NATIONAL WETLAND MITIGATION BANKING STUDY
Commercial Wetland Mitigation Credit Markets: Theory and Practice

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[This work is among others of the National Wetland Mitigation Banking Study and represents an example of possible options for wetland mitigation banking. The findings and recommendations do not represent the position of the Department of the Army.]

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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 Environmental Law Institute and the Institute for Water Resources. This report presents bank-specific information obtained in an inventory of banks and detailed case study histories, an annotated wetland mitigation banking bibliography, and a summary of study findings on fee-based compensatory mitigation.

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. Summation of findings of phase one of the National Wetland Mitigation Banking 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. This report examines the wetland mitigation banking experience in detail. The report contains comprehensive bibliography on banking, and a compilation of all draft and Federal guidance documents on banking. The U.S. EPA and IWR co-funded this study. (This report is a very slight revision of a report published by the Environmental Law Institute in 1993).

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which sales may be made. Second, in order to assist regulators who write rules for individual ventures, some states and certain U.S. Army Corps of Engineers (Corps) districts and/or EPA regions have written regional (area-wide) policies or rules for commercial credit supply and use. These establish general standards for what needs to be considered in establishing operating agreements for ventures that would operate in the area. It should be noted that the Corp district-wide rules were developed prior to the development of national Federal guidance. Federal guidance (Army Corps of Engineers, Environmental Protection Agency, Fish and Wildlife Service, National Marine Fisheries Service, and Natural Resource Conservation Service) was proposed in the 6 March 1995 Federal Register, and finalized in the 28 November 1995 Federal Register. Corps district rules are expected to be consistent with this Federal guidance. A third approach to governing commercial ventures is to include their authorization in a wetlands resource plan that is watershed-based. A watershed-based plan views wetlands in the total landscape and tries to reconcile and relate development pressures to both regulatory and non-regulatory strategies for wetlands management.

Study Purpose and Method

The purpose of this study was to review and evaluate the existing experience with operating and proposed commercial credit ventures as well as established regional (area-wide) and watershed rules and guidance governing the operation of commercial credit markets. The study analyzes different types of credit ventures and the different ways that venture agreements have been written, and identifies factors that planners and regulators need to consider in their efforts to increase the opportunity for mitigation success through credit markets.

Increasing the opportunity for mitigation success through credit markets requires a policy that facilitates the emergence of ecologically successful and fiscally sound credit supply ventures. The study develops an analytical framework which identifies the economic and ecologic requirements for venture and market level success, and how they might be affected by alternative regulatory requirements for the establishment and use of credits.

The framework was then used to analyze and evaluate the experiences with and operating agreements for a set of commercial mitigation credit ventures which were operating or proposed as of summer 1994. The framework was also used to evaluate various area-wide and watershed rules governing the operation of commercial mitigation credit markets which were in effect as of summer 1994. The major findings and conclusions of these evaluations are summarized below.

Findings

Types of Commercial Ventures

This report uses two classifiers to describe types of commercial ventures. One classifier is venture financial objective, which describes whether a venture will price credits so as to maximize profit, obtain some limited return above costs, or to break-even. The second is the source of commercial capital, which describes whether the inputs used to produce credits come from private sector sources, public sources, fees collected for issued permits, or some combination of these sources. Examples of ventures were found for many of the twelve different venture types defined by this taxonomy. Those ventures whose commercial capital comes entirely from mitigation fee revenues are synonymous with the so-called in-lieu fee systems, although there are significant variations within this venture type. Most ventures capitalized with private resources or with combinations of capital sources have a maximize profit financial objective, while most of the publicly capitalized ventures have a break-even financial objective.

Private Ventures Face Regulatory Implementation Barriers

Despite their promise of economic and ecological success, most privately-capitalized credit ventures

have had to invest excessive time and effort to gain regulatory approval. Also, regulators and resource agency staff alike have been frustrated with the lack of a national policy for designing and implementing commercial venture agreements. There have been few publicly capitalized ventures, and (public) fee systems have been encouraged as primarily interim measures.

Agreements Authorizing Private Ventures Are Tailored to Site Specific Circumstances

While operating privately-capitalized ventures have only been selling credits for a short time, the agreements under which they were authorized generally match the determinants for success established in this report. Importantly, the agreements in each case were tailored to be sensitive to the particular economic and ecological circumstances faced by the venture.

Assurances Against Failure Are Most Stringent for Private Ventures

Some ventures have low commercial costs of production (deemed relevant to attainment of the financial objective) because they have true cost advantages or because they use different judgments about which expenses to count as commercial cost. If these two factors have no influence on the ecological success of the venture, then the regulatory process need not favor mitigation credits from one venture over another. On the other hand, the publicly-capitalized ventures studied for this report (and some fee systems) appear to employ different cost accounting systems than the private ventures which may not offer adequate financial assurance against mitigation failure. In addition, it appears that the regional rules and guidance studied for this report do not require careful cost accounting practices and often do not require assurance against ecological failure in the case of publicly-capitalized ventures. It should be noted that inadequate assurances for success (whether cost accounting, oversight, or financial assurances) are characteristic of the first few operating public ventures; the more recently implemented public ventures may have improved oversight mechanisms.

Demand for Venture Credits May Be Limited by Area-Wide Rules and Guidance

A strong demand for venture credits can increase the potential for economic success of commercial credit ventures. Regulatory factors that would increase credit demand include allowance for sales to multiple sub-markets, large market service area, and regulatory consistency among off-site and on-site mitigation. The venture agreements studied in this report generally do not unduly restrict the market area or the sub-market into which credits can be sold; however, the area-wide rules now in place suggest that there should be specific limitations on venture sales possibilities (e.g., within watershed). Area-wide rules and guidance for credit trading also emphasize the predominance of sequencing and are often silent on the mitigation quality assurance that would be expected for the on-site mitigation option.

Watershed-based Planning Is Not Necessary for Venture and Market Level Success

Watershed-based wetlands resource planning to support commercial ventures has included multiple stakeholder participation for trust-building, technical protocols for detailed wetlands identification, and categorization based on watershed goals. The logic offered by the plans is that categorization of wetlands in the plan substitutes for sequencing when each individual permit application is filed. However, preparation of detailed parcel-level categorization can be costly and time-consuming, and there is a risk that the planning process may end without agreement. On the other hand, most existing commercial ventures have been authorized to operate, and are operating with a high potential for economic and ecological success, without reference to watershed-based plans. There may be valid reasons for initiating watershed-based wetlands resource planning, as practiced in its most extensive form, to categorize wetlands in a landscape setting for both regulatory and non-regulatory wetland management programs. However, the support offered to commercial venture success does not appear in itself to be a sufficient reason to incur significant watershed planning costs.

Conclusions

This study was conducted under the premise that commercial ventures sales are an acceptable instrument of wetland mitigation policy. The following conclusions are offered in support of increasing the prospects for the success of commercial credit trading.

A national policy is necessary to (1) affirm the support for commercial credit markets, (2) describe general principles that field offices can use to prepare venture agreements, and (3) assist in the development of area-wide rules and guidance tailored to regional circumstances.

Flexibility in national policy and area-wide rules and guidance is needed to accommodate situation-specific conditions faced by commercial ventures under terms that will maintain the likelihood of ecologically successful mitigation and economic viability. Such rules and policies should establish a conceptual framework and general principles for designing venture agreements, and include illustrations of alternative ways to meet the general requirements for success.

Quality control requirements that apply to all ventures, without regard to venture type, should include performance standards, monitoring and maintenance requirements, and long-term site protection and management. Financial assurance against mitigation failure would also be expected, unless venture sites have a high probability of immediate ecological success.

Cost accounting and credit pricing practices for publicly capitalized ventures should account for all project costs in the pricing of venture credits to assure that credit sales revenues are adequate to secure long-term ecological success.

Expanded mitigation requirements for certain general permits and state and local regulatory programs would increase the demand for credits, and thus the prospects for venture- and market-level success. The simplest local approach may be to require a small fee for permits issued under these programs (i.e., in-lieu-fee mitigation). To minimize the possible assertion that a fee requirement, no matter how easy it makes it to obtain the fill permit, is an intrusion on land use rights and an unnecessary regulatory burden for limited environmental gain, the smallest fills could be exempted. However, such programs must incorporate consistent quality control requirements that apply to all ventures to ensure ecological success and the appropriateness of the mitigation.

Consistent quality control requirements (and their enforcement) for mitigation across on-site mitigation projects and off-site credit ventures would increase the demand for venture credits. The same quality control rules that apply to the authorization of credit market ventures should also apply to on-site mitigation efforts.

Mapping of wetland sites using low-cost approaches that draw on existing data sources would help ventures assess the potential demand for credits in their potential sales area. Review of permitting trends and analysis of regional growth rates would also assist ventures in determining credit demand.

Carefully considered, ecologically justified deviations from sequencing (e.g., in context of watershed plans) would provide greater certainty and may increase the demand for credits. One initial step could be to request that fill-permit applicants be encouraged by regulators to justify how the use of venture credits might be an ecologically superior alternative to avoidance, minimization, or on-site mitigation.

