acres along sloughs and water delivery ditches). Wetland creation involves the construction of required topography and impoundments, and planting of target species vegetation for each habitat type. The mitigation plan envisions that created wetlands will only require annual rainfall to stay viable. However, to account for the possibility that annual rainfall would not provide sufficient water to the site, and to maximize functional periods and habitat values, the CDFG has entered into a contractual agreement with the Anderson-Cottonwood Irrigation District (ACID) to provide a supplemental water supply to the site through an existing water delivery system to and on the site which is operated and maintained by ACID. This supplemental water source will be utilized as needed.

Market: The operational plan states that: "Use of the mitigation bank to offset wetland values and function is limited to impacted wetlands that are isolated and less than acre (or up to five acres with the Corps approval)." The venture market thus includes Nationwide Permit No. 26 (NWP 26) impacts less than one acre (for which the Corps does not require mitigation, but for which mitigation is often required under local land use permit programs), as well as NWP 26 and 404 individual permit impacts involving 1 to 5 acres. The Corps has final decision-making authority only for proposed trades involving individual permit impacts and NWP 26 impacts greater than one acre.

Service Area: Includes permitted wetland impacts that occur in the Northern Sacramento Valley floor in Shasta or Tehama County, as long as CDFG has determined that "...a lesser distance is not needed to assure effective compensation for affected species." The service area is approximately 1700 square miles.

Credit Evaluation and Trading: Credits are based on acres of wetland type. Only in-kind trades are allowed, unless there is no other viable mitigation option available and such out-of-kind trades are necessary to ensure no net loss of wetland acreage. The operational plan states that the following acreage trading ratios will apply:

(a) 2:1 for emergent freshwater marsh, (b) 2:1 for wet meadows, and (c) 3:1 for riparian wetlands. If permitted wetland impacts occur in conjunction with impacts to climax riparian woodland and/or deepwater habitat, trading ratios will be determined by the lead regulatory agency on a case-by-case basis and may exceed 3:1. The operational plan also allows for trading ratios to be reduced (but in no case below 1:1) in cases in which the permittee agrees to perform all or part of the mitigation work on the venture site required to compensate for its project impacts.

Credit Price: The purchase price of mitigation credits are to be at least sufficient to offset all costs associated with bank establishment and perpetual operation and maintenance, and should include an amount to allow for remedial measures. These costs are determined using the following factors: fair-market value (prior to conversion to wetland habitat) or current value; site acquisition transaction costs; planning; engineering design; administration, operation, and maintenance costs; taxes, insurance, water supplies, equipment, and personnel; all costs associated to reflect inflation and bank evaluations and monitoring; and any other costs relevant to preserving wetlands in perpetuity. CDFG estimated these costs at \$25,609 per acre. Fees collected are used to fund several long-term endowments. The CDFG can also collect fees from developers for unexpected bank creation costs.

Success Criteria: The operational plan states that: "Project wetlands will be deemed to have been successfully established when a minimum of 60 percent of the hydric vegetation (as measured by relative cover) is composed of target genera for each wetland habitat type....During the first three years, a minimum of 20 percent composition of target genera per year will be the goal."

Monitoring and Maintenance: CDFG is responsible for annual monitoring of the site following construction for a period of five years. Specific remedial measures are required when monitoring finds that staged success criteria have not been met in years 1 to 4 following construction. These remedial actions include replanting, changes in water delivery and water manipulation, and soil amendments.

Long-Term Protection and Management: Once all available venture credits have been sold, CDFG will be responsible for maintaining the site as wetlands in perpetuity. The operational plan requires CDFG to develop a closure plan that will be subject to approval by the Corps. The plan also requires CDFG to deposit a portion of credit sales revenue into a special interest-bearing endowment account, with the interest to be used for funding long-term management of the site. Using its prior experience with wetland creation projects (and a 24% overhead factor), CDFG estimated the funds per acre (\$1488) to be deposited into the long-term management interest-bearing endowment account. Long-term interest-bearing endowments are also set up for: emergency-water irrigation; in-lieu taxes; mosquito abatement; and, operation and maintenance (a quarter time Fish and Wildlife assistant).

Timing of Credit Sales: The operational plan allows for the sale of credits immediately following construction and evaluation of mitigation work. It states:

...distribution of bank credits at this wetland mitigation bank site which will create new wetland and riparian habitat but which have not yet reached a mature climax successional stage will be permitted if the bank site has been established and the Department continues to achieve the performance of objectives specified in the development plan.

*Case Studies of Selected
Operating Credit Ventures*

Financial Assurance/Contingency Plans: No financial assurance is required as a pre-condition for credit sales. The operational plan does provide that if the performance objectives of the design plan have not been met or the conditions of the bank site change which alter the further development of the design plan, sale of credits shall be suspended until a Corps-approved remediation plan is successfully implemented. It also includes the following language: "If fourth year monitoring reveals that all goals have not been met, then another site will be developed to substitute for the failed site."

Current Status: Wetland creation (grading, construction of impoundment, planting) proceeded on a total of eight acres during the summer and fall of 1995. Due to less than normal rainfall during this period, the eight acres of mitigation have not achieved desired saturation. Delivery of the supplemental water source was scheduled to begin sometime in December 1995 to remedy this situation. The credits produced by this first stage of site construction were sold to four different permittees. Three of the four sales were for 404 NWP 26 permits, and thus required prior approval by Corps. The other credit sale was for permitted impacts to riparian habitat involving less than one acre.

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Case Study 3: Venture Capitalized Exclusively with Mitigation Fee Revenues; Break-Even Financial Objective—*Pine Flatwood*

Location: Lake Ramsey (near Covington) and other prospective sites in St. Tammany Parish, Louisiana.

Credit Producer: The Nature Conservancy (TNC), Louisiana Chapter.

Operating Agreement: MOA between the Corps, USEPA, USFWS, Louisiana Department of Natural Resources, Louisiana Department of Wildlife and Fisheries, and TNC signed in January 1992.

Landowner: Mitigation sites are purchased and held for conservation purposes by TNC.

Mitigation Plan: The venture focuses on the acquisition, preservation, and active maintenance of pine flatwood wetlands (closed pine flatwoods, pine flatwood savannahs, bayhead swamps, and slash pine-cypress and hardwood forests) in Southeastern Louisiana. Because these wetlands are impossible to replace, can only survive in large tracts, and require active fire and hydrology management to stay viable, the Corps has allowed permittees to pay a mitigation fee in lieu of the direct provision of mitigation for unavoidable impacts to these wetlands. Once the Corps determines a permittee's mitigation requirement in acres, TNC determines the

appropriate mitigation fee. Fees are paid directly to TNC and held in trust for the eventual purchase, preservation, and active maintenance of pine flatwood wetlands.

Market: CWA Section 404 and state permits involving unavoidable impacts to pine flatwood wetlands.

Service Area: Permit impacts in Southeastern Louisiana parishes that lie east of the Mississippi River and north of Lake Ponchartrain. This area is approximately 4,000 square miles in size.

Credit Evaluation and Trading: The MOA stipulates that: "In all cases, mitigation should provide, at a minimum, one for one functional replacement (no net loss of ecological value), with an adequate margin of safety to reflect the expected degree of success associated with the mitigation plan." Initially, the Corps used a 1:1 replacement ratio defined in acres. Now, the Corps uses functional assessment methods to assess impacts and determine mitigation requirements that ensure functional equivalency. Both the "Habitat Evaluation Procedure" and an "Ecological Value Assessment" (which uses numeric criteria to consider landscape position, hydrologic integrity, unnatural disturbances and other factors) are used to assess the quality of impacted and replacement wetlands. Trades based on functional equivalency are then translated into areal mitigation requirements.

Credit Price: Costs included in calculation of compensatory mitigation fees are: planning; land acquisition; project implementation; and site management. As of 1993, the fee per mitigated acre was about \$1700.

Success Criteria: The MOA includes standards for site selection, but does not include specific success criteria for replacement wetlands because pine flatwood wetlands are not well-understood, and no clear and objective basis for measuring success exists.

Monitoring and Maintenance: The mitigation sites are managed according to best management practices for pine flatwood wetlands, which include, at a minimum, "judicious use of prescribed fire in fire-dependent systems, control of shallow-water hydrology on-site and immediately surrounding the bank site, and restriction of unnatural disturbances." Mitigation sites will be actively managed for a period of 50 years, and monitored approximately every five years by an interagency team to determine if replacement wetland values are increasing as expected.

Long-Term Protection and Management: After the 50-year management period has ended, TNC will retain ownership of mitigation sites and continue management, or will transfer sites to a private conservation entity or government agency that will assume management responsibilities.

Timing of Credit Sales: Mitigation fees are charged prior to the provision of replacement wetlands. Fees are accumulated in trust by TNC and, when sufficient, are used to purchase, preserve, and manage large tracts of replacement wetlands.

Financial Assurance/Contingency Plans: Financial assurance is not required. The MOA states that:

...in the event that TNC for any reason becomes unable to operate the mitigation bank, operation of the bank may be transferred to a private conservation entity or governmental

***Case Studies of Selected
Operating Credit Ventures***

agency as agreed to by all signatories to the Agreement. If operation of the bank is transferred, title to all mitigation areas and all remaining management and administrative funds in the bank will be transferred to the new bank operator, subject to perpetual covenants and easement that guarantee operation of the bank....

Current Status: The first and presently the only mitigation site (Lake Ramsey) was purchased about one year after the first mitigation fees were collected. TNC has made a number of unsuccessful attempts to purchase additional sites, and, as of November 1995, were hoping to soon finalize purchase of a second tract. At that time the trust contained over \$500 thousand in mitigation fee revenues.

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**Case Study 4: Venture Capitalized with a Combination of Capital Sources;
Maximize-Return Financial Objective—*Vandross Bay***

Location: Vandross Bay, northwest of Yauhannah, in Georgetown County, South Carolina.

Credit Producer: The Combahee Land Company, Charleston, South Carolina.

Operating Agreement: CWA Section 404 individual permit issued in October 1994. Incorporates the stipulations, requirements, and commitments contained in the final *Vandross Bay Mitigation Bank Plan* as last revised in August 1994.

Landowner: The Combahee Land Company (CLC).

Mitigation Plan: The venture mitigation site includes 804 acres, of which 142 acres are uplands and 662 acres are jurisdictional wetlands. The wetlands include 658 acres of Carolina Bay Complex (CBC) wetlands (of which 31 acres have been impacted by silviculture and dominated by planted loblolly pines), and four acres of isolated depressional wetlands and hardwood drains. The mitigation plan involves restoration and enhancement of jurisdictional wetlands, and preservation and management of upland buffers. Wetland enhancement involves the restoration of a natural hydrology regime through the use of earthen plugs placed in drainage ditches (to block the flow of water that would otherwise be drained from the site), and restoration of vegetative communities in the 31 acres of pine plantation in the CBC by selective timber cutting, leaving the indigenous wetland species intact.

Market: Unavoidable CWA Section 404 permit impacts to isolated wetlands and Carolina Bay type wetlands.

Service Area: The venture can serve permit impacts involving isolated wetlands that occur within the coastal plain of South Carolina, which is defined to include 17 counties, approximately 14,000 square miles. It can also serve permit impacts involving Carolina Bay wetlands that occur anywhere in the state.

Credit Evaluation and Trading: Credit capacity was determined using an assessment methodology (SOP-93-02) utilized by the Corps Charleston District Regulatory Branch for evaluating mitigation. Using this methodology, the Corps determined that the mitigation plan would produce 723.8 credits. Credit requirements for individual trades are determined by the Corps on a case-by-case basis. The Combahee Land Company provides data sheets for each credit/debit transaction to the Corps, the South Carolina Department of Health and Environmental Control and/or South Carolina Coastal Council. Annual summary of bank transactions are provided to each party.

Credit Price: Credits have sold for approximately \$1,800 each.

Success Criteria: The restoration effort will be deemed successful and complete if, at the end of the six year monitoring program, the restoration area is vegetatively dominated by wetland plant species indigenous to the CBC. Also, the occurrence of loblolly pine within the restoration area may not exceed the percentage naturally occurring within the bay as a whole. Restoration of hydrology within the CBC will be considered successful and complete when earthen plugs have been installed and the hydrology stabilized for a period of five years without maintenance.

Monitoring and Maintenance: Monitoring is required to document the regeneration of volunteer vegetative species within the 31-acre pine plantation restoration site to ensure establishment of a hydrophytic community similar to the adjacent CBC. Initial monitoring occurs at the end of the first growing season following harvesting, and annually thereafter for 5 consecutive years. Monitoring will also document the regeneration of planted loblolly pine, and remediation involving the removal of loblolly pine seedlings, if necessary, will be done after the second and sixth year monitoring periods. The operating agreement says that: "Mitigation will be deemed successful, and vegetative monitoring will no longer be required, upon achievement of success criteria...." Installation and maintenance of earthen plugs is also the responsibility of CLC, and this obligation will continue until the plugs have stabilized for a period of five years without maintenance, or for as long as credits are being withdrawn, whichever is longer.

Long-Term Protection and Management: Long-term management of the site is the responsibility of CLC and is guaranteed by a conservation easement held by The Nature Conservancy. Under the conservation easement, CLC retains hunting rights, and will manage the site to promote wildlife habitat goals and associated recreational uses according to a regulator-approved management plan. The easement also stipulates that CLC will provide The Nature Conservancy with 10% of the credit sales revenues to cover the cost of enforcing this and other conservation easements.

Timing of Credit Sales: Twenty percent of credit capacity (or 144.76 credits) was made available for sale when the venture 404 permit was granted and the conservation easement executed with The Nature

***Case Studies of Selected
Operating Credit Ventures***

Conservancy. The remaining 80% of credit capacity is releasable for sale following the implementation of the restoration plan.

Financial Assurance/Contingency Plans: Financial assurance is not required. The venture operating agreement states:

If, at the end of the monitoring program, success criteria have not been met, CLC will consult with The Nature Conservancy, Corps, and other appropriate state and federal regulatory agencies to determine specifically what remedial action should be taken. If significant problems with restoration efforts are identified prior to the end of the monitoring program, regulatory agency personnel will be consulted regarding the advisability of taking remedial actions at that time. Remedial action may include planting, removal of non-native vegetation, grading, modification of hydrology and continued monitoring.

Current Status: Site construction was undertaken in 1994-1995. Natural hydrology has been re-established and the regeneration of volunteer vegetative species within the pine plantation restoration site is progressing. As of November 1995, approximately 30 to 40 venture credits had been sold. Regulators believe that the success of this bank to date owes to the fact that resource agencies had previously indicated that they were interested in protecting this property. There appears to be no divergent view as to the status (success) of this bank. [As of 1 August 1996, 100 venture credits had been sold.]

Other: Bank siting involved several stages and prospective sponsors. The Nature Conservancy identified the site as a higher quality CBC wetlands. Although the degraded site did not meet their requirements, the TNC thought it might be a good bank site. Subsequently, the South Carolina Highway Department attempted to purchase the site for use as a bank, but their negotiations were unsuccessful. The CLC then obtained an option to purchase the land and established a conservation easement with the TNC.

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Case Study 5: Venture Capitalized with a Combination of Capital Sources; Cost-Plus Financial Objective—Delta Land Trust

Location: Various prospective sites in Louisiana and Mississippi within the regulatory jurisdiction of the Corps Vicksburg District.

Credit Producer: Delta Land Trust (Delta), a non-profit entity that focuses on the reforestation and conservation of bottomland hardwood wetlands in the Mississippi Delta region.

Operating Agreement: CWA Section 404 general permit issued in October 1994 which incorporates the *Delta Mitigation Banking Program Agreement* signed by the Corps, USEPA, USFWS, Louisiana and Mississippi state regulatory and resource agencies, and Delta Land Trust.

Landowner: This venture is a mitigation program which can include multiple mitigation sites on privately-owned, prior-converted and farmed wetlands. Venture mitigation sites remain in private ownership but are subject to perpetual conservation easements held by Delta Land Trust. The Corps has third party enforcement rights on this easement.

Mitigation Plan: The mitigation program is for the restoration of prior-converted croplands and enhancement of farmed wetlands to establish forested wetland communities on different mitigation sites, each of which must be at least 100 acres. The proposed restoration plan for each venture site is furnished by Delta to the Corps for review and approval; implementation of approved restoration plans is the responsibility of Delta. The operating agreement states: "Delta shall complete tree planting on the entire mitigation bank tract during the first planting season following initial withdrawal of credits, unless planting is made technically infeasible by events such as flooding. If this occurs, planting will proceed as soon as practicable following such circumstances." All hydrological modifications, which may include removal of levees or dikes, plugging of drainage ways and breaking tile drains, must be completed no later than the fifth year following initial planting.

Market: Delta sites are limited to serving unavoidable CWA Section 404 and state permit impacts involving forested wetland communities.