ACKNOWLEDGMENTS

This report was prepared by Paul Scodari, Leonard Shabman, and David White through a contract to Virginia Polytechnic Institute, Blacksburg, Virginia, in conjunction with the National Wetland Mitigation Banking Study (hereafter referred to as the National Study) conducted by the U.S. Army Corps of Engineers, Institute for Water Resources (IWR). The report was prepared under the direction of Dr. Robert Brumbaugh, IWR manager of the National Study, and Dr. Eugene Stakhiv, Chief, Policy and Special Studies Division.

The First Phase Report of the National Study recognized that the most innovative aspects of mitigation banking, and the greatest opportunity for banking to be available to the "every-day" permit applicant that requires compensatory mitigation, is in the arena of commercial mitigation credit supply ventures. Regulatory and resource agency staff are being requested by both the private and public sectors to consider new ideas. This study was designed to provide regulatory and resource agencies, as well as prospective investors, with an understanding of regulatory influences on the ecological and economic success of commercial credit ventures.

IWR tasked the report preparers to conduct review and evaluate the practice of commercial banking to date. They were asked also to examine how banking has been approached in watershed-based wetlands planning. Relevant participants in the respective commercial banking planning efforts and watershed studies were interviewed. A list of those interviewed is presented in Appendix B.

Thanks are extended to those who reviewed drafts of this report in addition to Drs. Brumbaugh and Stakhiv: the late Ms. Julie Metz (at IWR when she reviewed this draft), Mr. Richard Reppert (IWR), Dr. Fari Tabatabai (Los Angeles Corps District, then Temporary Detail to IWR), Ms. Aimee Dimmerman (IWR), and Mr. Tom Kelsch (U.S. Environmental Protection Agency, Wetlands Division). Thanks go also to others who reviewed parts of the draft report, including: Dr. Mary Lee Plumb-Mentjes (Alaska Corps District); Mr. Ken Scarlatelli (Hackensack Meadowlands Development Commission); and Ms. Jean Evoy (Dade County Department of Environmental Resources Management). Mr. Brian Chromey and Ms. Catherine Lisle provided editorial assistance for the draft and final report. Thanks are also extended to all those listed in Appendix B who provided information on specific programs and ventures.

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CHAPTER ONE. INTRODUCTION

Wetland policies at Federal, state, and local levels often include the goal of no-net-loss in wetland acreage and function, to be followed by net gain. Toward this end, the nation has sharply reduced the primary source of wetland loss—agricultural conversions—in part through policy actions designed to reduce the economic return to drainage and filling (Kramer and Shabman 1994). Further, a variety of Federal and state wetland restoration programs have been authorized and are operating (Interagency Committee 1992). Meanwhile, efforts being made to clarify the Federal regulatory program, the Clean Water Act Section 404 permit program, as well as similarly structured state permitting programs, have helped to define their purpose, scope and influence on wetland filling.

However, controversy continues to surround wetland-fill permit programs, especially over the standard decision processes for the granting of fill permits. The permitting process is, by formal regulation, expected to follow a logic based on "sequencing," where the applicant for a fill permit must first show that the proposed activity has been designed to avoid wetlands to the maximum extent. If avoidance is not possible, then the minimization of filling must be achieved. Finally, if a permit is granted, compensation by restoration of degraded wetlands or by creation of wetlands from uplands to replace the unavoidable effects on wetlands is required. Traditionally, compensation has been subject to strict priorities, where the first option is to make the replacement on-site (as close as possible to the permitted activity) and of the same kind of wetland. The in-kind, on-site, preference is expected to reduce the likelihood that specific wetland functions will be lost when the compensation site is substituted for the filled site. The Federal mitigation banking guidance encourages "ecological" sense in making on-site versus off-site mitigation decisions.[1]

However, permittees have been allowed to compensate in other ways when regulators have determined that on-site possibilities for wetlands construction or restoration are technically limited. Some permittees develop a single off-site compensation project to offset wetland losses caused by one or more of their development projects. These off-site mitigation projects represent a "deposit" of mitigation credits made by the applicant, and the deposit is drawn down as wetland fills requiring compensation are permitted. This is the general understanding of a single-user mitigation bank (Institute for Water Resources 1992, 1994a).

At other times, the individual permit recipient has only one small project or limited resources for developing a single user bank site. In such cases, regulators have often allowed permittees to satisfy their mitigation requirements by paying a fee to a government or non-profit conservation agency to be used for that agency's conservation programs. In effect, employing either of these alternatives to on-site and in-kind compensation has become an additional, but last step, in sequencing.

Private property and development interests insist on the need to improve the efficiency of wetland regulation, arguing that the sequencing procedures are inflexible, cumbersome, lead to unnecessary costs and delays in wetland permitting, and result in a net loss in the wetland resource.[2] Shabman, et

[1] "Federal Guidance for the Establishment, Use, and Operation of Mitigation Banks," Federal Register Document 95-28907, November 28, 1995 (U.S. Government, 1995b).

[2] See Shabman et al., 1994, and Institute for Water Resources, 1994a, for a review.

al. (1994) feel that increased regulatory flexibility can increase the protection of wetland functions and reduce the regulatory burden. Specifically, they note that protected wetland acres often wind up being surrounded by development that compromises their functions and values. This also can occur if the compensatory wetland is required to be near the permitted development. For these critics, inflexible sequencing, which keeps wetlands acres where they cannot function over time, compromises the no-net-loss goal. Regulators at times acknowledge these criticisms but often deny that the sequencing process is as rigid in practice as the rules suggest (Thompson 1994).

On the other hand, any suggestion that sequencing is not closely followed motivates a different group of program critics. For some of them, skepticism about sequencing flexibility is based on a belief that there are insurmountable scientific barriers to wetland restoration and creation (Roberts 1993, The Wildlife Society 1994). For others, the skepticism is based on a lack of trust in the regulatory process. These people feel that regulators will not ensure that mitigation wetlands will be built properly, or even built at all (Chesapeake Bay Foundation 1994).

Amid this controversy, the regulatory innovation of commercial credit markets has been discussed with increased interest. Because mitigation of wetland losses is required when a permit is issued, *commercial mitigation supply ventures* have offered to sell wetland credits (some measure of area and functions of wetlands restored or created) to permit recipients who are required to compensate for their projects' effects on wetlands.

Commercial (credit) ventures have appeared in many different institutional forms and operating characteristics, with suppliers in both the public and private sectors. Although there has been gradual Federal agency support for such ventures, in many parts of the country such efforts are advancing in response to local or state initiatives. In some cases, mitigation supply ventures sell credits for permits where mitigation is not required by Section 404, but is by local or state regulations.

A *mitigation credit market* emerges when one or more ventures sell credits to one or more permit applicants for a price established by bargaining among sellers and permit applicants. The distinguishing feature of these markets is not the money-for-credit transactions. Indeed, when permittees conduct on-site or single-user bank mitigation, they often hire consultants to plan and construct the mitigation projects. *The important distinction between credit markets and these other mitigation options is that credit market sales also transfer responsibility (legal and financial liability) for mitigation failure from permittees to credit ventures.*

Regional markets for mitigation credits are influenced by two roles of government. First, credit markets could not exist in the absence of government regulations which create the demand for wetland development permits and make the granting of permits conditional on compensatory mitigation. Second, permit applicants seek the lowest price credits. Therefore, unless government regulators, not the buyers of mitigation credits, impose quality control on mitigation sellers, the mitigation sold may not be ecologically successful. Mitigation quality control is thus a critical responsibility of the regulatory agency. For example, one important tool to assure quality is to require ventures to post a financial assurance that can be used to repair a failed mitigation site and to maintain a successful site over time (Shabman et al. 1994).

The new regulatory challenge is to establish rules that assign clear legal and financial liability for mitigation failure to credit sellers. In seeking to achieve mitigation success through credit markets, there are two levels at which success must be achieved—venture level and market level—where success is defined in both ecologic and economic terms. At the *venture level, ecological success* means that a venture's replacement wetlands successfully reproduce the lost functions associated with the filled wetland. Ecological success can only be assured if there are rules to define the quality of replacement wetlands and to define liability for failure to provide that quality. *Economic success* means that the venture's sales

revenues are sufficient to cover its costs of producing credits. More specifically, economic success requires that ventures can meet their financial objectives. Private firms might supply mitigation credits if the prices received for credits in relation to production costs offered a competitive return to their investment. A government agency might supply mitigation credits if the prices it received for credits were adequate to recover the government's cash costs of producing the credits.[3] This suggests that the quality control rules should be applied in such a way that the costs of supply are not raised to the point that credit prices are pushed beyond that which permit applicants would be willing to pay.

Market level success means that the total output of all ventures is ecologically successful and able to meet the demand for credits for the area being served, at prices that recover production costs. A vigorous market is one in which competition among sellers is possible. Competition can raise the quality of mitigation, force the search for new creation and restoration approaches, and offer regulators a wide array of wetland types and locations for mitigation. Market level success requires that quality control rules apply uniformly to different types of commercial ventures, to mitigation done by commercial ventures, and to permittees who compensate on-site.

There are three different contexts within which wetland credit ventures have been considered and rules for their operation imposed. First, plans for specific ventures have been reviewed by wetland regulators. Based upon negotiations between the venture proponents and a regulatory agency, an operating instrument, such as a formal memorandum of understanding, specifies the conditions under which mitigation credits will be certified for sale and the terms under which sales may be made. For example, an agreement may specify the amount of a performance bond and the criteria that will be used to determine when the bond may be returned. As another example, the agreement may specify the area in which credits might be sold. The agreement that establishes the venture's operating rules does not assure that the credits will, in fact, be sold or that they will be sold at a particular price. The demand for venture credits is established, indeed controlled, by wetland regulators because the fill-permit review process determines the demand for venture credits. For example, if strict sequencing is applied to any permit application, then the applicant is less likely to seek credits from a commercial venture. If the scope of wetland regulation is reduced—for example, by changing wetland delineations—then the overall demand for fill permits and, hence, for credits decreases. Therefore, regulators have control over a venture's economic success directly when they certify credits for sale and indirectly through the fill-permit process that determines the demand for mitigation credits.

The second context within which wetland credit ventures have been considered and guidance imposed are regional and local guidance or umbrella agreements. In order to assist regulators who write rules for individual ventures, some "political" jurisdictions have written regional (area-wide) rules or guidelines to govern the preparation of individual venture agreements within the geographic area covered by the jurisdiction. Such guidance has been established by some individual states for their wetland regulatory programs and by certain Corps districts for permits under Section 404. On March 6, 1995, the Federal government issued draft national guidance for mitigation banking, acknowledging commercial ventures (U.S. Government 1995a). The guidance was finalized on November 28, 1995. In those cases where area-wide rules have been put in place by Corps districts, it would be expected that there would be a conformance of those area-wide rules to the final guidance. In areas where there are no area-wide rules, individual venture agreements might refer to the national guidance on the necessary content of individual venture agreements. However, it is worth emphasizing that area-wide rules are expected to offer only general standards for what

[3] A government agency might also supply mitigation credits if it perceives other benefits, e.g., an increased tax base, from providing cost-effective mitigation.

needs to be considered in a venture-specific agreement. Individual venture agreements can then be tailored to site-specific circumstances.

A third approach to setting guidance or rules for commercial ventures is the watershed-based wetlands resource plan. In general, watershed-based plans view wetlands in the total landscape, and are to reconcile and relate development pressures to both regulatory and non-regulatory strategies for wetlands management. The boundaries of watershed-based plans may roughly conform to a drainage area, but the boundaries of local or regional political jurisdictions usually describe the watershed plan area. Within the planning boundary for the watershed, guidance is established to govern the operation of commercial ventures. In these cases, the guidance is derived and related to the wetlands circumstances in the watershed as a first consideration. If the watershed falls under a jurisdiction with area-wide guidance, then the watershed venture would need to meet those criteria. In a watershed-based planning context, guidance governing credit ventures is established with the expressed interest of serving the purposes of the wetlands plan. This may mean, for example, that ventures are expected to provide a certain wetland type or be in a certain location. It also means that ventures may have more certain demand for their credits, if the watershed-based plan specifically addresses the venture rules and rules governing the issuing of fill permits. In fact, the explicit attention in watershed-based plans to both venture agreements <u>and</u> to procedures for issuing fill permits is what distinguishes watershed-based plans from individual venture agreements and area-wide rules.

Study Objectives

This report was prepared as part of the National Wetland Mitigation Banking Study (hereafter referred to as the National WMB Study) conducted by the U.S. Army Corps of Engineers Institute for Water Resources (IWR). The First Phase Report (IWR 1994a) recognized that the most innovative aspects of mitigation banking, and the greatest opportunity for banking to be available to the "every day" permit applicant that requires compensatory mitigation, involved commercial credit trading. This study was conducted to address the issues associated with the concept. The study objectives were as follows:

1. Describe the demand and cost conditions necessary for achieving venture and market level mitigation success.

2. Develop a taxonomy which illustrates the different possible types of credit ventures, and to review and evaluate the operating agreements developed for and existing experiences with operating and proposed credit ventures in order to:

   a) determine how alternative venture provisions may influence the prospect for venture level mitigation success, and

   b) determine how prospects for success may differ across alternative venture types, including private, public, and fee-based ventures.

3. Review and evaluate existing area-wide rules governing the operation of commercial credit ventures in order to:

   a) determine how existing area-wide rules may influence venture and market level mitigation success,

   b) determine whether the existing area-wide rules may have different influences on private, public, and fee-based ventures.

4. Review and evaluate watershed-based wetlands resource planning efforts intended to support venture and market-level mitigation success in order to determine the contribution of planning to commercial credit trading.

Study Approach

The economic and regulatory requirements for venture and market level success were developed

in general terms in a previous report prepared for the National WMB Study (Shabman et al. 1994). This report refines and expands that analytical framework and uses it to review case studies of operating ventures, proposed ventures, existing area-wide rules governing commercial credit sales, and watershed plans. The review of case studies was completed in the summer of 1994. It should be recognized that the status and circumstances of many of the reviewed ventures may have changed since that time. The study framework is presented in Chapter 2. The first part of Chapter 2 describes the operation of a mitigation credit market using an economic demand and supply framework. Chapter 2 concludes with a list of factors that are determinants of mitigation success, organized around the demand and supply framework developed earlier in the chapter.

Chapter 3 reviews and evaluates the experiences of operating ventures. (Appendices A and B provide lists of the literature reviewed and the persons interviewed, respectively, in connection with the venture case studies.) In order to organize that discussion, a taxonomy of commercial credit ventures is used to classify the commercial ventures used as case studies. Chapter 4 reviews and evaluates the area-wide rules now in place and Chapter 5 reviews watershed-based wetlands resource planning experiences where support of commercial ventures was a planning purpose. Chapter 6 summarizes the findings of the case study evaluations. These findings are intended to assist Federal and non-Federal wetland managers in promulgating rules that will secure the ecologically and economically successful operation of commercial credit ventures.

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CHAPTER TWO. VENTURE AND MARKET LEVEL SUCCESS

Venture and Market Success: A Conceptual Overview

The venture and market level economics of a commercial mitigation credit trading system are graphically depicted in Figure 1. Panel "a" depicts the complete market for wetland mitigation credits, where a market is defined as the relationship between the demand and supply of credits in some geographical area. The demand side of the market is made up of the consumers of wetland credits, the permittees. The demand for credits (D_1) is a downward-sloping curve showing that there is a negative relationship between the price and quantity of credits demanded: the higher the price of credits, the less that consumers are willing to buy. The supply-side of the market is made up of the sellers of wetland mitigation credits, the commercial mitigation credit ventures. The supply of credits (S_1) is an upward-sloping curve showing that there is a positive relationship between the price and quantity of credits offered for sale. In other words, the higher the price of credits (i.e., the more they can charge the consumer), the greater is the willingness of ventures to supply credits. The ventures of course want to charge a high price, whereas the consumers want to pay a low price. As long as demanders are willing to pay a price greater than the cost to supply credits, more credits will be produced. At some point permittees' willingness to pay for credits is just equal to the cost of supplying them. The price that will be charged is that price where the quantity of credits demanded are equal to the quantity of credits supplied. This occurs at the intersection of the two curves.

The intersection of these two curves can occur at different price levels due to shifts in either credit demand or supply. The demand for venture mitigation credits is a function of: overall development pressure, the relative return from development on wetlands compared to uplands, the expectation of receiving a wetland development permit, the costs of mitigation undertaken by the permittees relative to that from the purchase of venture credits, and regulatory permission to deviate from the sequencing requirements to use on-site mitigation. For example, if the relative return from developing wetlands was low this year, the demand curve would shift to the left, representing a decrease in demand at any given