Service Area: The operating agreement states that the venture is meant to

...compensate for unavoidable wetland impacts within the same watershed where appropriate and practicable. If replacement of functions and values is not practicable within the same watershed, the Vicksburg District may, if appropriate, allow mitigation outside of the watershed within its jurisdictional boundaries, preferably within an adjacent watershed similar to the areas where the losses occurred. In all cases mitigation will be performed in the state where losses occur.

Credit Evaluation and Trading: Delta Land Trust will provide in-kind replacement of forested wetlands only. Replacement (and impacted) wetlands will be subject to functional evaluation using the "Habitat

Case Studies of Selected Operating Credit Ventures

Evaluation Procedure” (HEP). Number of acres restored at a mitigation site multiplied by the net gain in habitat resulting from restoration (as measured in “average annual habitat units” which considers changes in habitat quantity and quality over time) will determine total available site credits. The Corps will determine the number of credits required for trades on case-by-case basis, but in all cases a minimum compensation of 1:1 defined in terms of acres will apply.

Success Criteria: Success criteria specific to each mitigation site will be set out in the approved restoration plan for each site. Restoration plans will require planting of at least 180 trees per acre, with a minimum of 125 trees per acre (including trees of the target species resulting from natural regeneration) surviving at year three and year five. Replanting may occur during year three and year five to achieve these standards. Hydrology must be re-established within two years of successful establishment of vegetation.

Monitoring and Maintenance: Delta Land Trust is responsible for monitoring and maintaining mitigation sites in perpetuity. Monitoring visits will occur annually to ensure compliance with the terms of conservation easements, restoration and management plans, and annual monitoring reports will be furnished to the Corps. If monitoring uncovers failure to meet success criteria or non-compliance with permit conditions, Delta must ensure that corrective actions, such as replanting and repair or replacement of water control structures, are undertaken.

Long-Term Protection and Management: Landowner participation in the venture requires donation of farmed wetlands and/or prior-converted wetlands to Delta via a conservation easement. The easement requires landowners to permanently and perpetually remove lands from farming and other development uses in order to return lands to forested wetlands. Landowners retain the right to engage in property uses that do not conflict with conservation uses, which include commercial fishing and hunting operations, and commercial timber harvesting subject to specific conditions. Delta Land Trust is responsible for enforcing the terms of the conservation easements.

Timing of Credit Sales: Some portion of site credit capacity is available for sale prior to site construction. Up to 50% of site credit capacity can be sold within the three year period following initial planting. At year three, the remaining 50% of credits can be released for sale if the Corps determines that success criteria relating to vegetation and hydrology have been achieved. If success criteria have not been achieved by year three, Delta must effect corrective actions, and replacement wetlands will be reassessed by the Corps in year five. If success criteria have been met by year five, the remaining credit capacity will be made available for sale.

Financial Assurance/Contingency Plans: Financial assurance is not required. Delta Land Trust is responsible for undertaking corrective actions, such as replanting and repair or replacement of water control structures, in the event of failure of mitigation sites to meet success criteria within the liability period. Delta is also responsible for ensuring compliance with all permit and conservation easement conditions. The operating agreement states: “The Vicksburg District may temporarily suspend the availability of credits or suspend the General permit...pending the return of the bank to conditions as specified in the easement and restoration and management plans.”

Current Status: As of November 1995, Delta Land Trust had not activated its permit due to the following concerns: (1) the provision which disallows credit sales for 50% of site credit capacity until the third year after

construction—Delta views this provision as creating too much demand-side uncertainty given potential changes to the wetland regulatory program that might occur with CWA re-authorization; (2) the requirement that sites be at least 100 acres in size; (3) prohibition from establishment of mitigation bank sites on publicly owned lands, given the acceptability of this practice as per the Federal Mitigation Bank Guidance (released November 1995); and (4) restrictions on timber harvesting that limit species composition/harvesting flexibility. Delta Land Trust is hopeful that the mitigation bank permits can be modified to reflect these concerns.

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Case Study 6: Venture Capitalized with a Combination of Capital Sources; Break-Even Financial Objective—Ohio Wetlands Foundation

Location: Hebron site in Licking County, Big Island site in Marion County, and other prospective sites throughout Ohio, including the North Ridgeville site in Lorraine County.

Credit Producer: The Ohio Wetlands Foundation (OWF), a private, not-for-profit entity established by the Ohio Home Builders Association to provide compensatory mitigation for 404 permit impacts.

Operating Agreement: *Agreement Between Ohio Department of Natural Resources (DNR), Division of Wildlife, and the Ohio Wetlands Foundation*, dated September 1992. The Corps Huntington District is not a signatory to the agreement, but all credit trades and mitigation activities involving 404 permits are subject to Corps approval and oversight. Once the Corps has given approval for a permit applicant to secure its required mitigation through OWF, the various parties establish a “Wetlands Participation Bank Agreement” which spells out mitigation requirements and responsibilities.

Landowner: Under the agreement between DNR and OWF, only state-owned lands will be used for OWF mitigation activities. The selection of mitigation sites is done jointly by OWF and DNR.

Mitigation Plan: The Hebron mitigation site involved the restoration of prior-converted croplands on a total of 33 acres. The Big Island site involved restoration of prior-converted croplands on 192 acres, and the enhancement of emergent marsh on 100 acres.

Market: The agreement places no restrictions on the types of 404 permit impacts that are eligible to participate in the mitigation program. However, the Corps Huntington District expects that it will only allow the venture to be used to effect mitigation for relatively minor wetland impacts involving 1 to 5 acres. The Hebron site

Case Studies of Selected Operating Credit Ventures

was used to provide mitigation solely for Nationwide Permit No. 26 (NWP 26) impacts, while the Big Island site is being used to provide mitigation for individual 404 permit impacts as well as NWP 26 impacts. All proposed uses of OWF by permit applicants are subject to Corps approval on a case-by-case basis.

Service Area: The agreement specifies that mitigation sites will be located in the same geographical regions in which wetland development impacts occur, and that efforts will be made to identify sites in all four quadrants of the state to ensure that mitigation is available for permitted impacts occurring statewide.

Credit Evaluation and Trading: Credits are defined in terms of acres of wetland type, and only in-kind trades are allowed. The Corps determines mitigation requirements on a case-by-case basis, but typically requires at least 1.5 acres of replacement wetlands for every acre of permitted wetland impact.

Credit Price: The first site charge of \$8,000 per acre turned out to be slightly less than actual cost. Their goal was to recover the costs of planning, design, and construction. Land is provided free of charge by DNR. All credit for one site must be sold at the same price. OWF has adjusted credit prices to \$12,000 per acre to incorporate a small surcharge contingency to reflect uncertainty (the goal is break-even).

Success Criteria: After OWF completes the implementation of regulator-approved mitigation work, DNR and the Corps review the site for compliance with the mitigation plan. OWF is responsible for correcting any site deficiencies uncovered at that time, or at any time during the five-year liability period.

Monitoring and Maintenance: Each mitigation site is subject to a five-year audit and monitoring (liability) period which begins immediately following site construction. OWF must monitor the site for problems and submit annual monitoring reports to DNR and the Corps.

Long-Term Protection and Management: Under the terms of the agreement with OWF, the Ohio DNR, Division of Wildlife will retain ownership of sites and is responsible for maintaining them in perpetuity. OWF provides Ohio DNR \$1000 per acre for maintenance.

Timing of Credit Sales: Once a mitigation site has been selected and a mitigation plan approved by DNR and the Corps, OWF may accept compensation fees from Corps-approved permit applicants which are then held in trust. When approximately one-half of the mitigation credits available from a site has been sold, OWF begins mitigation work. Credit sales can thus proceed before, during, as well as after mitigation work has been initiated and completed. For the first site (Hebron site), Ohio Homebuilders Association provided monies to OWF to fund construction prior to the credits sales.

Financial Assurance/Contingency Plans: Under the agreement with DNR, OWF is required to put \$500 into a "failure fund" for each acre of mitigation sold, not to exceed a total of \$25 thousand per mitigation site. OWF maintains and uses the fund to finance any remedial measures required by DNR or the Corps during the five-year liability period. No set conditions stipulate when OWF must tap into the fund for corrective actions.

Current Status: The Hebron site was constructed in the fall 1993 after approximately one-half of site credit capacity was sold. The site was completely sold out for NWP 26 impacts exclusively (33 acres). The Big Island site was constructed in the fall of 1994. About 100 acres of the 292 acre site have been sold or

committed. These sales involved NWP 26 impacts except for the sale of 17 acres to the Ohio Department of Transportation, which involved individual 404 permit impacts. As of November 1995, OWF was in the process of completing the development of mitigation design plans for a third site in the town of North Ridgeville, located in Lorraine County. [In August 1996, the third bank site was approved; the Corps Buffalo District was the signator.]

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CHAPTER FOUR. SUMMARY

- A wide variety of institutional arrangements are being utilized to implement wetland mitigation banking and make the practice available to third party users. Some arrangements can be easily characterized as “mitigation banks,” whereas others are not so easily classified. For the purposes of this study, mitigation banks and related forms are referred to as “mitigation supply ventures.”
- Since the Clinton Administration’s Wetland Plan was introduced in August 1993 (which supported the use of third party banks), the ventures that supply compensatory wetland mitigation to third party permit applicants have increased from approximately a half dozen to two dozen, as of Summer 1995, with many others almost ready for operation.
- Implementation is very spotty in geographic terms. The vast majority of banks are concentrated in the rapidly urbanizing areas of Florida, the southeast and middle Atlantic coast, central and southern California, and northeastern Illinois. Commercial mitigation banking (or similar ventures) has not yet been embraced by sponsors and/or regulators in many regions of the country.
- Bank sponsors indicate that the process to develop bank agreements has been very contentious to date, and, as a result, time consuming. There appears to be a need for:
 - (1) a model banking instrument;
 - (2) bank-related technical information transfer to field offices; and
 - (3) better application of consensus-building mechanisms and tools.
- At this point, only a few regions demonstrate the near-term possibility of having more than one venture in a “watershed” which could offer regulators and permit applicants varying options in terms of third party mitigation supply.
- This report has categorized compensatory mitigation supply ventures based on the source of capital and the financial objectives of the venture.
- This report examines six ventures in detail. The long-term ecological success of the case study ventures cannot yet be forecast due to the recency of their construction (all have been implemented since 1992). They appear to be capable of achieving ecological success. In most cases, the financial success cannot yet be gauged.



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**APPENDIX A.
INVENTORY OF COMMERCIAL
MITIGATION CREDIT SUPPLY VENTURES**

***Appendix A: Inventory of Commercial
Mitigation Credit Supply Ventures***

TABLE A-1. Operating Commercial Wetland Mitigation Ventures, Summer 1995

Bank Ventures	Location (city/county/state)	Banking instruments and Permits*		Source of Capital (Private, public, mitigation fees, combination)	Financial Objective (Maximize, break-even, subsidized)
		Type	Date		
North Atlantic Division					
Neabsco Wetland Bank	Neabsco Creek, Prince William Co., VA	MOA	13 Dec 94	Private	Maximize
White Cedar L. L. C.	Chesapeake (Great Dismal Swamp), VA	MOA	12 Jan 95	Private	Maximize
Virginia Wetlands Restoration Trust Fund	Generally Chesapeake Bay trib., Great Dismal Swamp, any county eligible, VA	MOU	Aug 95	Fees	Break-even
Maryland Non-Tidal Wetland Compensation Fund	MD	Permit	Jan 91	Fees	Break-even
South Atlantic Division					
Mitigation Solutions, Inc.	NW Duval Co., FL	Permit	10 Mar 95	Private	Maximize
Pembroke Pines (Florida Wetlandsbank)	Pembroke Pines, Broward Co., FL	Permit	28 Jun 93	Private	Maximize
Dade County\Bird Drive & North Trail Basins (an in-lieu fee program)	Everglades/Dade Co., FL	Permit	1989	Combination	Break-even
Vandross Bay Mitigation Bank	Lugoff, Wateree River, Kershaw Co., SC	Permit	27 Oct 94	Combination	Maximize
Friends Neck Wetland Mitigation Bank	Pee Dee River, Georgetown, SC	Permit	15 May 95	Private	Maximize
Millhaven Plantation (WET, Inc.)	Millhaven, Briar Creek, Savannah River, Screven Co., GA	Permit	18 Dec 92	Private	Maximize
North Central Division					
St. Charles	Otter Creek watershed, St. Charles, Kane Co., IL	Permit	12 Apr 94	Private	Maximize
Wadsworth	Wadsworth, IL, Des Plaines River watershed, Lake Co., IL	Permit	10 Apr 95	Private	Cost Plus
County of DuPage, Illinois	Addison, Illinois, DuPage River watershed, DuPage Co., IL	Permit	Oct 94	Combination	Break-even
Christian Properties (MN WCA Bank)	Sec 4, T120N, R23W, Wright Co., MN	Letter of Permission	10 Nov 93	Private	Maximize

* Only bank instruments or permits as signatory by Corps are identified. Non-Federal banking instruments and/or permits are not identified.

TABLE A-1. Operating Commercial Wetland Mitigation Ventures, Summer 1995 (continued)

Bank Ventures	Location (city/county/state)	Banking instruments and Permits*		Source of Capital (Private, public, mitigation fees, combination)	Financial Objective (Maximize, break-even, subsidized)
		Type	Date		
Ohio River Division					
Ohio Wetlands Foundation - Big Island and Hebron Sites	Scioto River, Marion Co., OH Licking River, Licking Co., OH	Letter of Permission	??	Combination	Break-even
North Pacific Division					
Astoria Airport Wetland Mitigation Bank	Clatsop Co., OR	MOA	Jan 86	Public	Break-even
West Eugene		??	??	Combination	Break-even
South Pacific Division					
Wildlands, Inc.	Sheridon (Bear River watershed), Placer Co., CA	Permit	14 Jul 94	Private	Maximize
Cottonwood Creek Mitigation Bank	Near Cottonwood, Cottonwood Creek, Sacramento River, Shasta Co., CA	Permit	28 Apr 94	Pubic	Break-even
Wikiup Mitigation Bank	Near Santa Rosa, Sonoma Co., CA	MOA	28 July 95	Private	Maximize
Bracut Marsh	Eureka, Humboldt Co., CA	MOU	1980	Public	Break-even
Lower Mississippi Valley					
Delta Land Trust	No sites selected yet	Final	21 Oct 1994	Combination	Cost Plus
Louisiana Nature Conservancy (Pine Flatwoods)	St. Tammany Parish, LA	Permit		Fee	Break-even
Cypress Island		??	??	Combination	Break-even

* Only bank instruments or permits signatory by Corps are identified. Non-Federal banking instruments and/or permits are not identified.

TABLE A-2. Proposed Commercial Wetland Mitigation Ventures, Summer 1995

Bank Ventures	Location (city/county/state)
North Atlantic Division	
Thomas L. Hance Mitigation Project	Prince Frederick, Calvert Co., MD
North East Mitigation Bank	Ford Run Watershed, Cecil Co., MD
Miller-Dobson Wetland Mitigation Bank	Mattawoman Creek, Charles Co., MD
Stancill's Sand & Gravel Wetland Mitigation Bank	Furnace Bay, Cecil Co., MD
Port Tobacco Wetland Mitigation Bank	Port Tobacco Creek, Charles Co., MD
Broadview Farms Wetland Creation	Zekiah Swamp watershed, Charles Co., MD
Bald Eagle Trust	Port Matilda, Bald Eagle Creek (North), Centre Co., PA
Hackensack Meadowlands Development Corporation	Hackensack River, incl. Bergen Co., NY
Woodbury Creek Wetland Mitigation Bank	West Deptford Township, Gloucester Co., NJ
Chimento	Oceanport, Monmouth Co., NJ
Clover Power Station Wetland Bank	Roanoke River floodplain, Halifax, VA
South Atlantic Division	
Lake Louisa & Green Swamp Mitigation Bank	Green Swamp, Lake Co., FL
Florida Rock Industries Mitigation Bank	Ft. Myers, Lee Co., FL
Poincianna Mitigation Bank	Lake Hatchinetta Basin, Polk Co., FL
Florida Power & Light South Dade Mitigation Bank	Everglades, Dade Co., FL
TFMTC-Dade County Wetland MitBank	East Everglades, Dade Co., FL

TABLE A-2. Proposed Commercial Wetland Mitigation Ventures, Summer 1995 (continued)

Bank Ventures	Location (city/county/state)
TFMTC-Lake Okeechobee Wetland MitBank	Lake Okeechobee, Glades/Henry Cos., FL
Little Pine Island Wetland Mitigation Bank	Matlacha Pass, Lee Co., FL
Split Oak Mitigation Bank	Orange Co., FL
East Central Florida Mitigation Bank - Ecobank	Chulauta, Seminole Co., FL
Mitigation Bank for Pine Savannah Wetlands in Coastal Mississippi	Lyman, Little Biloxi River (north of Gulfport), Harrison Co., MS
Grand Bay Mitigation Bank	Grand Bay Watershed, Sec. 8, T7S, R4W on MS/Al State line,
Marshlands Plantation	West of Woodbine, Satilla River, Camden Co., GA
Monastery Site	SW of Conyers, South River, Rockdale Co., GA
Croatan Wetland Mitigation Bank	New Bern, Neuse River Watershed, Craven Co., NC
Hidden Lake Wetland Mitigation Bank	Newfoundland, Albemarle Sound watershed, Tyrrell Co., NC
Neuse River Corridor Mitigation Bank	Goldsboro, Neuse River watershed, Wayne Co., NC
Scuppernong River Corridor Mitigation Bank	Columbia, Scuppernong River Watershed, Tyrell Co., NC
North Central Division	
Grand River Wildlife Area Mitigation Bank	GWRA, Farmington Township, Trumbull Co., OH
Orchard Hill Building Corp.	Orland Park, Illinois/Des Plaines River watershed, Cook Co., IL
Zumbro Wetlands Bank (Minnesota Wetland Conservation Act	SE1/4, Sec 30, T106N, R17W, Dodge Co., MN
Hobson Farm (MN WCA Bank)	Sec 29, T40N, R28W, Morrison Co., MN

TABLE A-2. Proposed Commercial Wetland Mitigation Ventures, Summer 1995 (continued)

Bank Ventures	Location (city/county/state)
Ohio River Division	
Coffee County Wetland Mitigation Bank	Near Manchester, Coffee Co., TN
North Pacific Division	
City & Bureau of Juneau Wetland Mitigation Bank	Juneau, Juneau Borough, AK
West Eugene Wetland Plan Mitigation Bank	West Eugene, Lane Co., OR
South Pacific Division	
Mystic Lake Mitigation Bank	Adjac San Jacinto River, City of San Jacinto, Riverside Co., CA
Santa Ana River Mitigation Bank	Santa Ana River, City of Riverside, Riverside Co., CA
Orchard Creek Associates	Orchard Creek (Bear River watershed), Placer County, CA
Sacramento County Vernal Pool Mitigation Bank	Morrison Creek watershed, Sacramento Co., CA
Vina Plains	Deer Creek, Tehama Co., CA
Valensin Ranch	Cosumnes River, Sacramento Co., CA
Medford Island	Sacramento-San Joaquin Delta, San Joaquin Co., CA
Klotz Property	Morrison Creek, Sacramento Co., CA
Southwestern Division	
Wetland Management, Inc.	East Fork Trinity River, Kaufman Co., TX
Katy-Cypress Mitigation Bank	Katy Prairie-Cypress Creek, Houston-Harris Co., TX
Galveston Bay Foundation Mitigation Bank	Bolivar, Bolivar Peninsula, Gulf Intracoastal Waterway, Galveston

TABLE A-2. Proposed Commercial Wetland Mitigation Ventures, Summer 1995 (continued)

Bank Ventures	Location (city/county/state)
Browning-Ferris Industries (BFI) Mitigation Bank	Katy-Prairie, Cypress Creek, Houston-Harris Co., TX
Garner's Bayou Mitigation Bank	Garners and Greens Bayous, Harris Co., TX
State of Arkansas	No site selected yet
Lower Mississippi Valley	
T.L. James	No sites selected yet
(not named) Benoit, MS (Tunica Co., Casino Ops)	North of Benoit, Bolivar Co., MS
(not named) Wolf River, TN	Wolf River & Shaws Creek watersheds, Fayette Co., TN



APPENDIX B. VENTURE SPONSORS AND REGULATORS INTERVIEWED

Steve Coker, Charleston Corps District
Greg Culpepper, Norfolk Corps District
Chris Dowling, Charleston Corps District
Steve Eggers, St. Paul Corps District
Mike Gheen, Huntington Corps District
Todd Gipe, Saint Johns Water Management District (Florida)
Elizabeth Guynes, Vicksburg Corps District
Bruce Henderson, Los Angeles Corps District
Phillip Hollis, Vicksburg Corps District
Brad Hubbard, Sacramento Corps District
John Jachke, Minnesota Board of Soil and Water Conservation
Lew Lautin, Florida Wetlandsbank
Richard Martin, The Nature Conservancy, Louisiana Chapter
Steve Martin, Norfolk Corps District
Mark Matusiak, Chicago Corps District
Jim Monroe, Sacramento Corps District
Michael Rolband, Wetland Solutions, Inc.
T. Logan Russell, Delta Environmental Land Trust
John Ryan, Land and Water Resources, Inc.
Vincent Squillace, Ohio Wetlands Foundation
Brooks Stillwell, WET, Inc.
Jacqueline Winkler, Philadelphia Corps District
David Zager, Ohio Wetlands Foundation

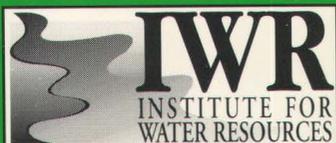
REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

Public reporting burden for this information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Service, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204 Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE August 1996	3. REPORT TYPE AND DATES COVERED	
4. TITLE AND SUBTITLE Commercial Wetland Mitigation Credit Ventures: 1995 National Survey			5. FUNDING NUMBERS	
6. AUTHOR(S) Scodari, Paul, and Robert Brumbaugh				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) King & Associates 1616 P Street, NW Washington, DC 20036			8. PERFORMING ORGANIZATION REPORT NUMBER IWR Policy Study 95-WMB-9	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) USACE, Water Resources Support Center Institute for Water Resources Policy and Special Studies Division Casey Building, 7701 Telegraph Road Alexandria, VA 22315-3868			10. SPONSORING/MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES Available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, (703) 487-4650				
12a. DISTRIBUTION/ AVAILABILITY STATEMENT Approved for public release; distribution unlimited			12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) Many recent banking arrangements involve commercial ventures developed by private entrepreneurs, non-profit entities, and public agencies to create mitigation credits for sale to permit applicants in need of compensatory mitigation. In the summer of 1995, the U.S. Army Corps of Engineers, Institute for Water Resources, asked the Corps Districts to provide information on operating and prospective commercial credit ventures in their regions. This report presents the results of this survey and includes information gathered in follow-up contacts, such as information on the specific markets served by ventures, the source of capital used for producing mitigation wetlands, and the financial objective of ventures. Finally, this report provides six detailed case studies of operating credit ventures that are representative of the different venture types identified. Several conclusions were drawn. A wide variety of institutional arrangements are being utilized to implement and make available wetland mitigation banking to third party users. Between 1993 and 1995, the ventures that supply these arrangements quadrupled. Implementation is very spotty, however, with the majority of banks concentrated in certain regions of the U.S. Among other things, there appears to be a need for a model banking instrument, to ease and speed the process of developing bank agreements.				
14. SUBJECT TERMS Wetland mitigation banking; wetland mitigation markets; compensatory mitigation; entrepreneurial banking; commercial banking; wetland management			15. NUMBER OF PAGES 55	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT Unlimited	

August 1996
IWR Report 96-WMB-9



National Wetland Mitigation Banking Study

This report is part of a series of reports that are being published during the National Wetland Mitigation Banking Study. Among the reports already published, in addition to this report include:

Wetlands Mitigation Banking Concepts IWR Report 92-WMB-1, July 1992, prepared by Richard Reppert, Institute for Water Resources. This report provides general background information and concepts pertaining to wetland mitigation banking.

Wetlands Mitigation Banking: Resource Document IWR Report 94-WMB-2, January 1994, prepared by the Institute for Water Resources and the Environmental Law Institute. This report presents detailed case study histories and an annotated wetland mitigation banking bibliography.

Expanding Opportunities for Compensatory Mitigation: The Private Credit Market Alternative IWR Report 94-WMB-3, January 1994, prepared by Leonard Shabman, Dennis King, and Paul Scodari. This study looks at economic forces affecting markets for mitigation credits.

First Phase Report IWR Report 94-WMB-4, January 1994, prepared by Robert Brumbaugh and Richard Reppert, Institute for Water Resources. Presents findings of phase one of the National Study.

Examination of Wetland Programs: Opportunities for Compensatory Mitigation IWR Report 94-WMB-5, March 1994, prepared by Apogee Research, Inc. Sixty-eight programs that conduct or facilitate wetland restoration or creation were identified that might be applicable to compensatory wetland mitigation. Fourteen programs were profiled in more detail.

Wetland Mitigation Banking IWR Report 94-WMB-6, February 1994, prepared by the Environmental Law Institute (ELI). The U.S. EPA and IWR co-funded this report that examines wetland mitigation banking experience in detail. (This is a very slight revision of a report published by ELI in 1993).

Commercial Wetland Mitigation Credit Markets: Theory and Practice IWR Report 95-WMB-7, November 1995, prepared by Paul Scodari, Leonard Shabman, and David White. This report examines existing and proposed commercial ventures (e.g., wetland mitigation banks) and area-wide and watershed rules governing the operation of commercial credit markets.

Watershed-based Wetlands Planning: A Case Study Report IWR Report 95-WMB-8, December 1995, prepared by David White and Leonard Shabman. The case studies of watershed-based wetlands planning illustrate a range of planning approaches and issues important to consider when undertaking watershed-based planning.

For further information on the National Wetland Mitigation Banking Study, contact either:

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REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188	
Public reporting burden for this information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Service, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204 Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.				
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			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT Unlimited	



*NATIONAL WETLAND MITIGATION
BANKING STUDY
Commercial Wetland Mitigation
Credit Ventures: 1995 National Survey*

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EXECUTIVE SUMMARY

Federal wetland regulations pursuant to Section 404 of the Clean Water Act (CWA) require applicants for wetland discharge permits to satisfy "mitigation sequencing" rules as a precondition for permitting. Mitigation sequencing requires permit applicants to first avoid and minimize wetland impacts to the extent practicable, and then provide compensatory mitigation for any remaining wetland impacts. Compensation is expected in the form of wetlands created from uplands, the restoration of former or severely degraded wetlands, or the enhancement of functioning wetlands.

While Federal wetland regulations state a preference for mitigation to be constructed at or contiguous to the site of the permitted discharge, in recent years regulators have increasingly allowed permittees to proceed with required mitigation "off-site." One form of off-site mitigation is *mitigation banking*. Mitigation banks are typically large areas of replacement wetlands created for the express purpose of providing compensatory mitigation for more than one wetland development project. Most of the mitigation banks currently in operation were each developed by a single large public or private entity to provide only for its own mitigation needs. In recent years, however, interest in mitigation banking has shifted from such "single-user" mitigation banking to commercial mitigation banking. Many recent arrangements proposed and established involve commercial ventures developed by private entrepreneurs, non-profit entities, and public agencies to create mitigation credits (some measure of wetland area and functioning) for sale to the general universe of permit applicants in need of compensatory mitigation. These commercial operations include the so-called "in-lieu fee systems" in which regulators have allowed permit applicants to pay a

mitigation fee to a third party in lieu of the direct provision of compensatory mitigation. This report refers to all such commercial mitigation operations as commercial *credit ventures*, and the sale of mitigation credits from credit ventures to applicants for CWA Section 404 permits is termed commercial *credit trading*. The distinguishing feature of this mitigation option is that the approved sale and use of mitigation credits transfers legal and financial responsibility for the fulfillment of mitigation requirements from permittees to credit ventures.

Over the last few years, this regulatory innovation has been advancing steadily in many areas of the country. In the summer of 1995, the U.S. Army Corps of Engineers, Institute for Water Resources (IWR), asked the various Corps District regulatory offices to provide information on operating and prospective commercial credit ventures in their respective areas. The survey was conducted as part of IWR's *National Wetland Mitigation Banking Study*.

This report presents the results of the nationwide survey of commercial credit ventures and credit trading within the CWA Section 404 program and includes information gathered in follow-up contacts with Corps District regulators and the sponsors of operating credit ventures. In the summer of 1995, 77 ventures were identified that meet the definition of commercial credit ventures used here. Of these 77 ventures, 24 were in operation; the others reflect prospective ventures that were either proposed or in planning at that time. Of the 11 Corps Divisions, the South Atlantic Division has seen the most activity in terms of commercial credit supply, with a total of 23 operating and prospective ventures. Six of the

Executive Summary

ventures in the South Atlantic Division were in operation.

The survey results suggest that a very large share of the nationwide development of this regulatory innovation is occurring in areas of the country for which regional guidance or rules for commercial credit trading have been developed. For example, Maryland, Florida, and Minnesota have developed state rules for commercial credit trading. Similarly, various Corps Districts, including the Chicago and Galveston Districts, have developed regulatory guidance for their respective jurisdictions. More than one-third of all operating and prospective ventures identified by the survey (eight operating and 23 prospective ventures) are located in these states and Corps Districts. Other areas in which there has been substantial development activity include California (four operating and eight prospective ventures), the Mississippi Delta region (three operating and two prospective ventures), and Virginia (three operating and one prospective venture).

The survey also elicited information on the specific markets (expected to be) served by ventures, the source of capital (expected to be) used for producing mitigation wetlands, as well as the financial objective of ventures. With respect to type of markets served, eleven (approximately 14%) of the identified ventures are or will be limited to providing compensatory mitigation for CWA Section 404 Nationwide permit (NWP) impacts, primarily NWP No. 26. Many of the other identified ventures may also focus on NWP impacts, but are or will not be limited exclusively to that market type of use. With respect to source of production capital, about 32 (41%) of the identified ventures are or are expected to be capitalized exclusively with private resources.

With respect to financial objective, the survey results suggest that 50 ventures (64%) pursue a “maximize-return” or “cost-plus” financial objective, where the former means that ventures

will price credits so as to maximize the difference between credit revenues and production cost, and the latter means that ventures will price credits so as to generate a small profit over production costs. The other 27 ventures pursue a “break-even” financial goal, whereby they will price credits so that credit sales revenue will just cover production costs.

The report uses the source of capital and financial objective variables as classifiers to define 12 possible types of credit ventures, and uses this taxonomy to classify and review the 24 operating credit ventures identified by the survey. Nine of the operating credit ventures are capitalized exclusively with private resources, all of which represent private sector operations which seek to maximize net return on investment. Three operating ventures were developed and capitalized exclusively with public resources, and pursue a break-even financial goal. Three of the operating ventures are capitalized exclusively with mitigation fee revenues, and pursue a break-even financial objective. Nine of the operating ventures are capitalized by a combination of capital sources. Two of these pursue a maximize-return financial objective, and another two have a cost-plus financial objective. The other five operating ventures that are capitalized with a combination of capital sources all pursue a break-even financial objective.

Chapter 3 provides detailed case studies for six of the operating credit ventures that are representative of the different venture types identified by the venture taxonomy developed in Chapter 2. The ventures chosen for case study analysis illustrate a wide range of venture institutional forms and operating characteristics. The following banks served as case studies: *St. Charles* (IL), *Cottonwood Creek* (CA), *Pine Flatwood* (LA), *Vandross Bay* (SC), *Delta Land Trust* (MS, LA), and the *Ohio Wetlands Foundation*. The case studies provide summary information on the following venture elements: location, credit

producer, operating agreement, landowner, mitigation plan, market, service area, credit evaluation and trading, credit price, success criteria, monitoring and maintenance, long-term protection and management, timing of credit sales, financial assurance/contingency plans, and current status.

Bank sponsors indicate that the process to develop bank agreements has been very contentious to date, and, as a result, time consuming. There appears to be a need for:

- (1) a model banking instrument;
- (2) bank planning and technical information transfer to field regulatory offices; and
- (3) better application of consensus building mechanisms and tools.

The long-term ecological success of the case study ventures cannot yet be forecast due to the recency of their construction. They appear, at this point, to be capable of achieving ecological success.



ACKNOWLEDGMENTS

This report was prepared as part of the National Wetland Mitigation Banking Study conducted by the Institute for Water Resources (IWR), U.S. Army Corps of Engineers (Corps). Section 307(d) of the Water Resources Development Act of 1990 provided authority to the Assistant Secretary of the Army for Civil Works for the study.

The National Wetland Mitigation Banking Study is conducted within the IWR Policy and Special Studies Division, whose chief is Eugene Z. Stakhiv. This report and the national study has benefitted from Dr. Stakhiv's review and guidance throughout the course of the ongoing study. Kyle E. Schilling is the director of IWR. The study is overseen by the Policy Review and Analysis Division and the Regulatory Branch, Operations, Construction and Readiness Division within the Directorate of Civil Works of the Headquarters of the U.S. Army Corps of Engineers (HQUSACE). The national study is managed by Dr. Robert Brumbaugh, IWR.

This report was prepared by Paul Scodari (King and Associates, Washington, DC) and Robert Brumbaugh.

The First Phase Report of the National Study recognized that the greatest opportunity for banking was for the practice to be available to the "every-day" permit applicant that requires compensatory mitigation. The National Study Report Commercial Wetland Mitigation Credit

Markets: Theory and Practice (IWR Report 95-WMB-7) discusses issues associated with the provision of compensatory mitigation commercially, that is, to third party permit applicants. The report examined regulatory influences on the ecological and economic success of commercial ventures.