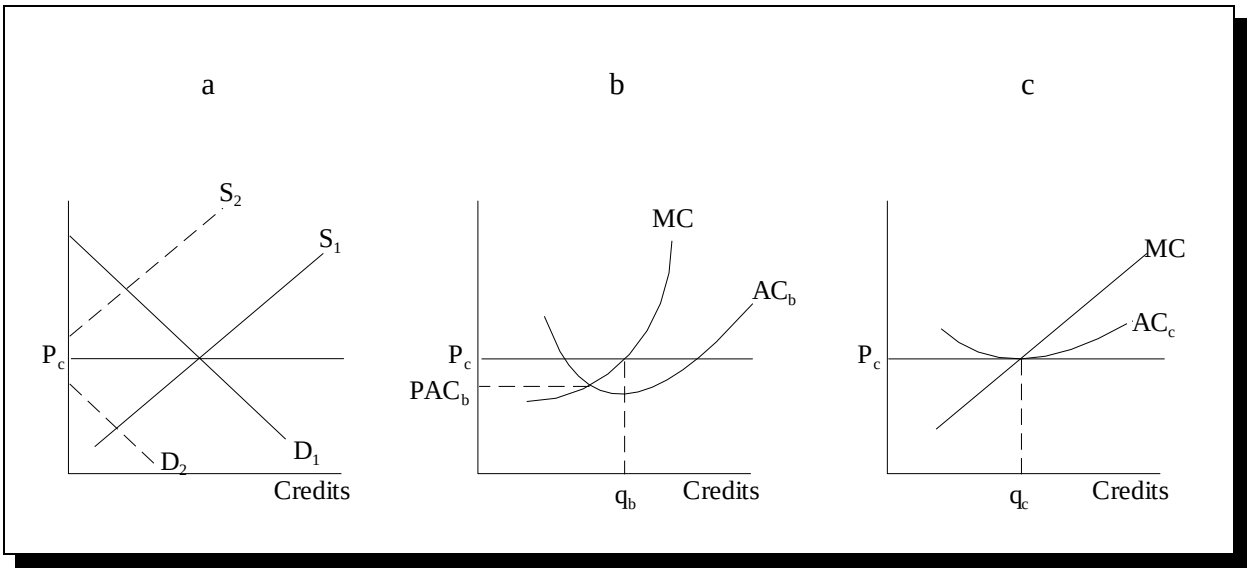

Figure 1. Venture Level and Market Relationships for Commercial Credit Supply

credit price, as shown by (D_2).

Credit supply is a function of the costs that ventures incur when producing credits. These costs include some *cash outlays*, such as: the hiring of wetlands restoration or creation experts to develop plans; hiring the legal services to secure permits and approvals; acquiring land; undertaking construction to create or restore necessary hydrology, soils and vegetation; monitoring and maintaining a venture site over time; and posting a financial assurance bond. Cash costs from the assurance bond derive from portions of the bond not being returned, or repair costs incurred to earn the return of the full bond amount in the event of site failure.

Costs may also include charges that are not cash outlays, but are *financial opportunity costs* of the venture. Consider the costs of a *mitigation success assurance bond*. The opportunity cost of a performance bond would be the interest charges on the cash value of the bond until its reimbursement by the regulatory agency (once the site has been certified as successful). The magnitude of this opportunity cost is determined by the delay from the time cash costs are incurred until sales are made, and whether the bond is returned with or without accrued interest.

Subtleties in defining costs arise from the use of inputs that are donated to, or already owned by, the credit venture, but which cannot be sold. For example, if land is donated by an entity unconnected to the venture, and this donation is contingent upon its use for credit production (i.e., it cannot be sold or used for another purpose), then its use for this purpose would entail no opportunity costs to the credit supplier. If the land is owned by the venture before the venture begins a wetland creation or restoration, and that land has a re-sale (salvage) value, then that forgone sales value is a financial opportunity cost. However, the opportunity costs of lands or other inputs already owned by credit suppliers, but which cannot be sold, are at most the value of the foregone services they could have provided in their next best alternative uses.

Government ventures might use lands that they already own but which are dedicated to wildlife habitat, biological diversity, and other compatible uses for credit production. When such lands are required to be held in public trust in perpetuity, and the services they provide would not be foregone if the lands were employed in credit production, then their use for credit production would entail no opportunity costs to credit suppliers.

The costs that an individual venture faces when increasing the supply of credits it can offer for sale are depicted by a marginal cost curve. The market supply curve is the sum of the marginal cost curves for all ventures in the relevant market area.[4] Regulatory rules affect venture costs, and therefore market supply, by establishing mitigation design and performance standards, monitoring and maintenance requirements, cost liability for project failure, and provisions for long-term site ownership and management (Shabman et al. 1994).

Insignificant demand for credits may result from the regulatory rules. For example, limiting the amount of land regulated as wetlands would limit demand for mitigation credits. Also, high costs of producing credits may result from the regulatory rules. For example, rules that prohibit credit sales for extended periods of time after wetlands restoration may result in significant interest charges on invested capital. The possibility of no market trading is illustrated in panel "a", where low demand (D_2) and high cost supply curves (S_2) designated by dashed lines do not intersect at a positive quantity.

Panels "b" and "c" are "representative" of the numerous ventures that might contribute to the market supply. Given D_1, these ventures face a

[4] If there were only one venture, the marginal cost curve for that supplier would be the market supply curve; however, the monopoly position of the supplier means that it might set prices above the equilibrium price shown. This possibility, while a realistic one, need not be developed to illustrate the market's operation.

credit price of P_C. The marginal cost of producing additional credits for each venture is shown in each panel. The ventures can maximize net returns in the short run by producing q_b and q_c credits, at price P_C.[5] Also depicted in panels "b" and "c" are the average cost (AC) curves for the ventures. AC_b lies below Ac_c. Therefore, venture "b" earns a net return (price above average cost) that is greater than that earned by venture "c". This difference in net return may be attributed to a unique skill (restoration expertise) or asset quality (location of mitigation land) that is owned by a venture and that can not be replicated by others. The economic term for the return to these unique assets is economic "rent." In this depiction, the total market is supplied by ventures with these different cost structures, but some ventures will earn higher net returns than others. Note that all the ventures expect to recover "commercial" costs of production at the price P_C.

Commercial costs are the costs that the venture deems relevant to the attainment of its financial objective. Specifically, the process needed to maximize profit, earn costs plus a small mark-up, or to break-even can only be understood by first defining the venture's commercial costs of producing credits. Commercial costs are not necessarily comparable across different ventures, but are specific to the circumstances of particular ventures. For example, a government venture may not assign a cost to the venture manager's time if that manager is paid from general tax revenues. That the manager is not providing other public services with that time, or that the manager would not be on the payroll at all if there were no venture, may not be considered relevant to estimating commercial cost. Such a possibility would not be a factor in a private venture, because the salary of the management would likely be tied to the venture's cost. For both private and public ventures, donated inputs are unlikely to be considered a commercial cost if they can not be dedicated to an alternative use. When an alternative use for donated inputs is possible, some ventures may choose to count them as a financial opportunity cost and others may not.[6]

[5] This follows the decision rule to set price equal to marginal cost to maximize net returns.

[6] While the judgement of the managers of the venture will be a determinant of what counts as a commercial cost, the accounting practices employed also are likely to determine whether commercial costs will include all or only some of the cash and opportunity costs. In fact, public ventures have been more likely to employ *cash accounting* practices. Their private competitors will more likely employ *accrual accounting*. The advantages of an accrual accounting system are being increasingly recognized by local government accounting experts, although legal and institutional barriers stand in the way of a transition (Henke 1988, pp. 91-117).

In cash accounting, expenses are subtracted and receipts are added as they occur. The account balances at any time reflect a current cash position. Accrual accounting systems reflect the long-term financial status of the entity by including future liabilities and assets. The accrual account balance at any time may be quite different from the cash balance. For instance, on the liabilities side, unpaid expenses like depreciation and future commitments to salaries and wages or capital investments might not appear on cash accounting systems. Capital expenditures appear in cash systems generally as the cost incurred in the year purchased. On the asset side, uncollected or anticipated future revenues and accrued but not received interest income would appear in accrual, but not cash accounts.

State and local governments commonly employ cash accounting, because it is simpler to understand and, because the cash balance is often the subject of public concern, it reflects actual cash on hand. Advantages of an accrual system are more evident when unpaid bills (future liabilities) or uncollected revenues (future sales) are significant to the economic condition of the venture. Therefore, accrual accounting would be used by a private entity seeking to price credits in a way that assures a competitive return—relative to the other business opportunities it may undertake—from its participation in commercial mitigation credit ventures.

Two implications for commercial credit ventures follow from these differences in accounting systems. First, a focus in cash accounting systems on the cash balance discourages counting the salvage value of donated or owned assets or forgone interest on invested capital as commercial cost. Since public entities are

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With the possibility of different commercial cost structures in mind, re-interpret panels "b" and "c". In this re-interpretation, the low average unit cost ventures in panel "b" might be the government ventures that consider neither land or management as commercial production costs. Panel "c" shows private ventures that purchase or lease land for restoration sites, and that must pay a wage to its managers, will face higher commercial cost. As long as the government ventures will accept returns above cost, then the market price stays at P_C and the government ventures in panel "b" earn an economic rent for the advantages of land ownership and having managers on the public payroll. The private ventures in panel "c" earn returns equal to commercial costs, and between private and public ventures the market demand at the market price is met.

Now suppose that the government venture has a break-even financial objective. By seeking to recover only its commercial costs, it prices its credits according to its commercial cost of production, at PAC_b. In this case, no rents are earned by the government and the demand for credits will first be met from the ventures in panel "b". If ventures like b do not expand production beyond $q_{b,}$ then the rest of the credits will be sold by ventures like "c" at the higher price P_C; ventures like "c" still will be economically successful. Alternatively, there is the possibility the government can develop more ventures with a cost structure identical to venture "b" and that these will meet the rest of the market demand at a price PAC_b. In that case, the whole market will be served by the government ventures and the private ventures like panel "c" will not be economically viable.