In the time since that report was prepared (Summer 1995), many ventures have been started-up and many others proposed. This report provides the first summary of the status of commercial ventures since the involvement of the entrepreneurial private sector.

IWR conducted a survey of Corps Districts with the assistance of HQUSACE Regulatory Branch. Basic inventory information was provided by the district. IWR tasked Paul Scodari with gathering additional information for selected banks in the preparation of brief case studies. Relevant participants involved in the planning of the case study mitigation banks and interviewed for these case studies are listed in Appendix B.

Thanks are extended to Leonard Shabman (Virginia Tech) and Jack Chowning (Corps HQUSACE Regulatory Branch) who reviewed drafts of this report and Sue Elston (EPA Region V, Chicago) who reviewed portions of this document. Ms. Catherine Lisle provided editorial assistance for the draft report. Thanks are also extended to all Corps District staff who provided information in the 1995 inventory.





CHAPTER ONE. INTRODUCTION

Federal wetland regulations pursuant to Section 404 of the Clean Water Act (CWA), as well as many state and local regulatory programs, require applicants for wetland discharge (dredge or fill) permits to satisfy “mitigation sequencing” rules as a precondition for permitting. Mitigation sequencing requires permit applicants to first avoid and minimize wetland impacts to the extent practicable, and then provide compensatory mitigation for any remaining wetland impacts. Compensation is typically, but not always, expected in the form of wetlands restored from former or severely degraded wetlands, or created from uplands or deep water habitat.

Wetland regulations generally state a preference for mitigation to be constructed at or contiguous to the site of the permitted discharge in order to compensate for the specific wetland functions and values lost due to development. But since such “on-site” mitigation is not always feasible or environmentally desirable due to surrounding development which may compromise the long-term viability of replacement wetlands, regulators have increasingly allowed permit applicants to proceed with required mitigation “off-site.”

One form of off-site mitigation is *mitigation banking*. Mitigation banks are typically large areas of replacement wetlands created for the express purpose of providing compensatory mitigation for more than one wetland development project. The use of mitigation banks can often streamline the permitting process, and the large-scale replacement wetlands they provide can often more effectively create and maintain wetland functioning than many smaller, and often isolated, on-site mitigation projects.

Most of the mitigation banks currently in operation were each developed by a single large public or private wetland developer to provide only for its own mitigation needs.¹ In recent years, however, interest in mitigation banking has expanded from such “single-user” mitigation banking into the arena of commercial mitigation banking. Many of the mitigation banking arrangements proposed and permitted in recent years involve commercial ventures developed by private entrepreneurs, non-profit entities, or public agencies to create mitigation credits (some measure of wetland functioning and/or area) for sale to the general universe of permit applicants in need of compensatory mitigation. These commercial operations include the so-called “in-lieu fee” systems in which regulators have allowed permit applicants to pay a mitigation fee in lieu of the direct provision of compensatory mitigation. Fee revenues are accumulated in trust and dedicated to the future construction of large-scale mitigation projects by public agencies or non-profit conservation entities.

This report refers to such mitigation operations as commercial *credit ventures*. The sale of mitigation credits from credit ventures to applicants for CWA Section 404 permits is termed commercial *credit trading*. The distinguishing feature of this mitigation option is that the approved sale and use of mitigation credits transfers legal and financial liability for the fulfillment of mitigation requirements from permittees to credit ventures.

¹ See: U.S. Army Corps of Engineers, Institute for Water Resources. 1994. *The National Wetland Mitigation Banking Study: First Phase Report*. Prepared by Robert Brumbaugh and Richard Reppert, Institute for Water Resources. IWR Report 94-WMB-4.

Introduction

This transfer of liability for compensatory mitigation requirements could potentially enable regulators to concentrate their limited oversight and enforcement resources on a much smaller number of mitigation sites and responsible parties.

Over the last several years this regulatory innovation has been advancing steadily in many areas of the country. The Clinton Administration's August 1993 Wetland Plan has coincided with and greatly enhanced the emergence of commercial banking (White House 1993). Prior to 1992, there were no entrepreneurial banks and only two publicly sponsored commercial banks (Brumbaugh 1995). The recently released Federal Mitigation Banking Guidance should further enhance development of commercial banking (Federal Register 1995).

In the summer of 1995, the U.S. Army Corps of Engineers (Corps), Institute for Water Resources (IWR) surveyed Corps District regulatory offices to obtain information on operating and prospective commercial credit ventures in their respective areas. The survey was conducted as part of IWR's *National Wetland Mitigation Banking Study*.²

The District offices were asked to complete a short survey form for each venture that solicited information on: (1) venture name, sponsor, and location; (2) venture status; (3) the source of resources (to be) used by the venture for capitalizing mitigation work; (4) the types of permitted impacts (to be) served by the venture, and (5) whether the venture was (is being) established under some type of area-wide rules or guidance for commercial credit trading.

Purpose and Scope

This report uses the survey results, and information gathered in follow-up contacts with District regulators and the sponsors of operating ventures, to organize and present information on the nationwide development of commercial credit ventures and credit trading within the 404 program. This information is provided in three parts.

First, the report presents a summary review of the development of credit ventures nationwide using the information directly gathered in the IWR survey. This review summarizes the general survey results regarding the number of credit ventures operating, proposed, and in planning in different areas of the country; the types of fill permits that ventures were (are being) developed to serve, and; the source of capital for and financial objectives of ventures. The summary also discusses how the development of area-wide rules or guidance for commercial credit trading in certain parts of the country has affected the development of credit ventures.

Second, the report identifies and provides an overview of those surveyed ventures that were in operation as of summer 1995. These ventures are classified and reviewed according to a taxonomy developed in a previous research effort for the *National Wetland Mitigation Banking Study*.³ This taxonomy helps to illustrate and facilitate discussion of the wide range of institutional forms and operating characteristics of operating credit ventures.

Third, the reports provides case studies for six operating credit ventures which are representative

³Paul Scodari, Leonard Shabman, and David White. 1995. *Commercial Wetland Mitigation Credit Markets: Theory and Practice*, U.S. Army Corps of Engineers, Institute for Water Resources. IWR Report 95-WMB-7.

² See: Institute for Water Resources, note 1.

of the different types of ventures defined by the venture taxonomy. These case studies provide more detailed information on the development, operation, and use of established credit ventures in different areas of the country.

The general survey results and the classification and overview of operating credit ventures is provided in Chapter 2. The case studies of individual ventures is presented in Chapter 3.



CHAPTER TWO. OVERVIEW OF SURVEY RESULTS

This chapter provides an overview of the survey results regarding the development of commercial credit ventures nationwide. It also classifies and discusses those ventures which were identified as being in operation when the survey was conducted. Operating ventures are defined here as credit ventures which have operating agreements authorized by the Corps under the CWA Section 404 program.⁴ This survey also includes other ventures that are, or have been, utilized to fulfill Section 404 compensatory mitigation requirements. A venture operating agreement may be in the form of a Section 404 permit and/or some form of interagency-agreement signed by the Corps.

Field Response to Survey

The Corps field offices identified more than 100 ventures. For the purpose of this study, those that did not meet the definition of a commercial credit venture adopted here were excluded. For example, those ventures which were developed by a sponsor to provide for its own mitigation needs, but which subsequently offered excess credits for sale to third parties, were culled from the final list.⁵ Similarly, mitigation operations in which permittees were

allowed to pay another party to produce their mitigation requirements off-site, but for which the payment did not transfer legal responsibility for compensatory mitigation, were also excluded. The final list includes 77 ventures that meet the definition of commercial credit ventures used here. Of these, 24 were in operation as of summer 1995; the others reflect prospective ventures that were either proposed or in planning at that time. The location, sponsorship, and other basic information of these ventures are presented in Appendix A. The general location of operational and proposed ventures are shown in Figure 1.⁶

Of the 11 Corps Divisions, the South Atlantic Division has seen the most activity in terms of commercial credit supply, with a total of 23 identified operating and prospective ventures.

South Atlantic Division	23
North Atlantic Division	17
South Pacific Division	12
North Central Division	8
Lower Mississippi Valley Division	6
Southwestern Division	6
North Pacific Division	3
Ohio River Division	2

In terms of operating ventures, the South Atlantic Division also leads the way:

South Atlantic Division	6
North Atlantic Division	4
South Pacific Division	4

⁴ There may be other operating banks permitted by non-Federal entities, but neither permitted by the Corps nor with permitted use by the Corps.

⁵ Examples of this type of venture, identified by the initial survey, but excluded from this study, include Cañada Gobernadora (CA) and Aliso Creek Wildlife Enhancement Project (CA). While they may sell credits (i.e., provide compensatory mitigation) to other permit applicants, both were established primarily to compensate for the sponsoring land development company mitigation requirements.

⁶ This survey includes only those venture identified by the Corps districts or known to the authors at that time. Undoubtedly, there were other ventures in some stage of planning, as well as non-Federally authorized operating ventures.

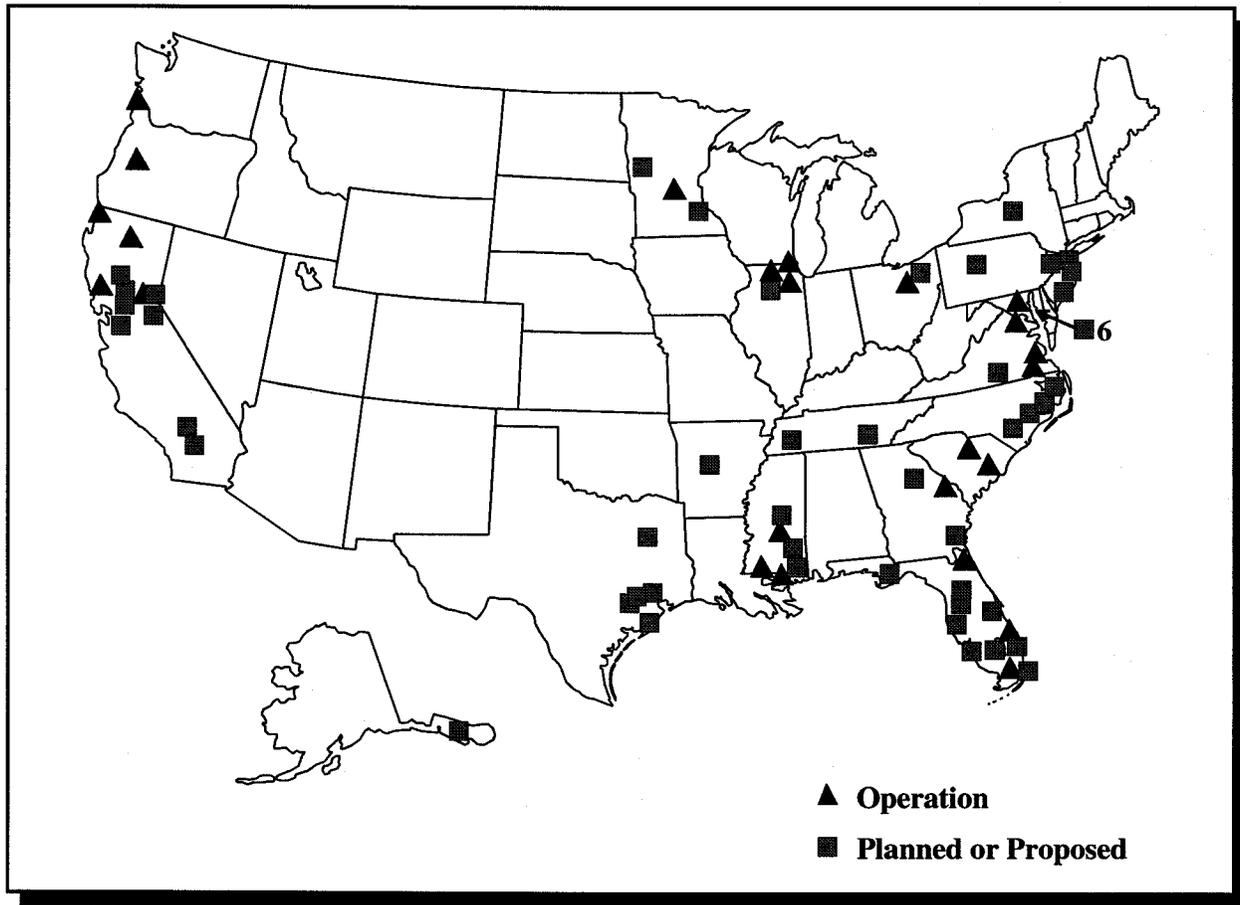


Figure 1. Commercial Wetland Mitigation Ventures, July 1995

Lower Mississippi Valley Division	3
North Pacific Division	2
Ohio River Division	1

The survey results suggest that a very large share of the nationwide development of this regulatory innovation is occurring in areas for which area-wide rules or guidance for commercial credit trading have been developed. For example, Maryland, Florida, and Minnesota have developed state-wide rules for commercial credit trading. Similarly, various Corps Districts, including the Chicago and Galveston Districts, have developed regulatory guidance for their respective

jurisdictions.⁷ More than one-third of all operating and prospective ventures identified by the IWR survey (eight operating and 23 prospective ventures) are located in these states and Corps Districts.

The explosive manner in which this concept is being implemented in Florida is demonstrated by the fact that when the survey was conducted in July 1995, the Corps identified 12 operating or planned ventures. By late February 1996, the State of Florida Department of Environmental Protection

⁷ For a detailed discussion of these area-wide rules for commercial credit trading, see: Scodari et al., note 3.

(DEP) listed 32 commercial mitigation credit supply ventures in their system—7 permitted, 16 pending, and 9 in a pre-application stage (Florida DEP, 1996a). By the end of August 1996, the number of permitted ventures had already increased to ten (Florida DEP, 1996b).

Other areas in which there has been substantial development activity include California (four operating and eight prospective ventures), the Mississippi Delta region (three operating and two prospective ventures), and Virginia (three operating and one prospective venture). In addition, a number of the identified operating and prospective ventures were associated with localities which have developed watershed management plans that include provisions for commercial credit trading. These include Juneau (AK), West Eugene (OR), Hackensack (NJ), Dade County (FL), and DuPage County (IL).⁸

The survey questionnaire also solicited information on the markets (expected to be) served by ventures, the source of capital (expected to be) used for producing replacement wetlands, as well as the financial objectives of ventures. The aggregate survey results with respect to these variables are reviewed briefly below. These results should be viewed as preliminary only, since many of the identified ventures are still early in the planning stage.

With respect to markets served, the survey results suggest that approximately 14% (eleven) of the identified ventures are or will be limited to providing compensatory mitigation for CWA Section 404 Nationwide permit (NWP) impacts, primarily NWP No. 26. Many of the other ventures also will focus on the NWP market, but

are or will not be limited exclusively to that market.

With respect to source of capital, about 41% (32) of the identified ventures were or are expected to be capitalized exclusively with private resources, and approximately 5% (four) were or are expected to be capitalized exclusively with public resources. Another 9% (7) indicated they are or will be capitalized exclusively with mitigation fees charged to permit applicants. The remaining ventures (45% or 34 ventures) are or will be capitalized with a combination of capital sources.

Finally, the survey results indicate that about two-thirds (50) of the identified ventures pursue a “maximize-return” or a “cost-plus” financial goal. The other one-third (27 ventures) pursue a “break-even” financial goal. Definitions for these financial objectives of credit ventures are provided below.

Operating Credit Ventures

A general classification system frequently used to differentiate among commercial credit ventures⁹ divides credit ventures into two broad types: commercial mitigation banks and in-lieu fee systems. Under such a classification, commercial banks are defined as commercial off-site mitigation operations in which the replacement wetlands are at least in part created in advance of credit sales to permittees. Fee systems (also sometimes called “mitigation trusts”) have been defined as arrangements in which certain permittees are charged fees in lieu of the direct provision of compensatory mitigation by the permittee. Fee revenues are accumulated in a dedicated fund that is intended to be used at some future date for the construction of large-scale replacement wetlands.

⁸ For a detailed discussion of these local watershed management plans, see: David White and Leonard Shabman. 1995. *Watershed Based Planning: A Case Study Report*. IWR Report 95-WMB-8, U.S. Army Corps of Engineers, Institute for Water Resources.

⁹ Institute for Water Resources, note 1.

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In effect, this classification distinguishes commercial mitigation banks from fee systems according to the time when replacement wetlands are provided relative to the time that credits are sold or mitigation fees charged: banks are assumed to provide “advanced mitigation” while fee systems are not. However, this assumes that the concept of advanced mitigation can be precisely defined. To some, advanced mitigation means the provision of fully functioning wetlands before credits sales are allowed. However, very few of the off-site mitigation systems developed to date, including “single-user” banks, have met this standard.¹⁰ The experience with commercial credit trading suggests that while all operating credit ventures provide some level of advanced planning for the provision of replacement wetlands, there is substantial variation in the timing of actual mitigation work (as well as the maturation of replacement wetlands provided) relative to the time at which credit sales are allowed.