The environmental management purpose of commercial credit sales is to assure the ecological success of mitigation. The previous discussion illustrates that the market will be dominated by ventures (1) that have cost advantages, (2) that have accounting perspectives and/or make accounting judgements that do not consider certain expenses to be costs, and/or (3) that have a financial goal other than to maximize net returns. If these three factors have no influence on the ecological success of the venture, then there is no basis for the regulatory process to favor one venture over another. On the other hand, if the advantage arises because one venture is not offering the same assurance of ecological success as others (for example, no financial assurance cost has been included in the commercial cost structure), then the regulatory process might want to consider this factor in determining the conditions for use (debiting) of the venture by permit applicants.

Determinants of Ecological and Economic Success Through Mitigation Credit Markets

Commercial ventures are ecologically successful when the credits they sell result in wetland acres and functions that replace those lost from the fill permits they serve. Commercial ventures are economically successful when their sales revenues

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[6](...continued)
most likely to use cash accounting, they may compute commercial costs exclusive of these items. And because private ventures are much more likely to have an accrual accounting system, they are likely to charge higher prices for credits to cover these costs.

Second, cash systems that have a break-even financial objective discourage the creation of surplus cash reserves for possible future liabilities, such as would be covered by a mitigation success assurance fund. If cash reserves build up, the venture is subject to the charge that it is exacting too much from permit applicants. While cash accounting does not prohibit the creation of a set-aside for future liabilities, the philosophy behind cash accounts is not supportive of the idea. Conversely, an accrual system will direct attention to possible future liabilities as a cost determinant. The point is not that accrual is necessarily a "better" accounting system. However, an essential requirement to increase the likelihood of attaining ecological success in mitigation is that there be a financial capability to repair or replace failed mitigation sites. If costs to cover expected future failures are not set aside, then credits will be under priced.

are sufficient to meet the financial objectives of the venture. Increasing the opportunity for ecological and economic success requires regulations that facilitate the emergence of fiscally sound credit ventures. Even where there is a strong potential demand for credits, regulatory rules should encourage market entry by avoiding actions which reduce the demand for credits or increase production costs above what is needed to secure ecological success. Factors contributing to ecological and economic success, as determined by the rules governing the operation of ventures, are described in this sub-section, organized by the conceptual demand and supply perspective.

Factors Influencing the Supply and Cost of Credits

Quality Control: Regulator concerns about commercial credit ventures generally focus on the risk of mitigation failure, since the sale and use of credits transfers responsibility for failure from the permittee to the venture.[7] To address these concerns, regulators could impose a set of interrelated venture rules to increase the probability of ecological success. More detailed review and analysis of these rules, as applied to private credit ventures, can be found in Shabman et al. (1994).

To begin, the rules for a specific venture must include a clear statement of the expected performance standards, that is, a definition of success criteria. Criteria are needed to determine when a venture's mitigation parcel is failing and has failed. These might include schedules for the achievement of wetland definition criteria, and vegetation goals relating to type, abundance, and persistence. These criteria should also provide some leeway to account for less-than-extreme natural events which may cause replacement wetlands to evolve along a somewhat different path than originally planned, but one that nevertheless provides desired wetland functions and values. In the agreement that establishes the venture, the means of measuring the success of the venture as well as the success criteria should be clearly spelled out.

The various quality controls that will be necessary for assuring success will include in some combinations: monitoring and short-term maintenance, long-term site protection and management, time of permitted debits, and requirements for financial assurances that can be used to repair failures. However, rules that address these four matters impose costs on the venture and if these costs are significant, permittees may be unwilling to pay a price for the credits which covers commercial costs. Of particular importance in terms of program efficiency is whether the combination of rules are redundant (or duplicative) adding to unnecessary costs. Of course, the treatment of these costs by different types of ventures may determine whether the credit prices will in fact be "too high" for the permittees.

Monitoring and Maintenance: Credit ventures should be required to monitor and report on the progress of mitigation sites toward successful wetland creation or restoration (as determined by the performance standards) on set schedules, and to correct uncovered deficiencies. The monitoring period should be limited to a reasonable time frame, however (e.g., five years or until success criteria have been met). The costs of monitoring and maintenance would be borne by the venture and incorporated into the cost structure used to set credit prices.

Long-term Site Protection and Management: Regulators should require mechanisms to ensure that venture mitigation sites retain their wetland status in perpetuity,[8] and receive active long-term

[7] The use of venture credits by a permittee must be approved by the regulator; the actual purchase of credits by a permittee from the credit venture is a business transfer (i.e., monetary transaction) and not a regulatory matter.

[8] There are cases where banked wetlands compensate for wetland losses of a more-or-less known duration, e.g., Fina LaTerre Mitigation Bank, where the wetlands disturbed are not expected to survive 80 years in any event (IWR 1994a). For these instances, long-

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management if necessary. This can be accomplished using a several possible contract provisions. The ability to sell the site for a non-wetland use might be restricted by requiring a plan to transfer the site to public ownership or some conservation entity through permanent easements and deed restrictions. Also, contracts might require ventures to establish some form of endowment with the interest dedicated to perpetual management. The endowment might be put under the control of a resource agency or non-profit conservation group which may also have received title to the restored or created wetland. The cost of the endowment would be included in the commercial cost of the venture.

Timing of Credit Marketability: One means to assure that a credit venture achieves mitigation success is to not allow credit sales until the replacement wetland is certified successful in accord with the performance standards. If the calculation of commercial costs by the venture includes interest charges on invested funds (i.e., opportunity costs of invested capital) then this rule would dramatically increase production costs. Private suppliers, who will likely include such charges, have a strong preference for selling credits as early as possible relative to the actual provision of replacement wetlands so they do not need to tie-up large amounts of money for extended time without any cash flow from credit sales. If early credit sales are allowed (defined as sales before the site is certified successful), then other venture rules to establish cost liability for failure assume more importance.

Cost Liability for Failure: Early credit sales may be warranted when venture rules allocate cost liability for failure. Under such rules, the venture would be responsible for correcting any detected deficiencies in the site with respect to success criteria. However, it is important that the amount of cost liability for failure risk imposed on any particular venture reflect realistic failure probabilities and repair costs for that case. Factors to be considered in estimating failure probability and repair cost for any particular mitigation phase include various site-specific factors (e.g., location in the watershed, mitigation method employed) as well as the stringency of venture rules which establish quality controls. In the extreme, bank circumstances and the rules it must follow might be so stringent and favorable for mitigation success that financial assurance or other liability rules become unnecessary. A number of options are available to regulators for ensuring that ventures face cost liability for non-performance with contract requirements. These include surety bonds and equivalent financial assurance mechanisms.

Cost Accounting and Credit Pricing: The definition of commercial cost will differ by type of venture and by the judgement of the venture managers. While it may not be possible to assure common accounting practices across ventures, the cost accounting practices employed by public credit ventures should not escape regulatory oversight. Of course, this does not mean that public ventures should always set prices as high as comparable private ventures in the same area. Due to particular circumstances, a public credit venture may realize certain efficiencies or lower failure risk costs. For example, some ventures might enjoy cost advantages due to the use of public lands for credit production which entail little or no opportunity cost. If this were the case, then such advantages would justify accepting lower credit prices.

Cost Estimation: Because public entities do not face the same competitive pressures and constraints as the private sector, they are more likely to miscalculate costs. Also, unlike the case for private ventures, inaccurate cost accounting and credit pricing by public credit suppliers could have serious consequences for ecological success if the prices for credits are inadequate to cover restoration costs charged, or if reserves to repair failed sites are inadequate. Consequently, it may be desirable for public credit ventures to employ

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term management is specified according to the expected duration of loss.

careful cost accounting and auditing procedures and to provide financial assurance against possible mitigation failure.

Financial Objective: Not all ventures can be expected to pursue the same financial objectives. If a public venture is limited to a break-even goal, then they will drive the market price (at least for initial credits) down to their commercial cost of production. This price may not be adequate to support private ventures. If the public venture adopts a cost-plus or net revenue maximizing objective, then the surplus over costs might be used to help *finance* a broader plan to restore a watershed. Given that funding for watershed restoration plans is commonly a problem, this financial objective for government commercial credit ventures may be attractive.

Factors Influencing the Demand for Credits

Market Type: The potential market demand for commercially produced mitigation credits is derived from the demand for wetland discharge permits, the granting of which is often conditional upon compensatory mitigation. The Federal Section 404 permit program, as well as many state and local programs, requires mitigation for wetland fill permits that are issued. Different types of permits, mandating different mitigation requirements, can be issued within any one regulatory program. For example, the Section 404 permit program issues "general" permits for certain classes of wetland fills which are deemed to present minimal adverse effects (individually or cumulatively), as well as "individual" permits for development activities that entail more significant wetland impacts. Somewhat different mitigation requirements are specified for these two permit classes.

The existence of several different types of wetland discharge permits means that there are a number of potential sub-markets for compensatory mitigation that could be served through commercial credit ventures. The more of these sub-markets that regulators allow to be serviced by credit ventures, the greater would be the prospect for venture level success (by increasing the potential demand for credits at any one venture) as well as market level success (by increasing the possibility that multiple credit ventures could co-exist in some market area).

At least three potential sub-markets for commercial credits can be identified. One is individual 404 permits, which are subject to the "mitigation sequencing" rules as clarified by a 1990 Memorandum of Agreement (MOA) between the Department of the Army and the US EPA (US EPA and Army 1990). The mitigation sequencing rules require applicants for individual permits to first take all practicable steps to avoid and minimize wetland impacts at the discharge site. Once these steps have been taken, permit applicants are then required to provide compensatory mitigation for any remaining impacts. The 1990 MOA specifies a regulatory preference for on-site mitigation (adjacent or contiguous to the fill site) in the case of individual permits.

A second potential sub-market for commercial credits involves general 404 permits, particularly Nationwide Permit No. 26 (Nationwide 26) which authorizes activities involving the discharge of dredge or fill material into 10 acres or less of isolated waters or headwater streams. The mitigation sequencing rules (and thus the 1990 MOA) do not pertain to nationwide permits; they are instead governed by separate regulations promulgated in 1991. These rules state that for nationwide permits "...discharges of dredge or fill material must be minimized or avoided to the extent practicable at the project site, unless the District Engineer has approved a compensation mitigation plan for the specific regulated activity" (56 Fed. Reg. 59132; November 22, 1991). Thus, unlike the case for individual permits, a Nationwide 26 permit applicant may or may not be required to provide compensatory mitigation for residual impacts at the discharge site. In the case of nationwide permits, this decision is left to the judgement of the district regulator in consideration of the other measures that the permit applicant

proposes to take in order to minimize wetland impacts.

Unlike the 1990 MOA directives for individual permits, the nationwide permit rules do not state a preference for on-site mitigation. On the contrary, recognizing that on-site mitigation is often impractical or environmentally undesirable for relatively minor wetland fills, the rules state that "[t]o the extent appropriate, permittees should consider mitigation banking and other forms of mitigation, including contributions to wetland trust funds..." (56 Fed. Reg. 59132; November 22, 1991).

A third potential sub-market for commercial credits involves wetland impacts that fall outside 404 jurisdiction or mitigation requirements, but that must be compensated for under state or local permit programs. For example, Nationwide 26 permits involving less than one acre are exempt from mitigation requirements under the 404 program. But many states and counties have enacted laws and ordinances requiring no-net-loss of wetlands in their jurisdictions, and toward that end require their regulatory programs to secure compensatory mitigation for wetland impacts that are not subject to mitigation requirements under the 404 program. And because on-site mitigation is often impractical or infeasible for such minor wetland impacts, a number of such state and local permit programs allow applicants for permits involving minor impacts to satisfy their mitigation requirements through payment of a mitigation fee. As will be discussed in the next chapter, some state and local permit programs use collected fee revenues to produce off-site mitigation in large blocks. Other state and county permit programs collect and hold mitigation fees in trust for the intended future provision of mitigation through the development of public ventures, or the purchase of credits from private credit ventures once they become established in these jurisdictions.

As the above discussion suggests, Federal, state and local permit programs presently view permits involving relatively minor wetland impacts as the primary market for commercially produced mitigation credits. These include the two sub-markets associated with general 404 permits that carry mitigation requirements as well as wetland impacts not covered by, or that escape mitigation requirements under, the 404 program. Indeed, many of the operating credit ventures surveyed for this study indicate that they view their primary market as involving Nationwide 26 and other permits involving relatively minor wetlands impacts.

The recent emergence of commercial credit ventures to serve these sub-markets suggests that these types of relatively minor permit impacts are common enough to support commercial credit trading in many areas of the country. It should be recognized, however, that limiting credit ventures to minor wetland impacts would cap the potential demand for credits in any market area, thus limiting the scope for venture level and market level mitigation success.

Service Area: Another factor that bears on the potential demand for commercial credits involves the allowable geographical service (sales) area for credit ventures. Based on ecological factors, regulators generally feel that credit ventures should be located as close as possible to the permitted wetland impacts they serve. As with restrictions on the types of permit impacts served, limiting the service area for credit sales would limit the demand for credits from any one credit supplier, and reduce the prospect that numerous suppliers could compete for business in the same market area. This, in turn, would reduce the prospect for venture level and market level mitigation success.

One approach to reconciling these ecological and economic considerations might be to avoid defining service areas for credit ventures too narrowly in advance. For example, general standards might be developed which provide for exceptions on a case-by-case basis when there is no other viable mitigation option or any compelling ecological basis for limiting the reach of credit sales. Further, general standards might define different service areas for different sub-markets.

For example, from both an ecological and economic perspective, it might make sense to define larger geographical service areas for very minor impacts such as those involving Nationwide 26 permits involving less than one acre.

Regulatory Consistency for All Mitigation Options: The 1990 MOA governing individual 404 permits specifies a regulatory preference for on-site mitigation based on the desire to retain wetland functions lost at the site affected by the fill activity. However, it is increasingly recognized that the opportunity to successfully replace certain important wetland functions, such as wildlife habitat and general life support, may often be improved by conducting mitigation away from the fill site. This suggests that if the regulatory preference for on-site mitigation is applied in an inflexible manner, opportunities to obtain more environmentally desirable mitigation for impacts to these wetland functions may be foregone. The Joint Memorandum to the Field from the Department of Army and Environmental Protection Agency (US EPA and US Department of the Army 1993) and the Federal Mitigation Banking Guidance (U.S. Government 1995b) indicate an increasing support for flexibility and use of "ecological" sense in making this determination.

As regulators gain more experience in spotting situations in which on-site mitigation is not the most environmentally desirable option, and if initial experiments with credit markets prove successful at replacing lost wetland functions, regulators might in the future give permit applicants more flexibility in the choice of mitigation options. This could increase the potential market demand for commercial credits, and with it the prospect for venture and market level mitigation success.

However, if permit applicants were given greater choice of mitigation options, their willingness to choose the credit market alternative might be limited if the regulatory process does not hold on-site (or other project-specific) mitigation to comparable standards as those applied to commercial credit ventures. This consistency issue involves two components–the level of quality controls imposed on compensatory mitigation, and the level of mitigation required.

Historically, the imposition and enforcement of quality controls for on-site mitigation has often been lax, due largely to limited resources available to regulators. Indeed, it is these institutional problems which in part have promoted interest in commercial credit markets. Holding venture mitigation to a higher level of quality controls may lessen the cost advantage typically characteristic of venture mitigation (versus individual on-site mitigation). Thus the "cheaper" option may be on-site, even though it may have a greater likelihood of failure. This would lessen the demand for credits, and with it the prospects for the widespread emergence and success of credit markets.

Similarly, if permit applicants were required to provide a greater level of mitigation if their mitigation was provided by the credit market alternative versus the on-site option, this could also limit the demand for commercial credits. In principle, the mitigation replacement plan for any permit applicant should be determined by regulators based only on what is required to fully compensate for the unavoidable wetland impacts of the permitted discharge (i.e., independent of how the permittee chose to provide it). However, as will be discussed in the next chapter, some state regulatory programs by design appear to create a double standard with respect to mitigation requirements provided through commercial credit ventures.

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CHAPTER THREE. REVIEW AND EVALUATION OF COMMERCIAL CREDIT VENTURES

This chapter provides (1) an overview of the approximately 30 operating and prospective commercial credit ventures surveyed for this study in 1994[9] and (2) an evaluation of the subset of those ventures that were in operation at that time. The overview of credit ventures is structured around a taxonomy of venture types. The evaluation of operating ventures focuses on the quality control and other provisions of their respective operating agreements, as well as the actual experience to date with these ventures. These factors are evaluated against the conditions necessary for venture-level mitigation success developed in Chapter 2.

It should be noted that the history of commercial credit trading is limited, with the first such venture, the Millhaven (WET, Inc.) Bank in Georgia, permitted by the Corps in December 1992 (IWR 1994a). Public commercial ventures, two of which were constructed in the 1980s, have a longer operating history (Brumbaugh 1995).

The credit ventures reviewed in this chapter were surveyed in summer 1994. In July 1995, IWR conducted a more extensive survey of commercial ventures, which indicated that the status and form of some of the ventures have changed since this report was prepared. A report presenting the 1995 survey findings is in preparation.

Commercial Credit Ventures: A Taxonomy

Commercial credit ventures generally have been grouped into two broad types: commercial mitigation banks and in-lieu fee systems. Commercial banks have been defined as large-scale, off-site mitigation ventures in which credits 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 direct provision of compensatory mitigation on-site or at a single user mitigation bank. Fee revenues are accumulated in a dedicated fund that is intended to be spent at some future date for large-scale wetlands replacement (Apogee Research 1993, IWR 1994a).