An earlier research effort for the *National Wetland Mitigation Banking Study* developed a more descriptive taxonomy that better illustrates the range of institutional forms and operating characteristics of commercial credit ventures.¹¹ That taxonomy is presented and used in Table 1 to classify the operating ventures identified in the IWR survey. The Table 1 matrix uses two variables as classifiers: (1) financial objective and (2) source of capital.

The financial objective classifier relates to how credit ventures price credits relative to their commercial production costs. Table 1 shows three possible financial objectives of credit ventures: maximize-return, cost-plus, and break-even. A credit venture whose financial objective is to *maximize return* will price credits so as to maximize the difference between its total sales revenue and commercial cost of production.

Ventures sponsored by for-profit private sector firms would be expected to seek this financial outcome. A venture that adopts a *cost-plus* financial goal will price credits so as to generate a “small” profit over commercial cost, usually established as a percentage of total cost. A venture might adopt a cost-plus objective if, for example, it is sponsored by a non-profit conservation entity that wants to earn a small financial surplus to be used for watershed restoration activities in a broader context. Finally, a credit venture that adopts a *break-even* financial objective will price credits so that its sales revenue will just cover its commercial production cost. A government-sponsored credit venture, for example, might adopt a break-even financial objective to promote economic development by ensuring that mitigation costs to permittees are no higher than necessary. Because many government entities are prohibited by law from seeking profits, publicly-sponsored credit ventures often may be required to accept credit prices that just equal production costs.

The source of capital classifier refers to the origins of the production inputs of land, equipment and materials, and management used to produce replacement wetlands. These production inputs might already be owned by a venture sponsor, or might need to be purchased or leased. Table 1 shows four possible sources of capital: private sector resources, public sector resources, dedicated mitigation fee revenues, and some combination of these sources.

The private and public capital source categories identify ventures that commit private or public resources, respectively, to the production of replacement wetlands *prior* to the initial sale of credits. These capital source categories include ventures that are required to construct replacement wetlands *or* to post financial assurances for mitigation work as a precondition for credit sales.

¹⁰ Institute for Water Resources, note 1.

¹¹ Scodari, et al., note 3.

TABLE 1. Commercial Wetland Credit Ventures Taxonomy*
(Operating ventures—permitted by Corps or used by Corps permit applicants as of 1995)

FINANCIAL OBJECTIVE	SOURCE OF CAPITAL			
	PRIVATE CAPITAL	PUBLIC CAPITAL	MITIGATION FEE REVENUE	COMBINATION
MAXIMIZE NET RETURN (maximize difference between revenue and commercial cost)	Pembroke Pines (FL) Mitigation Solutions (FL) St. Charles (IL) Millhaven (GA) Neabsco (VA) White Cedar (VA) Christian Properties (MN) Wildlands (CA) Friends Neck (SC)			Wikiup (CA) Vandross Bay (SC)
COST PLUS (recover something over commercial cost)				Delta Land Trust (MS, LA) Wadsworth (IL)
BREAK EVEN (recover commercial cost)		Cottonwood Creek (CA) Astoria Airport (OR) Bracut Marsh (CA)	Pine Flatwood (LA) Maryland Nontidal Wetland Fund Virginia Restoration Trust	DuPage County (IL) Dade County (FL) West Eugene (OR) Ohio Wetlands Foundation (OH) Cypress Island (LA)

* This taxonomy was presented in an earlier report by Scodari et al. 1995. The categorization of some of these ventures has changed since that report, in part owing to more information.

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The mitigation fee revenue source category identifies those ventures in which all of the commercial resources used to capitalize credit production—including land—are paid for entirely with mitigation fees charged to permittees. These ventures necessarily do not involve any up-front commitment of capital for producing replacement wetlands relative to the time at which mitigation fees are charged to permittees.

Finally, some ventures rely on a combination of capital sources for the production of replacement wetlands. This category includes ventures that rely on public lands for mitigation siting which is provided free of charge,¹² but for which all other inputs are paid for with private capital or mitigation fee revenues. This venture category also includes ventures which rely at least in part on revenues from up-front credit sales to finance mitigation work *and* were not required to post financial assurances in return for the ability to sell credits prior to mitigation construction. In this case the right to engage in “early” credit sales is not backed by the up-front commitment of private (public) capital in the form of financial assurances. These ventures in essence are capitalized *in part* with mitigation fee revenues.

The Table 1 matrix uses the two classifiers discussed above to identify a total of 12 possible types of credit ventures, half of which are represented by at least one of the operating ventures identified by the IWR survey. An overview of these operating ventures follows below.

Ventures Capitalized with Private Resources

The IWR survey identified a total of nine operating ventures that are capitalized exclusively with

¹² In these cases, however, some sponsors may provide funds to the public entity, e.g., in the form of an endowment, for long-term management.

private resources, all of which represent private sector operations which seek to maximize net return on investment. These include Millhaven (GA), Pembroke Pines (FL), Mitigation Solutions (FL), St. Charles (IL), Friends Neck (SC), Neabsco (VA), White Cedar (VA), Wildlands (CA), and Christian Properties (MN).

The *Millhaven* venture (also known as *WET, Inc.*), which received its 404 operating permit in 1992, was the first private commercial credit venture to receive Corps approval. Millhaven’s permit requires the completion of mitigation work, as well as the posting of financial assurance for mitigation success, as a precondition for credit sales. Once the Corps makes a “preliminary determination of hydrology” for a restored parcel, the venture is then allowed to sell one-half of the credits generated by that parcel. The remaining credits can then be released for sale upon a final determination of hydrology by the Corps. As of November 1995, Millhaven had completed mitigation work for 80 to 100 acres and the Corps had made a preliminary determination of hydrology for 60 acres, enabling the venture to sell 30 acres worth of credits. However, the venture had only sold six acres of credits as a result of factors which had limited credit demand. These factors include a sponsor-perceived regulatory bias for on-site mitigation in the case of 404 individual permits. Further, until very recently, the Corps Savannah District generally did not require mitigation for Nationwide permit (NWP) impacts. The Savannah District is now requiring mitigation for NWP impacts greater than three to four acres, and credit sales to such permittees are expected in the near future.

Pembroke Pines, Mitigation Solutions, Friends Neck, and St. Charles were each allowed to proceed with credit sales prior to the construction of replacement wetlands, but, in return for this opportunity, were required to post financial assurances as a precondition for credit sales. The *Pembroke Pines* venture (also known as *Florida*

Wetlandsbank) proceeds with mitigation work in discrete phases immediately following the sale of credits for projects permitted pursuant to 404 individual permits as well as state and local permit programs. *Pembroke Pines*' state-issued operating permit was developed in conformance with the Florida state rules for commercial credit trading promulgated in 1994.

The *Mitigation Solutions* venture, which was also established in conformance with the Florida state rules, received its operating permit in 1995. As of November 1995, the venture had sold credits for several project impacts associated with state permits and 404 Nationwide permits, for which it was required to post financial assurance for mitigation construction and success. As of that date, site construction except for planting had been completed.

The *Friends Neck* venture, which received its operating permit in 1995, was also required to post financial assurances in return for right to sell a limited portion of credit capacity for 404 individual and Nationwide permit impacts prior to the construction of replacement wetlands. The venture has been debited and, as of November 1995, site construction was underway.

The *St. Charles* venture was developed pursuant to area-wide rules for commercial credit trading set forth in the *Interagency Coordination Agreement on Mitigation Banking within the Regulatory Boundaries of Chicago District, Corps of Engineers* (ICA). Pursuant to the ICA, *St. Charles* was allowed to sell 30% of credit capacity prior to site construction. The site was constructed and planted in 1994 and, under the terms of the ICA, is now allowed to sell 70% of credit capacity. As of November 1995, the *St. Charles* venture had sold somewhat less than the allowable amount, primarily for projects permitted under NWP 26.

All of the other ventures included in this venture class were required to construct replacement

wetlands prior to credit sales, and were not required to post financial assurances for mitigation work. The *Wildlands*, *Neabsco*, and *White Cedar* ventures were each required to achieve certain success criteria for replacement wetlands prior to credit sales. The operating permits for these ventures also limit credit sales within the 404 program to NWP impacts, and each is being constructed in stages.

The final venture listed in this category—*Christian Properties*—is part of a state-wide mitigation program developed under the Minnesota Wetland Conservation Act of 1991 to provide a ready supply of compensatory mitigation for the state permit program. Under the state-wide program, private landowners and local government entities can create or restore wetlands on lands they own in order to produce mitigation credits. Six months must pass after the completion of wetland restoration (one year for wetland creation) before “local government units” will approve site credits for deposit into the state bank. The owners of credit deposits are called “account holders,” who are free to use their credits for their own mitigation needs or to sell them to others in need of compensatory mitigation under the state regulatory program.

As of November 1995, approximately 40 individual account holders accounted for over 700 acres of wetland credit deposits into the state program, and another 50 accounts associated with potential and commenced restoration projects would add over 3000 acres of credits to the program when complete. Account holders include private individuals as well as state and county highway departments, and other local government entities. Most state and county highway department account holders plan to use their credits for their own mitigation needs, although some counties may eventually sell some credits to private landowners. Privately-held credits are available for sale unless the account holder has an anticipated need for the credits. *Christian*

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Properties represents one account holder that has officially requested Corps review and approval of its mitigation site for use under the 404 program.

Ventures Capitalized with Public Resources

Three operating credit ventures—Cottonwood Creek (CA), Bracut Marsh (CA), and Astoria Airport (OR)—were developed and capitalized with public resources.

The *Cottonwood Creek* venture, sponsored by the California Department of Fish and Game (CDFG), pursues a break-even financial goal. The venture focuses on wetland creation on lands owned by CDFG in order to provide mitigation for small-scale, isolated wetland impacts that fall outside 404 jurisdiction, as well as for 404 NWP and individual permit impacts of 1-5 acres subject to Corps approval on case-by-case basis. The mitigation work is proceeding in stages and, as of November 1995, mitigation work had been completed on a total of eight acres which were used to provide mitigation for four projects, three of which involved 404 permits.

Two other publicly-capitalized credit ventures—Astoria Airport (OR) and Bracut Marsh (CA)—are among the oldest operating mitigation credit ventures of any type.

Astoria Airport was developed by the Oregon Division of State Lands to provide credits for the Port of Astoria and other general water-dependent projects. The Astoria venture was part of a comprehensive plan for a 16-mile reach of the Columbia River. The Port reserved credits by deeding the land and providing fill material for the project. Approximately 60 of the 70 expected credits remain. The Corps suspended use of the venture for 404 permitting in 1992 due to problems with the venture's replacement wetlands. Restoration of a mostly upland fill site into brackish marsh was not successful. The restoration resulted in freshwater wetlands.

The *Bracut Marsh* venture services permits for "pocket marshes" in the City of Eureka and estuaries in the Humboldt Bay area. The venture was developed by the California Coastal Conservancy. The Corps was not a signatory to the operating agreement for the Bracut venture, and did not, at the time, claim jurisdiction of the specific wetlands for which the venture was developed to provide compensatory mitigation.¹³ The Conservancy and State Coastal Commission conceived the venture as a fully reimbursable effort with Conservancy expenditures reimbursed on a pro-rata basis by mitigation fees. However, only construction and management costs were included in the computation of mitigation fees. As of 1992, only 54% reimbursement of expenditures were expected. Further, several remedial actions have been necessary, owing to inadequate hydrology and substrate problems.

Ventures Capitalized Exclusively with Mitigation Fee Revenues

The IWR survey identified three ventures that provide compensatory mitigation for 404 permit impacts which are capitalized exclusively with mitigation fee revenues. These include the Maryland Nontidal Wetlands Compensation Fund, Pine Flatwood (LA), and the Virginia Restoration Trust.

The *Maryland Nontidal Wetlands Compensation Fund* is a state-run program developed pursuant to the Maryland Nontidal Wetlands Protection Act which collects mitigation fees for small-scale impacts permitted under the state regulatory program, as well as for certain 404 permit impacts which the state oversees through General

¹³ Case studies of these two ventures are presented in: Environmental Law Institute and Institute for Water Resources. 1994. *Wetland Mitigation Banking: Resource Document*. U.S. Army Corps of Engineers, Institute for Water Resources. IWR Report 94-WMB-2. (January).

Programmatic Permit authority. The general permit serves as the operating agreement between the state and the Corps for fee-based compensation. For impacts to nontidal wetlands involving less than five acres, the Corps Baltimore District may authorize activities under the general permit, while projects over five acres require both state and 404 permits. The venture has been collecting mitigation fees since 1991 which are used by the state regulatory agency for the purchase, restoration, and management of nontidal wetlands throughout the state. As of mid-1994, a total of eight sites had been purchased and restored through the venture, and six other restoration sites were under construction or in planning.

The Pine Flatwood and Virginia Restoration Trust ventures were both established by MOAs between the Corps and The Nature Conservancy (TNC). Under these ventures, Corps-approved permittees pay mitigation fees to the TNC which are held in trust for the eventual purchase of privately-owned wetlands, and their subsequent preservation or restoration and long-term management.

Pine Flatwood has been operational since 1992. It provides the fee option for 404 individual permit impacts involving Longleaf Pine Flatwood wetlands in Southeastern Louisiana, and applies fee revenues for the purchase and active management of these wetlands. As of November 1995, one large site had been purchased and was being actively managed by TNC, and acquisition of a second site was being pursued.

The *Virginia Restoration Trust*, which began operating in 1995, provides the fee option to Corps-approved applicants for Nationwide permits. Mitigation fees are held in trust by TNC for the purchase and preservation or restoration of critical wetlands and riparian habitats. A stated goal of the venture is to secure a minimum ratio of 2:1 (acres) of wetlands restored or created, or a minimum ratio of 10:1 (acres) of wetlands preserved for each wetland acre of Nationwide permit impact. This

will be accomplished by pooling funds so as to maximize size of sites purchased for restoration, creation, enhancement or preservation. Site suitability, maximum return on expended funds, wetland functions, and an acceptable restoration plan will be considered before approving sites for purchase. Fees are based on the market prices per acre of wetland mitigation (i.e., land purchase cost plus restoration, etc., cost) in the vicinity of the impacts. As of November 1995, the venture had collected fees from four permittees and TNC had developed a proposal for the purchase of a wetland preservation site.¹⁴

A number of other fee-type mitigation systems are in operation around the country that were not identified by the IWR survey, probably because they largely reflect ad-hoc operations that focus on the provision of project-specific, off-site mitigation. For example, the Corps Little Rock and Vicksburg Districts have allowed certain applicants for 404 general or individual permits, on a case-by-case basis, to pay The Nature Conservancy or other conservation entities to fulfill their project-specific mitigation requirements at an off-site location when on-site mitigation was deemed infeasible or environmentally undesirable.¹⁵

¹⁴As of August 1996, the Fund had collected fees from 11 NWP actions. TNC has used some of the funds to purchase 160 acres of valuable wetlands with upland inclusions on the Northwest River in Chesapeake, Virginia.

¹⁵The use of fee-based compensation in these two Corps Districts is discussed in: Apogee Research, Inc. 1993. *Alternative Mechanisms for Compensatory Mitigation: Case Studies and Lessons about Fee-Based Compensatory Wetlands Mitigation*. Working paper prepared for the U.S. Army Corps of Engineers, Institute for Water Resources.

Ventures Capitalized with a Combination of Capital Sources

The IWR survey identified nine operating credit ventures which are capitalized using a combination of capital sources, two of which—Wikiup (CA) and Vandross Bay (SC)—pursue a maximize-return financial goal. These two ventures are sponsored by private sector firms which use lands they own for the mitigation siting. Each was allowed to sell a limited portion of site credit capacity prior to the construction of replacement wetlands, but were not required to post financial assurances. These ventures are classified as being capitalized with a combination of capital sources because they rely at least in part on credit sales revenue to finance mitigation work, but were not required to commit up-front private (public) capital in the form of financial assurances in return for the right to engage in early credit sales

As of September 1995, the *Wikiup* mitigation site was under construction and, under the terms of its operating agreement (MOA finalized in 1995), the venture was allowed to sell some portion of site credits for 404 impacts, although no debiting had occurred as of that date. The *Vandross Bay* venture focuses on producing mitigation for 404 permitted impacts involving isolated and Carolina Bay type wetlands. As of November 1995, Vandross had sold 30 to 40 credits and site construction was complete.

Two of the surveyed ventures capitalized with a combination of capital sources—Delta Land Trust (MS, LA) and Wadsworth (IL)—have a cost-plus financial objective. *Delta Land Trust*, which received its operating permit in 1994, is a credit supply program sponsored by the Delta Land Trust, a non-profit organization dedicated to reforestation of bottomland hardwood wetlands in the Mississippi Delta region. Delta operates the program by securing conservation easements on privately-owned, prior-converted and farmed wetlands (individual sites must be a minimum of

100 acres), which are then restored by Delta in order to produce commercial mitigation credits. Delta's permit allows for the sale of a limited portion of credit capacity from any one site prior to the construction of replacement wetlands for 404 permit impacts involving forested wetland communities. Delta indicates that it will price credits somewhat above production costs in order to generate revenue for its various conservation efforts in the region. As of November 1995, Delta had not activated the program for reasons which are reviewed in Chapter 3.

Wadsworth is sponsored by Wetland Research, Inc., a non-profit organization that focuses on wetland restoration and creation in the Midwest. The *Wadsworth* venture, which received its operating permit in 1995, was developed pursuant to the area-wide guidance for commercial credit trading developed for the Corps Chicago District. *Wadsworth* focuses on the creation and enhancement of wetlands on land owned by the Lake County Forest Preserve. Under the Chicago District guidance, the venture was allowed to sell a limited portion of credit capacity for primarily NWP impacts prior to site construction. As of November 1995, site construction was still in progress.

The final five operating ventures which are capitalized with a combination of capital sources each have a break-even financial objective. These include ventures sponsored by DuPage County (IL), Dade County (FL), and West Eugene (OR) which were developed as part of watershed planning mechanisms implemented in these localities to reconcile wetland management and development goals. The watershed management plans each include some type of wetland categorization which defines the regulatory treatment to be given to different wetland areas, and each rely on credit trading in part to drive watershed restoration activities. Each of these management plans include the issuance of General Programmatic Permit authority to the locality or

some other alternative 404 permitting arrangement to facilitate implementation.¹⁶

The *DuPage County* venture (Cricket Creek), which received its Department of the Army permit in 1994, was developed to conform with the area-wide rules for commercial credit trading established by the Corps Chicago District. It relies on mitigation fees charged for permits issued by the county under 404 General Programmatic Permit authority received in 1995, and uses land owned by the DuPage County Forest Preserve District for wetland creation and enhancement. The venture has sold 10-20% of credit capacity, and site construction is underway.

The *Dade County* venture uses mitigation fees charged for 404 permits for the restoration of wetlands on public lands as part of the county watershed management plan. Under the plan, tree island wetlands are specified as off-limits to development, while other wetlands can be developed in return for a mitigation fee paid to the county for ongoing restoration projects in the Everglades National Park and other wetland sites in Dade County.

The *West Eugene* venture is a city-run mitigation credit system that is part of the city watershed management plan authorized by the Corps and the Oregon Division of State Lands in 1995. To help implement the plan, the Corps established an alternative 404 permitting procedure whereby it will issue "letters of permission" rather than individual permits for projects that have been approved by the city under the plan. Approved wetland development projects will be required to purchase mitigation credits from the credit system. Three types of credits are recognized: (1) banked credits, (2) concurrent credits, and (3) post credits. Banked credits are based on mitigation work already undertaken using public funds. Concurrent

credits will be associated with a mitigation fee that will be used to produce replacement wetlands concurrently with the permitted wetland impact, while post credits will be associated with fees that will be held in trust for the future production of replacement wetlands. The West Eugene mitigation work will proceed on lands which were purchased using Federal Land and Water Conservation Funds channeled through the Bureau of Land Management.

In 1993, West Eugene implemented a small restoration test site which relied on revenues from mitigation fees charged for permitted impacts under the state regulatory program to restore wetlands on lands owned by the Bureau of Land Management. As of November 1995, no other mitigation work had been implemented under the plan, and the Corps had not yet received a request by the city to activate the alternative permitting procedure for 404 permits requiring compensatory mitigation.

The final two ventures—the Ohio Wetlands Foundation (OWF) and Cypress Island (LA)—are sponsored by non-profit entities. The *Ohio Wetlands Foundation* (OWF) was established as a non-profit entity by the Ohio Homebuilders Association to produce readily available wetlands mitigation. OWF relies on fees charged for Nationwide permits, as authorized by the Corps on case-by-case basis, to fund the production of replacement wetlands on state-owned lands. The venture has been operating since 1992 and has completed mitigation work at two sites.

The *Cypress Island* venture is sponsored by the Louisiana Chapter of The Nature Conservancy (TNC). It relies on a prior-converted, bottomland hardwood site owned by TNC for the production of replacement wetlands. In 1994, TNC proposed use of the site for providing mitigation for 404 individual permits involving impacts to forested wetlands, and the Corps subsequently allowed 20 to 25 permittees to satisfy their mitigation

¹⁶ See: White and Shabman, note 4.

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requirements through payment of a fee to TNC. The mitigation fees are being held in trust by TNC and will be used to implement restoration of the site in early 1996.



CHAPTER THREE. CASE STUDIES OF SELECTED OPERATING CREDIT VENTURES

This section provides case studies for several of the operating commercial credit ventures identified by the IWR survey. Specifically, case studies are provided for six ventures that are representative of different venture types defined by the Table 1 taxonomy. The ventures chosen for case study analysis illustrate a wide range of institutional forms and operating characteristics. They include: St. Charles (IL), Cottonwood Creek (CA), Pine Flatwood (LA), Vandross Bay (SC), Delta Land Trust (MS, LA), and Ohio Wetlands Foundation.

The case studies provide summary information on the following venture characteristics: location, credit producer, operating agreement, landowner, mitigation plan, market, service area, credit evaluation and trading, credit price, success criteria, monitoring and maintenance, long-term protection and management, timing of credit sales, financial assurance/contingency plans, and current status. Unless otherwise indicated, current status and other information are as of November 1995.

Case Study 1: Venture Capitalized with Private Resources; Maximize-Return Financial Objective—*St. Charles*

Location: St. Charles Township in Kane County, Illinois

Credit Producer: Land and Water Resources, Inc (LWR).

Operating Agreement: CWA Section 404 individual permit issued in June 1994. The permit specifies that the bank should be operated in conformance with the *Agreement to Establish Wetlands Mitigation Bank* as executed by the St. Charles Park District and LWR (signed December 20, 1993). The permit also incorporates the rules and standards set forth in the *Interagency Coordination Agreement on Mitigation Banking within the Regulatory Boundaries of Chicago District, Corps of Engineers (ICA)*, signed in March 1994 by the Corps, USFWS, and USEPA.

Landowner: The St. Charles Park District. LWR paid the Park District for use of the land with a one-time lease payment (\$64,410), plus a profit-sharing arrangement whereby the Park District would receive a percentage of credit sales revenue exceeding a certain cost basis.

Mitigation Plan: The mitigation plan focuses on the restoration of hydrology and native communities on 36.1 acres of wetlands (riparian, emergent, wet prairie, and mesic prairie wetlands) and 11.9 acres of upland mesic prairie buffer through the removal of drainage tiles, partial excavation to create a variety of community habitats, and planting of wetland vegetation.

*Case Studies of Selected
Operating Credit Ventures*

Market: While the venture permit does not place any limitations on the types of permit impacts that can be served, the venture is subject to the ICA, which says:

It is intended that mitigation banks...be used primarily to mitigate wetland impacts associated with projects which, individually, affect relatively small acreage of low value wetlands...Typically, these will be projects which, with mitigation, are currently authorized under Nationwide Permit No. 26.

Service Area: The ICA divides the Chicago District into five regional watershed areas. Ventures are limited to serving permit impacts which occur in the watershed area in which they are located (exceptions are allowed in certain cases, but such outside watershed trades are subject to higher trading ratios). St. Charles is located in the Fox River watershed, which includes parts of Kane, McHenry, Lake, Cook, Will and DuPage counties in Northeastern Illinois. The Fox River watershed within the Chicago Corps District is approximately 300 square miles.

Credit Evaluation and Trading: Credits are defined in terms of acres of wetland class. The Corps determined that the mitigation plan would produce a total of 46.17 acres of credits, based on full credit for wetland acres restored and partial credit for upland buffers. The ICA defines three types of credits: (1) uncertified—available for sale prior to construction of replacement wetlands, (2) conditionally certified—after the second growing season following construction if trending toward success, and (3) certified—replacement wetlands have met all success criteria. Trading ratios are 1:1 for certified credits, and 1.5:1 for uncertified or conditionally certified credits. For allowable trades outside watershed service area, trading ratios are increased by a factor of 2.

Credit Price: Credit prices per acre have been in the \$40-45,000 range.

Success Criteria: The venture is subject to the following performance standards mandated by the ICA: (1) Federal wetland delineation criteria met; (2) native perennial species of wetland plant community represent 50% of species within two years of planting, and 80% within five years; (3) at least 75% of total plant cover is obligate facultative wetland species; and, (4) at least 70% of species planted or seeded are alive.

Monitoring and Maintenance: The permit requires monitoring and maintenance of the site for five years following construction according to the specifications included in: (1) *Hydrological Monitoring Plan* developed by Christopher S. Burke Engineering Ltd. and (2) *St. Charles Wetland Bank Prairie and Wetland Planting Plan* developed by Applied Ecological Services, Inc. (Brodhead, Wisconsin). The venture established an irrevocable letter of credit, which names the Park District as the beneficiary, to fund monitoring and maintenance activities during the liability period. The funding level was determined by the bank sponsor and the Park District, based on Park District experience in managing several natural areas.

Long-Term Protection and Management: The site is protected under a perpetual conservation easement issued in 1994 by the Park District which pertains to all wetland and upland areas of the venture site. The conservation easement names the Park District as the entity responsible for long-term management of the site. The Park District used its share of the credit sales revenue to establish an endowment to fund long-term management.

Timing of Credit Sales: Upon approval of the venture's permit, uncertified credits (no more than 30% of the venture's credit capacity) are released for sale. An additional 20% of credit capacity can be sold when wetlands hydrology has been demonstrated (through monitoring on-site water table relationships), and another 20% when planting is complete. The final 30% of credit capacity is available for sale upon certification of credits (all success criteria are met).

Financial Assurance/Contingency Plans: The ICA requires that sales of uncertified credits must be backed with surety bonds or their equivalent equal to the estimated cost of generating conditionally certified credits. Once achieved, assurance amounts can be reduced to the cost of generating certified credits. The venture posted separate surety performance bonds for construction (earthmoving and placement of water control structures) and planting equal to the estimated cost of these activities. The construction bond (approximately \$7,000 per acre) is releasable following construction. One-half of the planting bond (approximately \$2,000 per acre) is releasable at the conclusion of planting; the other half cannot be released until success criteria are achieved. The surety bonds name the St. Charles Park District as the beneficiary. The venture sponsor was able to get a surety performance bond because it was a construction company with a long record of using bonds in its practices; no collateral was required. Details of the bonds are found in the agreement between the Park District and the bank sponsor, which is also referenced in the surety bond for the construction phase.

Current Status: The entire venture site was constructed and planted immediately following permit issuance in June 1994. Corps representatives report that hydrology has been restored and planted vegetation is progressing toward achievement of success criteria. As of November 1995 (after two growing seasons), the venture was allowed to sell up to 70% of credit capacity (i.e., all venture credits have been conditionally certified), but had sold somewhat less than this amount. [As of August 1996, all available credits (70% of capacity) had been sold. The venture sponsor had also started earth moving on a second bank (84 acres) on an adjoining tributary and connected by publicly-owned wetlands.]

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**Case Study 2: Venture Capitalized with Public Resources;
Break-Even Financial Objective—*Cottonwood Creek***

Location: Near the city of Cottonwood, in a corridor between the confluence of Cottonwood Creek and the Sacramento River, in Shasta County, California.

Credit Producer: California Department of Fish & Game (CDFG).

Operating Agreement: CWA Section 404 Nationwide Permit No. 26 issued in January 7, 1994. The permit incorporates the requirements and responsibilities set forth in the *Cottonwood Creek Mitigation Bank Plan*, dated April 28, 1994, as approved by the Corps, USEPA, USFWS, and the UCSCS (now NRCS).

Landowner: CDFG.

Mitigation Plan: The undeveloped mitigation site encompasses approximately 90 acres of pasture land adjoining Cottonwood Creek, which includes uplands and some jurisdictional wetlands (less than 10% of the site). The mitigation plan focuses on the creation of over 40 acres of permanent wetlands (6.5 acres of sloughs and ponds), semi-permanent wetlands (22.1 acres of freshwater emergent marsh and wet meadows), seasonal wetlands (8.8 acres of moist soil vegetated habitat), and riparian wetlands (2.8 acres along sloughs and water delivery ditches). Wetland creation involves the construction of required topography and impoundments, and planting of target species vegetation for each habitat type. The mitigation plan envisions that created wetlands will only require annual rainfall to stay viable. However, to account for the possibility that annual rainfall would not provide sufficient water to the site, and to maximize functional periods and habitat values, the CDFG has entered into a contractual agreement with the Anderson-Cottonwood Irrigation District (ACID) to provide a supplemental water supply to the site through an existing water delivery system to and on the site which is operated and maintained by ACID. This supplemental water source will be utilized as needed.

Market: The operational plan states that: "Use of the mitigation bank to offset wetland values and function is limited to impacted wetlands that are isolated and less than acre (or up to five acres with the Corps approval)." The venture market thus includes Nationwide Permit No. 26 (NWP 26) impacts less than one acre (for which the Corps does not require mitigation, but for which mitigation is often required under local land use permit programs), as well as NWP 26 and 404 individual permit impacts involving 1 to 5 acres. The Corps has final decision-making authority only for proposed trades involving individual permit impacts and NWP 26 impacts greater than one acre.

Service Area: Includes permitted wetland impacts that occur in the Northern Sacramento Valley floor in Shasta or Tehama County, as long as CDFG has determined that "...a lesser distance is not needed to assure effective compensation for affected species." The service area is approximately 1700 square miles.

Credit Evaluation and Trading: Credits are based on acres of wetland type. Only in-kind trades are allowed, unless there is no other viable mitigation option available and such out-of-kind trades are necessary to ensure no net loss of wetland acreage. The operational plan states that the following acreage trading ratios will apply:

(a) 2:1 for emergent freshwater marsh, (b) 2:1 for wet meadows, and (c) 3:1 for riparian wetlands. If permitted wetland impacts occur in conjunction with impacts to climax riparian woodland and/or deepwater habitat, trading ratios will be determined by the lead regulatory agency on a case-by-case basis and may exceed 3:1. The operational plan also allows for trading ratios to be reduced (but in no case below 1:1) in cases in which the permittee agrees to perform all or part of the mitigation work on the venture site required to compensate for its project impacts.

Credit Price: The purchase price of mitigation credits are to be at least sufficient to offset all costs associated with bank establishment and perpetual operation and maintenance, and should include an amount to allow for remedial measures. These costs are determined using the following factors: fair-market value (prior to conversion to wetland habitat) or current value; site acquisition transaction costs; planning; engineering design; administration, operation, and maintenance costs; taxes, insurance, water supplies, equipment, and personnel; all costs associated to reflect inflation and bank evaluations and monitoring; and any other costs relevant to preserving wetlands in perpetuity. CDFG estimated these costs at \$25,609 per acre. Fees collected are used to fund several long-term endowments. The CDFG can also collect fees from developers for unexpected bank creation costs.

Success Criteria: The operational plan states that: "Project wetlands will be deemed to have been successfully established when a minimum of 60 percent of the hydric vegetation (as measured by relative cover) is composed of target genera for each wetland habitat type....During the first three years, a minimum of 20 percent composition of target genera per year will be the goal."

Monitoring and Maintenance: CDFG is responsible for annual monitoring of the site following construction for a period of five years. Specific remedial measures are required when monitoring finds that staged success criteria have not been met in years 1 to 4 following construction. These remedial actions include replanting, changes in water delivery and water manipulation, and soil amendments.

Long-Term Protection and Management: Once all available venture credits have been sold, CDFG will be responsible for maintaining the site as wetlands in perpetuity. The operational plan requires CDFG to develop a closure plan that will be subject to approval by the Corps. The plan also requires CDFG to deposit a portion of credit sales revenue into a special interest-bearing endowment account, with the interest to be used for funding long-term management of the site. Using its prior experience with wetland creation projects (and a 24% overhead factor), CDFG estimated the funds per acre (\$1488) to be deposited into the long-term management interest-bearing endowment account. Long-term interest-bearing endowments are also set up for: emergency-water irrigation; in-lieu taxes; mosquito abatement; and, operation and maintenance (a quarter time Fish and Wildlife assistant).

Timing of Credit Sales: The operational plan allows for the sale of credits immediately following construction and evaluation of mitigation work. It states:

...distribution of bank credits at this wetland mitigation bank site which will create new wetland and riparian habitat but which have not yet reached a mature climax successional stage will be permitted if the bank site has been established and the Department continues to achieve the performance of objectives specified in the development plan.

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Financial Assurance/Contingency Plans: No financial assurance is required as a pre-condition for credit sales. The operational plan does provide that if the performance objectives of the design plan have not been met or the conditions of the bank site change which alter the further development of the design plan, sale of credits shall be suspended until a Corps-approved remediation plan is successfully implemented. It also includes the following language: "If fourth year monitoring reveals that all goals have not been met, then another site will be developed to substitute for the failed site."