Commercial mitigation banks are often assumed to be synonymous with the few so-called "entrepreneurial" banks that have been established in recent years by profit-oriented private sector firms. In practice, however, commercial ventures have been established or proposed by public as well as private (including not-for-profit) entities, and as joint efforts between the public and private sector. Similarly, fee systems are often assumed to be publicly sponsored since only regulators can authorize the payment of mitigation fees in lieu of the actual mitigation. However, in some fee systems, the required fee payments are made directly to private entities who satisfy the mitigation requirements of permittees according to standards imposed by regulators.

In effect, the classification discussed above distinguishes commercial banks from fee systems according to the time when the replacement wetlands are created relative to the time at which the wetland losses are permitted and credits are sold (fees charged). But the timing of replacement activities assumes that "advanced mitigation"can be precisely defined. To some, advanced mitigation means the provision of fully functioning wetlands before credit sales are allowed, or perhaps before a permit is issued. But very few (if any) of the many off-site mitigation systems, including "single-user" mitigation banks, have met this standard (IWR 1994a). In practice, there is substantial variation in the timing of mitigation

[9] Many reference documents were reviewed and people interviewed for this study. See Appendix A for a list of reference documents examined. See Appendix B for a list of those interviewed.

work (as well as the maturation of replacement wetlands provided) relative to the time at which credits are sold or fill permits issued. More importantly for this report and the National Wetland Mitigation Banking Study, a classification or understanding based on mitigation timing does little to illustrate the range of institutional and operating characteristics of commercial credit ventures, or facilitate evaluation of their possible effect on venture and market level mitigation success.

This report adopts a taxonomy for commercial credit ventures that contributes to a better understanding of venture and market level success (see Table 1). It uses two variables as classifiers: (1) financial objective, and (2) source of commercial capital. Generally, the former refers to the economic goals of credit ventures and the latter describes the origins of the resources (cash and physical inputs) used to initiate and maintain credit production.

Financial Objective as a Classifier

The financial objective classifier relates to how credit ventures price credits relative to their accounting definition of commercial cost of production (Chapter 2 includes an extended discussion of commercial cost). Commercial costs may not be defined in the same way across commercial ventures. And a supplier need not charge the same price to all credit purchasers. Price can be set in terms of market conditions and the demanders' circumstances (alternative sources for mitigation) at the time of sale. Indeed, some ventures may subsidize some credit sales by setting price below cost, and then recover this subsidy by charging other customers credit prices that include a premium over commercial cost.

Table 1 shows three possible financial objectives of credit ventures: maximize return, cost-plus, and break-even. A venture whose financial objective is to maximize return will price credits so as to maximize the difference between total sales revenue and commercial cost of production. A venture that adopts a cost-plus financial objective will price credits so as to generate a "small" profit over commercial cost, usually established as a percent of total cost. This excess over cost may be justified as insurance against cost estimation errors if the venture has a break-even financial goal, or if the venture wishes to earn revenues from the sale of credits that might be applied to other public purposes. For example, a venture may earn a small financial surplus to be dedicated to watershed restoration activities in a broader context. Such a cost-plus objective has precedent in some governments, for example, when water and sewer charges are used to finance other local services.

A venture that seeks to break-even will price credits so that the sales revenue will just equal commercial production cost. Many government entities are prohibited by law from seeking profits and so would accept prices only equal to costs. Other reasons for a break-even objective may be to lower the cost barriers to economic development by assuring that mitigation costs are no greater than absolutely necessary to achieve no-net-loss.

Source of Commercial Capital as a Classifier

The production inputs of land, management, equipment, and other inputs are used to produce mitigation credits. To be defined as commercial capital, these production inputs must be owned by the venture or need to be purchased. The "source of commercial capital" as used here identifies whether the owned inputs or the funds to purchase inputs are from private sector sources, public funds, or fees collected for issued permits.

Table 1 shows four possible sources of commercial capital for credit production: private sector resources (equity or borrowing), public sector resources (general government tax receipts or borrowing), dedicated mitigation fee revenue, and some combination of sources. The private and public capital source category identifies those ventures that are funded only with private and government resources, respectively. These ventures then recoup commercial costs from credit sales revenue. An important feature of these ventures is that they make some commitment of

resources prior to initial credit sales. However, this does not necessarily mean that replacement wetlands are actually constructed before credits are debited (sold) for permitted wetland impacts.

The mitigation fee revenue source category identifies those ventures in which all of the commercial resources used to capitalize credit production come entirely from mitigation fees paid by permittees. Ventures capitalized entirely by mitigation fee revenues necessarily do not involve any up-front commitment of commercial capital, and thus mitigation work. Since by definition those ventures whose commercial capital comes entirely from mitigation fee revenues do not provide replacement wetlands prior to the collection of fees, they are synonymous with the so-called in-lieu fee systems. To simplify discussion, these are referred to as "fee systems" in the remainder of this report.

Finally, credit production can be paid for by some combination of capital sources. The last source category provides no information on the timing of mitigation work relative to credit sales. Ventures that rely on a combination of capital sources may or may not involve the up-front commitment of commercial resources for mitigation work.

Summary Review of Commercial Credit Ventures

Operating Ventures

Possible types of commercial credit ventures, classified by source of commercial capital and financial objective, are identified in Table 1. The table identifies 12 possible types of credit ventures. Four of these types are represented among the population of 15 operating ventures surveyed for this study in the summer of 1994. These operating ventures, grouped according to the source of capital classifier, are reviewed briefly below.

Ventures Capitalized with Private Resources: The ventures supported exclusively with private resources represent "entrepreneurial" credit suppliers.[10] Two cells of the matrix identify such private, for-profit ventures, but only the first cell—which identifies those which seek to maximize net return on investment—is represented by ventures in operation as of 1994. These include Millhaven (GA), Pembroke Pines (FL), St. Charles (IL), Neabsco (VA), and Delta (LA, MS).

The Millhaven venture, like Pembroke Pines and St. Charles, is sponsored by a private firm that hopes to eventually establish a chain of credit ventures within its regional base. Millhaven's sponsor indicated in an interview that maximizing net return was not the primary goal for Millhaven, which represents the firm's prototype credit venture. But since the overall credit supply efforts of this firm (i.e., including anticipated future ventures) are geared toward that end, Millhaven is classified as having a maximize net return financial objective.

Millhaven received a Corps permit in December 1992, Pembroke Pines in July 1993, and St. Charles in 1994. The operating instruments for each of these three ventures stipulate that they may serve any type of 404 permit impact (subject to approval by the relevant Corps district on a permit-by-permit basis). However, the sponsors and Corps overseers of the Millhaven and St. Charles ventures indicated in interviews that the primary market for these ventures is general permit impacts, particularly Nationwide Permit No. 26.

[10] A number of private or semi-private "single-user" mitigation banks around the country have sold mitigation credits which remained after the respective sponsor's own mitigation needs had already been met. These include Fina LaTerre (LA) which is sponsored by the Tenneco Corporation, and the "Aliso Creek Wildlife Habitat Enhancement Project" (CA) which is jointly sponsored by the Mission Viejo Company and Orange County. These and similar ventures, which were not established entirely or primarily to produce mitigation credits for commercial sale, were not evaluated in this study.

TABLE 1. Types of Commercial Credit Ventures
With examples of operating (bold type) and prospective ventures, Summer 1994

Financial Objective	Source of Commercial Capital			
	Private Capital	**Public Capital**	**Mitigation Fee Revenue**	**Combination**
MAXIMIZE NET RETURN (i.e., maximize difference between revenue and commercial cost)	**Pembroke Pines (FL)** **St. Charles (IL)** **Millhaven (GA)** **Delta (LA, MS)** **Neabsco (VA)** Katy Wildlife (TX)			Volusia Co. (FL)
COST PLUS (i.e., recover something over commercial cost)	Wadsworth (IL) Friendswood (TX)	Harris Co. (TX)		St. Johns WMD (FL)
BREAK-EVEN (i.e., recover commercial cost)	Galveston Bay Foundation (TX)	**Astoria (OR)** **Bracut Marsh (CA)** Orange/Osceola Counties (FL) Juneau (AK) Logan City (UT) Lake Co. (IL) W. Eugene (OR)	**Pine Flatwood (LA)** **DuPage Co. (IL)** **Sacramento Co. (CA)** **Placer Co. (CA)** **Vicksburg Corps District** **Dade Co. (FL)** **MD Non-Tidal Fund**	**Ohio Wetland Foundation** S. Florida WMD Hackensack (NJ)

A MOA for the Neabsco venture was signed by the Norfolk Corps district in 1994. The MOA indicates that the venture will focus on servicing Nationwide permit impacts. As of the summer 1994, the Neabsco venture was not technically in operation because it had yet to receive final authorization from the state of Virginia. This is required since the Nationwide permit impacts that Neabsco will service must satisfy state 401 water quality certifications.