Current Status: Wetland creation (grading, construction of impoundment, planting) proceeded on a total of eight acres during the summer and fall of 1995. Due to less than normal rainfall during this period, the eight acres of mitigation have not achieved desired saturation. Delivery of the supplemental water source was scheduled to begin sometime in December 1995 to remedy this situation. The credits produced by this first stage of site construction were sold to four different permittees. Three of the four sales were for 404 NWP 26 permits, and thus required prior approval by Corps. The other credit sale was for permitted impacts to riparian habitat involving less than one acre.

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Case Study 3: Venture Capitalized Exclusively with Mitigation Fee Revenues; Break-Even Financial Objective—*Pine Flatwood*

Location: Lake Ramsey (near Covington) and other prospective sites in St. Tammany Parish, Louisiana.

Credit Producer: The Nature Conservancy (TNC), Louisiana Chapter.

Operating Agreement: MOA between the Corps, USEPA, USFWS, Louisiana Department of Natural Resources, Louisiana Department of Wildlife and Fisheries, and TNC signed in January 1992.

Landowner: Mitigation sites are purchased and held for conservation purposes by TNC.

Mitigation Plan: The venture focuses on the acquisition, preservation, and active maintenance of pine flatwood wetlands (closed pine flatwoods, pine flatwood savannahs, bayhead swamps, and slash pine-cypress and hardwood forests) in Southeastern Louisiana. Because these wetlands are impossible to replace, can only survive in large tracts, and require active fire and hydrology management to stay viable, the Corps has allowed permittees to pay a mitigation fee in lieu of the direct provision of mitigation for unavoidable impacts to these wetlands. Once the Corps determines a permittee's mitigation requirement in acres, TNC determines the

appropriate mitigation fee. Fees are paid directly to TNC and held in trust for the eventual purchase, preservation, and active maintenance of pine flatwood wetlands.

Market: CWA Section 404 and state permits involving unavoidable impacts to pine flatwood wetlands.

Service Area: Permit impacts in Southeastern Louisiana parishes that lie east of the Mississippi River and north of Lake Ponchartrain. This area is approximately 4,000 square miles in size.

Credit Evaluation and Trading: The MOA stipulates that: "In all cases, mitigation should provide, at a minimum, one for one functional replacement (no net loss of ecological value), with an adequate margin of safety to reflect the expected degree of success associated with the mitigation plan." Initially, the Corps used a 1:1 replacement ratio defined in acres. Now, the Corps uses functional assessment methods to assess impacts and determine mitigation requirements that ensure functional equivalency. Both the "Habitat Evaluation Procedure" and an "Ecological Value Assessment" (which uses numeric criteria to consider landscape position, hydrologic integrity, unnatural disturbances and other factors) are used to assess the quality of impacted and replacement wetlands. Trades based on functional equivalency are then translated into areal mitigation requirements.

Credit Price: Costs included in calculation of compensatory mitigation fees are: planning; land acquisition; project implementation; and site management. As of 1993, the fee per mitigated acre was about \$1700.

Success Criteria: The MOA includes standards for site selection, but does not include specific success criteria for replacement wetlands because pine flatwood wetlands are not well-understood, and no clear and objective basis for measuring success exists.

Monitoring and Maintenance: The mitigation sites are managed according to best management practices for pine flatwood wetlands, which include, at a minimum, "judicious use of prescribed fire in fire-dependent systems, control of shallow-water hydrology on-site and immediately surrounding the bank site, and restriction of unnatural disturbances." Mitigation sites will be actively managed for a period of 50 years, and monitored approximately every five years by an interagency team to determine if replacement wetland values are increasing as expected.

Long-Term Protection and Management: After the 50-year management period has ended, TNC will retain ownership of mitigation sites and continue management, or will transfer sites to a private conservation entity or government agency that will assume management responsibilities.

Timing of Credit Sales: Mitigation fees are charged prior to the provision of replacement wetlands. Fees are accumulated in trust by TNC and, when sufficient, are used to purchase, preserve, and manage large tracts of replacement wetlands.

Financial Assurance/Contingency Plans: Financial assurance is not required. The MOA states that:

...in the event that TNC for any reason becomes unable to operate the mitigation bank, operation of the bank may be transferred to a private conservation entity or governmental

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agency as agreed to by all signatories to the Agreement. If operation of the bank is transferred, title to all mitigation areas and all remaining management and administrative funds in the bank will be transferred to the new bank operator, subject to perpetual covenants and easement that guarantee operation of the bank....

Current Status: The first and presently the only mitigation site (Lake Ramsey) was purchased about one year after the first mitigation fees were collected. TNC has made a number of unsuccessful attempts to purchase additional sites, and, as of November 1995, were hoping to soon finalize purchase of a second tract. At that time the trust contained over \$500 thousand in mitigation fee revenues.

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**Case Study 4: Venture Capitalized with a Combination of Capital Sources;
Maximize-Return Financial Objective—Vandross Bay**

Location: Vandross Bay, northwest of Yauhannah, in Georgetown County, South Carolina.

Credit Producer: The Combahee Land Company, Charleston, South Carolina.

Operating Agreement: CWA Section 404 individual permit issued in October 1994. Incorporates the stipulations, requirements, and commitments contained in the final *Vandross Bay Mitigation Bank Plan* as last revised in August 1994.

Landowner: The Combahee Land Company (CLC).

Mitigation Plan: The venture mitigation site includes 804 acres, of which 142 acres are uplands and 662 acres are jurisdictional wetlands. The wetlands include 658 acres of Carolina Bay Complex (CBC) wetlands (of which 31 acres have been impacted by silviculture and dominated by planted loblolly pines), and four acres of isolated depressional wetlands and hardwood drains. The mitigation plan involves restoration and enhancement of jurisdictional wetlands, and preservation and management of upland buffers. Wetland enhancement involves the restoration of a natural hydrology regime through the use of earthen plugs placed in drainage ditches (to block the flow of water that would otherwise be drained from the site), and restoration of vegetative communities in the 31 acres of pine plantation in the CBC by selective timber cutting, leaving the indigenous wetland species intact.

Market: Unavoidable CWA Section 404 permit impacts to isolated wetlands and Carolina Bay type wetlands.

Service Area: The venture can serve permit impacts involving isolated wetlands that occur within the coastal plain of South Carolina, which is defined to include 17 counties, approximately 14,000 square miles. It can also serve permit impacts involving Carolina Bay wetlands that occur anywhere in the state.

Credit Evaluation and Trading: Credit capacity was determined using an assessment methodology (SOP-93-02) utilized by the Corps Charleston District Regulatory Branch for evaluating mitigation. Using this methodology, the Corps determined that the mitigation plan would produce 723.8 credits. Credit requirements for individual trades are determined by the Corps on a case-by-case basis. The Combahee Land Company provides data sheets for each credit/debit transaction to the Corps, the South Carolina Department of Health and Environmental Control and/or South Carolina Coastal Council. Annual summary of bank transactions are provided to each party.

Credit Price: Credits have sold for approximately \$1,800 each.

Success Criteria: The restoration effort will be deemed successful and complete if, at the end of the six year monitoring program, the restoration area is vegetatively dominated by wetland plant species indigenous to the CBC. Also, the occurrence of loblolly pine within the restoration area may not exceed the percentage naturally occurring within the bay as a whole. Restoration of hydrology within the CBC will be considered successful and complete when earthen plugs have been installed and the hydrology stabilized for a period of five years without maintenance.

Monitoring and Maintenance: Monitoring is required to document the regeneration of volunteer vegetative species within the 31-acre pine plantation restoration site to ensure establishment of a hydrophytic community similar to the adjacent CBC. Initial monitoring occurs at the end of the first growing season following harvesting, and annually thereafter for 5 consecutive years. Monitoring will also document the regeneration of planted loblolly pine, and remediation involving the removal of loblolly pine seedlings, if necessary, will be done after the second and sixth year monitoring periods. The operating agreement says that: "Mitigation will be deemed successful, and vegetative monitoring will no longer be required, upon achievement of success criteria...." Installation and maintenance of earthen plugs is also the responsibility of CLC, and this obligation will continue until the plugs have stabilized for a period of five years without maintenance, or for as long as credits are being withdrawn, whichever is longer.

Long-Term Protection and Management: Long-term management of the site is the responsibility of CLC and is guaranteed by a conservation easement held by The Nature Conservancy. Under the conservation easement, CLC retains hunting rights, and will manage the site to promote wildlife habitat goals and associated recreational uses according to a regulator-approved management plan. The easement also stipulates that CLC will provide The Nature Conservancy with 10% of the credit sales revenues to cover the cost of enforcing this and other conservation easements.

Timing of Credit Sales: Twenty percent of credit capacity (or 144.76 credits) was made available for sale when the venture 404 permit was granted and the conservation easement executed with The Nature

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Conservancy. The remaining 80% of credit capacity is releasable for sale following the implementation of the restoration plan.

Financial Assurance/Contingency Plans: Financial assurance is not required. The venture operating agreement states:

If, at the end of the monitoring program, success criteria have not been met, CLC will consult with The Nature Conservancy, Corps, and other appropriate state and federal regulatory agencies to determine specifically what remedial action should be taken. If significant problems with restoration efforts are identified prior to the end of the monitoring program, regulatory agency personnel will be consulted regarding the advisability of taking remedial actions at that time. Remedial action may include planting, removal of non-native vegetation, grading, modification of hydrology and continued monitoring.

Current Status: Site construction was undertaken in 1994-1995. Natural hydrology has been re-established and the regeneration of volunteer vegetative species within the pine plantation restoration site is progressing. As of November 1995, approximately 30 to 40 venture credits had been sold. Regulators believe that the success of this bank to date owes to the fact that resource agencies had previously indicated that they were interested in protecting this property. There appears to be no divergent view as to the status (success) of this bank. [As of 1 August 1996, 100 venture credits had been sold.]

Other: Bank siting involved several stages and prospective sponsors. The Nature Conservancy identified the site as a higher quality CBC wetlands. Although the degraded site did not meet their requirements, the TNC thought it might be a good bank site. Subsequently, the South Carolina Highway Department attempted to purchase the site for use as a bank, but their negotiations were unsuccessful. The CLC then obtained an option to purchase the land and established a conservation easement with the TNC.

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Case Study 5: Venture Capitalized with a Combination of Capital Sources; Cost-Plus Financial Objective—*Delta Land Trust*

Location: Various prospective sites in Louisiana and Mississippi within the regulatory jurisdiction of the Corps Vicksburg District.

Credit Producer: Delta Land Trust (Delta), a non-profit entity that focuses on the reforestation and conservation of bottomland hardwood wetlands in the Mississippi Delta region.

Operating Agreement: CWA Section 404 general permit issued in October 1994 which incorporates the *Delta Mitigation Banking Program Agreement* signed by the Corps, USEPA, USFWS, Louisiana and Mississippi state regulatory and resource agencies, and Delta Land Trust.

Landowner: This venture is a mitigation program which can include multiple mitigation sites on privately-owned, prior-converted and farmed wetlands. Venture mitigation sites remain in private ownership but are subject to perpetual conservation easements held by Delta Land Trust. The Corps has third party enforcement rights on this easement.

Mitigation Plan: The mitigation program is for the restoration of prior-converted croplands and enhancement of farmed wetlands to establish forested wetland communities on different mitigation sites, each of which must be at least 100 acres. The proposed restoration plan for each venture site is furnished by Delta to the Corps for review and approval; implementation of approved restoration plans is the responsibility of Delta. The operating agreement states: "Delta shall complete tree planting on the entire mitigation bank tract during the first planting season following initial withdrawal of credits, unless planting is made technically infeasible by events such as flooding. If this occurs, planting will proceed as soon as practicable following such circumstances." All hydrological modifications, which may include removal of levees or dikes, plugging of drainage ways and breaking tile drains, must be completed no later than the fifth year following initial planting.

Market: Delta sites are limited to serving unavoidable CWA Section 404 and state permit impacts involving forested wetland communities.

Service Area: The operating agreement states that the venture is meant to

...compensate for unavoidable wetland impacts within the same watershed where appropriate and practicable. If replacement of functions and values is not practicable within the same watershed, the Vicksburg District may, if appropriate, allow mitigation outside of the watershed within its jurisdictional boundaries, preferably within an adjacent watershed similar to the areas where the losses occurred. In all cases mitigation will be performed in the state where losses occur.

Credit Evaluation and Trading: Delta Land Trust will provide in-kind replacement of forested wetlands only. Replacement (and impacted) wetlands will be subject to functional evaluation using the "Habitat

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Evaluation Procedure" (HEP). Number of acres restored at a mitigation site multiplied by the net gain in habitat resulting from restoration (as measured in "average annual habitat units" which considers changes in habitat quantity and quality over time) will determine total available site credits. The Corps will determine the number of credits required for trades on case-by-case basis, but in all cases a minimum compensation of 1:1 defined in terms of acres will apply.

Success Criteria: Success criteria specific to each mitigation site will be set out in the approved restoration plan for each site. Restoration plans will require planting of at least 180 trees per acre, with a minimum of 125 trees per acre (including trees of the target species resulting from natural regeneration) surviving at year three and year five. Replanting may occur during year three and year five to achieve these standards. Hydrology must be re-established within two years of successful establishment of vegetation.

Monitoring and Maintenance: Delta Land Trust is responsible for monitoring and maintaining mitigation sites in perpetuity. Monitoring visits will occur annually to ensure compliance with the terms of conservation easements, restoration and management plans, and annual monitoring reports will be furnished to the Corps. If monitoring uncovers failure to meet success criteria or non-compliance with permit conditions, Delta must ensure that corrective actions, such as replanting and repair or replacement of water control structures, are undertaken.

Long-Term Protection and Management: Landowner participation in the venture requires donation of farmed wetlands and/or prior-converted wetlands to Delta via a conservation easement. The easement requires landowners to permanently and perpetually remove lands from farming and other development uses in order to return lands to forested wetlands. Landowners retain the right to engage in property uses that do not conflict with conservation uses, which include commercial fishing and hunting operations, and commercial timber harvesting subject to specific conditions. Delta Land Trust is responsible for enforcing the terms of the conservation easements.

Timing of Credit Sales: Some portion of site credit capacity is available for sale prior to site construction. Up to 50% of site credit capacity can be sold within the three year period following initial planting. At year three, the remaining 50% of credits can be released for sale if the Corps determines that success criteria relating to vegetation and hydrology have been achieved. If success criteria have not been achieved by year three, Delta must effect corrective actions, and replacement wetlands will be reassessed by the Corps in year five. If success criteria have been met by year five, the remaining credit capacity will be made available for sale.

Financial Assurance/Contingency Plans: Financial assurance is not required. Delta Land Trust is responsible for undertaking corrective actions, such as replanting and repair or replacement of water control structures, in the event of failure of mitigation sites to meet success criteria within the liability period. Delta is also responsible for ensuring compliance with all permit and conservation easement conditions. The operating agreement states: "The Vicksburg District may temporarily suspend the availability of credits or suspend the General permit...pending the return of the bank to conditions as specified in the easement and restoration and management plans."

Current Status: As of November 1995, Delta Land Trust had not activated its permit due to the following concerns: (1) the provision which disallows credit sales for 50% of site credit capacity until the third year after

construction—Delta views this provision as creating too much demand-side uncertainty given potential changes to the wetland regulatory program that might occur with CWA re-authorization; (2) the requirement that sites be at least 100 acres in size; (3) prohibition from establishment of mitigation bank sites on publicly owned lands, given the acceptability of this practice as per the Federal Mitigation Bank Guidance (released November 1995); and (4) restrictions on timber harvesting that limit species composition/harvesting flexibility. Delta Land Trust is hopeful that the mitigation bank permits can be modified to reflect these concerns.

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Case Study 6: Venture Capitalized with a Combination of Capital Sources; Break-Even Financial Objective—Ohio Wetlands Foundation

Location: Hebron site in Licking County, Big Island site in Marion County, and other prospective sites throughout Ohio, including the North Ridgeville site in Lorraine County.

Credit Producer: The Ohio Wetlands Foundation (OWF), a private, not-for-profit entity established by the Ohio Home Builders Association to provide compensatory mitigation for 404 permit impacts.

Operating Agreement: *Agreement Between Ohio Department of Natural Resources (DNR), Division of Wildlife, and the Ohio Wetlands Foundation*, dated September 1992. The Corps Huntington District is not a signatory to the agreement, but all credit trades and mitigation activities involving 404 permits are subject to Corps approval and oversight. Once the Corps has given approval for a permit applicant to secure its required mitigation through OWF, the various parties establish a “Wetlands Participation Bank Agreement” which spells out mitigation requirements and responsibilities.

Landowner: Under the agreement between DNR and OWF, only state-owned lands will be used for OWF mitigation activities. The selection of mitigation sites is done jointly by OWF and DNR.

Mitigation Plan: The Hebron mitigation site involved the restoration of prior-converted croplands on a total of 33 acres. The Big Island site involved restoration of prior-converted croplands on 192 acres, and the enhancement of emergent marsh on 100 acres.

Market: The agreement places no restrictions on the types of 404 permit impacts that are eligible to participate in the mitigation program. However, the Corps Huntington District expects that it will only allow the venture to be used to effect mitigation for relatively minor wetland impacts involving 1 to 5 acres. The Hebron site

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was used to provide mitigation solely for Nationwide Permit No. 26 (NWP 26) impacts, while the Big Island site is being used to provide mitigation for individual 404 permit impacts as well as NWP 26 impacts. All proposed uses of OWF by permit applicants are subject to Corps approval on a case-by-case basis.

Service Area: The agreement specifies that mitigation sites will be located in the same geographical regions in which wetland development impacts occur, and that efforts will be made to identify sites in all four quadrants of the state to ensure that mitigation is available for permitted impacts occurring statewide.

Credit Evaluation and Trading: Credits are defined in terms of acres of wetland type, and only in-kind trades are allowed. The Corps determines mitigation requirements on a case-by-case basis, but typically requires at least 1.5 acres of replacement wetlands for every acre of permitted wetland impact.

Credit Price: The first site charge of \$8,000 per acre turned out to be slightly less than actual cost. Their goal was to recover the costs of planning, design, and construction. Land is provided free of charge by DNR. All credit for one site must be sold at the same price. OWF has adjusted credit prices to \$12,000 per acre to incorporate a small surcharge contingency to reflect uncertainty (the goal is break-even).

Success Criteria: After OWF completes the implementation of regulator-approved mitigation work, DNR and the Corps review the site for compliance with the mitigation plan. OWF is responsible for correcting any site deficiencies uncovered at that time, or at any time during the five-year liability period.

Monitoring and Maintenance: Each mitigation site is subject to a five-year audit and monitoring (liability) period which begins immediately following site construction. OWF must monitor the site for problems and submit annual monitoring reports to DNR and the Corps.

Long-Term Protection and Management: Under the terms of the agreement with OWF, the Ohio DNR, Division of Wildlife will retain ownership of sites and is responsible for maintaining them in perpetuity. OWF provides Ohio DNR \$1000 per acre for maintenance.

Timing of Credit Sales: Once a mitigation site has been selected and a mitigation plan approved by DNR and the Corps, OWF may accept compensation fees from Corps-approved permit applicants which are then held in trust. When approximately one-half of the mitigation credits available from a site has been sold, OWF begins mitigation work. Credit sales can thus proceed before, during, as well as after mitigation work has been initiated and completed. For the first site (Hebron site), Ohio Homebuilders Association provided monies to OWF to fund construction prior to the credits sales.

Financial Assurance/Contingency Plans: Under the agreement with DNR, OWF is required to put \$500 into a "failure fund" for each acre of mitigation sold, not to exceed a total of \$25 thousand per mitigation site. OWF maintains and uses the fund to finance any remedial measures required by DNR or the Corps during the five-year liability period. No set conditions stipulate when OWF must tap into the fund for corrective actions.

Current Status: The Hebron site was constructed in the fall 1993 after approximately one-half of site credit capacity was sold. The site was completely sold out for NWP 26 impacts exclusively (33 acres). The Big Island site was constructed in the fall of 1994. About 100 acres of the 292 acre site have been sold or

committed. These sales involved NWP 26 impacts except for the sale of 17 acres to the Ohio Department of Transportation, which involved individual 404 permit impacts. As of November 1995, OWF was in the process of completing the development of mitigation design plans for a third site in the town of North Ridgeville, located in Lorraine County. [In August 1996, the third bank site was approved; the Corps Buffalo District was the signator.]

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CHAPTER FOUR. SUMMARY

- A wide variety of institutional arrangements are being utilized to implement wetland mitigation banking and make the practice available to third party users. Some arrangements can be easily characterized as “mitigation banks,” whereas others are not so easily classified. For the purposes of this study, mitigation banks and related forms are referred to as “mitigation supply ventures.”
- Since the Clinton Administration’s Wetland Plan was introduced in August 1993 (which supported the use of third party banks), the ventures that supply compensatory wetland mitigation to third party permit applicants have increased from approximately a half dozen to two dozen, as of Summer 1995, with many others almost ready for operation.
- Implementation is very spotty in geographic terms. The vast majority of banks are concentrated in the rapidly urbanizing areas of Florida, the southeast and middle Atlantic coast, central and southern California, and northeastern Illinois. Commercial mitigation banking (or similar ventures) has not yet been embraced by sponsors and/or regulators in many regions of the country.
- Bank sponsors indicate that the process to develop bank agreements has been very contentious to date, and, as a result, time consuming. There appears to be a need for:
 - (1) a model banking instrument;
 - (2) bank-related technical information transfer to field offices; and
 - (3) better application of consensus-building mechanisms and tools.
- At this point, only a few regions demonstrate the near-term possibility of having more than one venture in a “watershed” which could offer regulators and permit applicants varying options in terms of third party mitigation supply.
- This report has categorized compensatory mitigation supply ventures based on the source of capital and the financial objectives of the venture.
- This report examines six ventures in detail. The long-term ecological success of the case study ventures cannot yet be forecast due to the recency of their construction (all have been implemented since 1992). They appear to be capable of achieving ecological success. In most cases, the financial success cannot yet be gauged.



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**APPENDIX A.
INVENTORY OF COMMERCIAL
MITIGATION CREDIT SUPPLY VENTURES**

***Appendix A: Inventory of Commercial
Mitigation Credit Supply Ventures***

TABLE A-1. Operating Commercial Wetland Mitigation Ventures, Summer 1995

Bank Ventures	Location (city/county/state)	Banking instruments and Permits*		Source of Capital (Private, public, mitigation fees, combination)	Financial Objective (Maximize, break-even, subsidized)
		Type	Date		
North Atlantic Division					
Neabsco Wetland Bank	Neabsco Creek, Prince William Co., VA	MOA	13 Dec 94	Private	Maximize
White Cedar L. L. C.	Chesapeake (Great Dismal Swamp), VA	MOA	12 Jan 95	Private	Maximize
Virginia Wetlands Restoration Trust Fund	Generally Chesapeake Bay trib., Great Dismal Swamp, any county eligible, VA	MOU	Aug 95	Fees	Break-even
Maryland Non-Tidal Wetland Compensation Fund	MD	Permit	Jan 91	Fees	Break-even
South Atlantic Division					
Mitigation Solutions, Inc.	NW Duval Co., FL	Permit	10 Mar 95	Private	Maximize
Pembroke Pines (Florida Wetlandsbank)	Pembroke Pines, Broward Co., FL	Permit	28 Jun 93	Private	Maximize
Dade County\Bird Drive & North Trail Basins (an in-lieu fee program)	Everglades/Dade Co., FL	Permit	1989	Combination	Break-even
Vandross Bay Mitigation Bank	Lugoff, Wateree River, Kershaw Co., SC	Permit	27 Oct 94	Combination	Maximize
Friends Neck Wetland Mitigation Bank	Pee Dee River, Georgetown, SC	Permit	15 May 95	Private	Maximize
Millhaven Plantation (WET, Inc.)	Millhaven, Briar Creek, Savannah River, Screven Co., GA	Permit	18 Dec 92	Private	Maximize
North Central Division					
St. Charles	Otter Creek watershed, St. Charles, Kane Co., IL	Permit	12 Apr 94	Private	Maximize
Wadsworth	Wadsworth, IL, Des Plaines River watershed, Lake Co., IL	Permit	10 Apr 95	Private	Cost Plus
County of DuPage, Illinois	Addison, Illinois, DuPage River watershed, DuPage Co., IL	Permit	Oct 94	Combination	Break-even
Christian Properties (MN WCA Bank)	Sec 4, T120N, R23W, Wright Co., MN	Letter of Permission	10 Nov 93	Private	Maximize

* Only bank instruments or permits as signatory by Corps are identified. Non-Federal banking instruments and/or permits are not identified.

TABLE A-1. Operating Commercial Wetland Mitigation Ventures, Summer 1995 (continued)

Bank Ventures	Location (city/county/state)	Banking instruments and Permits*		Source of Capital (Private, public, mitigation fees, combination)	Financial Objective (Maximize, break-even, subsidized)
		Type	Date		
Ohio River Division					
Ohio Wetlands Foundation - Big Island and Hebron Sites	Scioto River, Marion Co., OH Licking River, Licking Co., OH	Letter of Permission	??	Combination	Break-even
North Pacific Division					
Astoria Airport Wetland Mitigation Bank	Clatsop Co., OR	MOA	Jan 86	Public	Break-even
West Eugene		??	??	Combination	Break-even
South Pacific Division					
Wildlands, Inc.	Sheridon (Bear River watershed), Placer Co., CA	Permit	14 Jul 94	Private	Maximize
Cottonwood Creek Mitigation Bank	Near Cottonwood, Cottonwood Creek, Sacramento River, Shasta Co., CA	Permit	28 Apr 94	Pubic	Break-even
Wikiup Mitigation Bank	Near Santa Rosa, Sonoma Co., CA	MOA	28 July 95	Private	Maximize
Bracut Marsh	Eureka, Humboldt Co., CA	MOU	1980	Public	Break-even
Lower Mississippi Valley					
Delta Land Trust	No sites selected yet	Final	21 Oct 1994	Combination	Cost Plus
Louisiana Nature Conservancy (Pine Flatwoods)	St. Tammany Parish, LA	Permit		Fee	Break-even
Cypress Island		??	??	Combination	Break-even

* Only bank instruments or permits signatory by Corps are identified. Non-Federal banking instruments and/or permits are not identified.

TABLE A-2. Proposed Commercial Wetland Mitigation Ventures, Summer 1995

Bank Ventures	Location (city/county/state)
North Atlantic Division	
Thomas L. Hance Mitigation Project	Prince Frederick, Calvert Co., MD
North East Mitigation Bank	Ford Run Watershed, Cecil Co., MD
Miller-Dobson Wetland Mitigation Bank	Mattawoman Creek, Charles Co., MD
Stancill's Sand & Gravel Wetland Mitigation Bank	Furnace Bay, Cecil Co., MD
Port Tobacco Wetland Mitigation Bank	Port Tobacco Creek, Charles Co., MD
Broadview Farms Wetland Creation	Zekiah Swamp watershed, Charles Co., MD
Bald Eagle Trust	Port Matilda, Bald Eagle Creek (North), Centre Co., PA
Hackensack Meadowlands Development Corporation	Hackensack River, incl. Bergen Co., NY
Woodbury Creek Wetland Mitigation Bank	West Deptford Township, Gloucester Co., NJ
Chimento	Oceanport, Monmouth Co., NJ
Clover Power Station Wetland Bank	Roanoke River floodplain, Halifax, VA
South Atlantic Division	
Lake Louisa & Green Swamp Mitigation Bank	Green Swamp, Lake Co., FL
Florida Rock Industries Mitigation Bank	Ft. Myers, Lee Co., FL
Poincianna Mitigation Bank	Lake Hatchinetta Basin, Polk Co., FL
Florida Power & Light South Dade Mitigation Bank	Everglades, Dade Co., FL
TFMTC-Dade County Wetland MitBank	East Everglades, Dade Co., FL

TABLE A-2. Proposed Commercial Wetland Mitigation Ventures, Summer 1995 (continued)

Bank Ventures	Location (city/county/state)
TFMTC-Lake Okeechobee Wetland MitBank	Lake Okeechobee, Glades/Henry Cos., FL
Little Pine Island Wetland Mitigation Bank	Matlacha Pass, Lee Co., FL
Split Oak Mitigation Bank	Orange Co., FL
East Central Florida Mitigation Bank - Ecobank	Chulauta, Seminole Co., FL
Mitigation Bank for Pine Savannah Wetlands in Coastal Mississippi	Lyman, Little Biloxi River (north of Gulfport), Harrison Co., MS
Grand Bay Mitigation Bank	Grand Bay Watershed, Sec. 8, T7S, R4W on MS/Al State line,
Marshlands Plantation	West of Woodbine, Satilla River, Camden Co., GA
Monastery Site	SW of Conyers, South River, Rockdale Co., GA
Croatan Wetland Mitigation Bank	New Bern, Neuse River Watershed, Craven Co., NC
Hidden Lake Wetland Mitigation Bank	Newfoundland, Albemarle Sound watershed, Tyrrell Co., NC
Neuse River Corridor Mitigation Bank	Goldsboro, Neuse River watershed, Wayne Co., NC
Scuppernong River Corridor Mitigation Bank	Columbia, Scuppernong River Watershed, Tyrell Co., NC
North Central Division	
Grand River Wildlife Area Mitigation Bank	GWRA, Farmington Township, Trumbull Co., OH
Orchard Hill Building Corp.	Orland Park, Illinois/Des Plaines River watershed, Cook Co., IL
Zumbro Wetlands Bank (Minnesota Wetland Conservation Act	SE1/4, Sec 30, T106N, R17W, Dodge Co., MN
Hobson Farm (MN WCA Bank)	Sec 29, T40N, R28W, Morrison Co., MN

TABLE A-2. Proposed Commercial Wetland Mitigation Ventures, Summer 1995 (continued)

Bank Ventures	Location (city/county/state)
Ohio River Division	
Coffee County Wetland Mitigation Bank	Near Manchester, Coffee Co., TN
North Pacific Division	
City & Bureau of Juneau Wetland Mitigation Bank	Juneau, Juneau Borough, AK
West Eugene Wetland Plan Mitigation Bank	West Eugene, Lane Co., OR
South Pacific Division	
Mystic Lake Mitigation Bank	Adjac San Jacinto River, City of San Jacinto, Riverside Co., CA
Santa Ana River Mitigation Bank	Santa Ana River, City of Riverside, Riverside Co., CA
Orchard Creek Associates	Orchard Creek (Bear River watershed), Placer County, CA
Sacramento County Vernal Pool Mitigation Bank	Morrison Creek watershed, Sacramento Co., CA
Vina Plains	Deer Creek, Tehama Co., CA
Valensin Ranch	Cosumnes River, Sacramento Co., CA
Medford Island	Sacramento-San Joaquin Delta, San Joaquin Co., CA
Klotz Property	Morrison Creek, Sacramento Co., CA
Southwestern Division	
Wetland Management, Inc.	East Fork Trinity River, Kaufman Co., TX
Katy-Cypress Mitigation Bank	Katy Prairie-Cypress Creek, Houston-Harris Co., TX
Galveston Bay Foundation Mitigation Bank	Bolivar, Bolivar Peninsula, Gulf Intracoastal Waterway, Galveston

TABLE A-2. Proposed Commercial Wetland Mitigation Ventures, Summer 1995 (continued)

Bank Ventures	Location (city/county/state)
Browning-Ferris Industries (BFI) Mitigation Bank	Katy-Prairie, Cypress Creek, Houston-Harris Co., TX
Garner's Bayou Mitigation Bank	Garners and Greens Bayous, Harris Co., TX
State of Arkansas	No site selected yet
Lower Mississippi Valley	
T.L. James	No sites selected yet
(not named) Benoit, MS (Tunica Co., Casino Ops)	North of Benoit, Bolivar Co., MS
(not named) Wolf River, TN	Wolf River & Shaws Creek watersheds, Fayette Co., TN



APPENDIX B. VENTURE SPONSORS AND REGULATORS INTERVIEWED

Steve Coker, Charleston Corps District
Greg Culpepper, Norfolk Corps District
Chris Dowling, Charleston Corps District
Steve Eggers, St. Paul Corps District
Mike Gheen, Huntington Corps District
Todd Gipe, Saint Johns Water Management District (Florida)
Elizabeth Guynes, Vicksburg Corps District
Bruce Henderson, Los Angeles Corps District
Phillip Hollis, Vicksburg Corps District
Brad Hubbard, Sacramento Corps District
John Jachke, Minnesota Board of Soil and Water Conservation
Lew Lautin, Florida Wetlandsbank
Richard Martin, The Nature Conservancy, Louisiana Chapter
Steve Martin, Norfolk Corps District
Mark Matusiak, Chicago Corps District
Jim Monroe, Sacramento Corps District
Michael Rolband, Wetland Solutions, Inc.
T. Logan Russell, Delta Environmental Land Trust
John Ryan, Land and Water Resources, Inc.
Vincent Squillace, Ohio Wetlands Foundation
Brooks Stillwell, WET, Inc.
Jacqueline Winkler, Philadelphia Corps District
David Zager, Ohio Wetlands Foundation

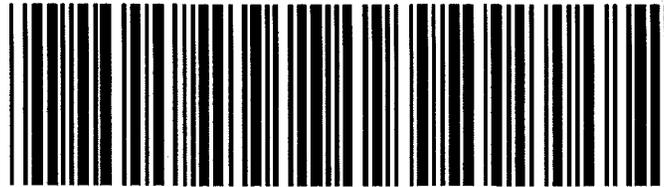


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