Delta, which received its Federal banking permit in 1994, is somewhat different than the other identified operating entrepreneurial ventures. Each of the other ventures are sponsored by for-profit companies, and are located at a single mitigation site. By contrast, Delta is sponsored by the "Delta Land Trust" (the "Trust"), a private, not-for-profit (for tax purposes) conservation organization dedicated to restoring and conserving wetlands and bottomland hardwood forests in the Mississippi River delta region. For the Delta credit venture, the Trust plans to establish many separate mitigation sites on privately owned, agricultural lands throughout the region.

The Trust will operate Delta by obtaining perpetual conservation easements on privately owned, prior-converted and farmed wetlands and ensuring that these lands are restored to wetland status. The Trust plans to assume restoration responsibilities and serve as the credit supplier for some Delta sites, while at other sites these tasks will be the responsibility of the private landowner under the Trust's oversight. Credit prices will be set by the credit supplier—either the Trust or the landowner—for each site. Presumably, those private landowners acting as credit suppliers will seek to maximize net return on investment. And the Trust indicates that it will price credits at whatever the market will bear in order to generate funds for its ongoing and future wetland restoration and conservation efforts.

<u>Ventures Capitalized with Public Sources</u>: Two of the listed credit ventures—Bracut Marsh (CA) and Astoria (OR)—were funded exclusively with public funds (see: Shabman et al. 1994, IWR 1994a, 1994b). These ventures seek to recoup all of their defined commercial costs of production through credit sales (break-even financial objective). Unlike the private ventures discussed above, these public ventures were established in part to provide mitigation for the wetland impacts associated with specific public development projects, as well as credits for general sale to other public and private applicants for state and individual 404 permits. Bracut Marsh was established by the California Coastal Commission in part to provide credits for the City of Eureka. Similarly, Astoria was established by the Oregon Division of State Lands in part to provide credits for the Port of Astoria (IWR 1994b).

The mitigation sites of these two ventures are very small relative to those associated with the private ventures. The total land area for Astoria is 33 acres and that for Bracut Marsh is 13 acres, of which only six are wetlands. By contrast, the only private venture that has a mitigation site less than 100 acres is St. Charles (at 48 acres).

<u>Ventures Capitalized with Mitigation Fee Revenue</u>: In 1992, IWR identified several ventures funded exclusively with mitigation fees charged to permittees (see Apogee 1993, IWR 1994a, 1994b). These and other fee systems are shown in Table 1. All have a "break-even" financial goal. The Maryland Non-Tidal Wetland Compensation Fund, however, subsidizes the mitigation needs of certain permittees and recovers the subsidy by charging other permittees fees that include a premium over commercial cost.

Although the seven ventures listed in Table 1 are financed in the same manner and all seek the same overall financial outcome, they actually represent a fairly diverse group. They vary according to a number of important factors, including regulatory program and type of wetland impacts served, and the way in which compensation is provided. Still, as reviewed below, a number of different characteristics are each shared by some subset of the larger group.

Two of these ventures—Dade County (FL) and Maryland—were established by these governments under general programmatic permit authority to administer the 404 program for certain wetland impacts. The government sponsors charge fees for these 404 impacts as well as for county and state permit impacts that fall outside Federal jurisdiction or mitigation requirements (e.g., Nationwide 26 impacts involving one acre or less). Both ventures have been operating for several years and the use of fee revenues to produce mitigation is ongoing.

Several ventures capitalized with fee revenues were established under county regulatory programs to obtain compensation for minor wetland impacts, such as Nationwide 26 impacts involving less than one acre, that would otherwise go unmitigated under Federal or state programs. These include ventures run by Sacramento County (CA), Placer County (CA), and DuPage County (IL). Each has been collecting mitigation fees for several years but, as of the summer of 1994, had not yet used fee revenues to provide replacement wetlands (although DuPage County had finalized mitigation plans and county officials indicate that they will soon begin work).[11]

The Sacramento and Placer systems were established to obtain compensatory mitigation in cases involving Federally permitted impacts in which mitigation is not required, and cases where the mitigation requirements imposed by Federal regulators would not achieve no-net-loss in wetland acreage. Essentially, these programs were established as interim measures to ensure the fulfillment of the counties' no-net-loss policies until county rules for commercial credit supply and use could be finalized, and private and public ventures became established. By 1992, Placer County had developed extensive draft guidelines for the establishment and use of commercial credit ventures that defined the conditions under which credits would be created and approved for sale. The Placer guidelines were never finalized, however, because the county authority to establish such guidelines appears to have been superseded by subsequent state legislation.[12]

Placer officials indicate that they have also shelved initial plans for county-sponsored ventures, and instead will use collected fee revenues to purchase equivalent credits from private ventures once they become established. Sacramento was working on plans in 1994 for using fee revenues to construct replacement wetlands. Officials from both counties indicate that they will stop collecting mitigation fees once private or public ventures become operational in their respective areas.

A number of ventures capitalized with fee revenues, due to the particular wetland circumstances in their areas, use fee revenues to manage (preserve) existing wetlands rather than to provide replacement wetlands. The logic is that even if the wetlands in these areas were protected from development impacts, without active management they would nevertheless degrade over time and their functions would be lost. Therefore, from a future perspective, the management effort is restoring what would otherwise be foregone. For example, the Pine Flatwood fee system serves permit impacts involving longleaf pine flatwood wetlands found in southeastern Louisiana which can survive only in large contiguous areas and require active fire maintenance to stay viable. The Pine Flatwood venture therefore uses fee revenues to purchase and manage large existing wetland tracts.

[11] The DuPage County venture was permitted by the Corps in October 1994.

[12] The "Sacramento-San Joaquin Valley Wetlands Mitigation Bank Act of 1993" makes the California Department of Fish and Game the lead agency for authorizing the establishment and use of credit ventures in the central valley, where Placer and Sacramento counties are located. The law says that local agencies may participate in these decisions, but cannot serve as the lead agency. Consequently, Placer county officials indicate that their draft guidelines for commercial credit supply and use will probably never be finalized.

Similarly, the Dade County, Florida system (East Bird Drive Basin) uses fee revenues for the ongoing control of exotic vegetation in the East Everglades. The general programmatic permit under which the Dade county fee program is operated was up for renewal in the summer of 1994 and the proposed new permit would make certain changes to the fee system. It would increase the geographic extent of impacts eligible as well as types of impacts covered. Since the eradication of invasive vegetation in the East Everglades is nearing completion, the county is proposing to use fee revenues for the restoration of a county park and other restoration efforts in the North Trail Basin part of the county. Plans for this new system are currently under development.

Finally, in several of the listed ventures capitalized with fee revenue, private, not-for-profit (for tax purposes) conservation groups or public resource agencies receive and apply fee charges to produce mitigation. For example, the Louisiana Nature Conservancy (LNC), along with the Corps New Orleans District and Louisiana state agencies, is a signatory to the operating agreement for the Pine Flatwood venture. The agreement provides that the Corps must first determine a permit applicant's eligibility to satisfy mitigation requirements through the venture. Once eligibility is established, the LNC determines the amount of the fee necessary to fulfill the permittee's mitigation requirement (as determined by Corps) and then collects it directly from the permittee.

Similarly, the Corps Vicksburg District allows certain 404 permits involving hydrocarbon exploration and other impacts to pay in-lieu mitigation fees. A qualifying permit applicant must first find a suitable publicly owned wetland parcel in need of reforestation, and a Corps-approved conservation entity who is willing to do the work. The permit applicant then pays a mitigation fee, based on its mitigation requirement as determined by Corps, directly to the conservation entity before the permit will be granted.

Ventures Capitalized with a Combination of Capital Resources: The last operating venture listed in Table 1—the Ohio Wetland Foundation (OWF)—is capitalized partly with private resources and partly with mitigation fee revenues. OWF is a private, not-for-profit (for tax purposes) entity established by the Ohio Homebuilders Association to provide credits for its members at commercial cost (i.e., break-even financial objective). The Association provided seed money for OWF's initial planning and mitigation efforts, but its subsequent mitigation work is funded primarily with mitigation fee revenues (see Apogee Research 1993).

Under an agreement with the Ohio Department of Natural Resources (DNR), OWF conducts mitigation efforts at various sites throughout Ohio on lands owned by DNR which are made available to OWF for mitigation sites at no cost. Many of the other operating ventures discussed in this chapter also rely on publicly owned lands for mitigation venture siting. These include private ventures which pay for the use of public lands; for example, the Pembroke Pines and St. Charles ventures each rely on municipal lands as venture sites which they pay for with profit-sharing arrangements, lease or licensing payments, or some combination.

OWF is classified differently than the other ventures listed in Table 1 because it is not capitalized exclusively with mitigation fee revenues, nor with private (or public) resources. The distinction drawn between the way in which OWF is capitalized and how some of the private ventures described earlier are financed is a subtle but important one. Like OWF, some of the ventures classified as being capitalized with private resources only (Pembroke Pines and St. Charles) rely on credit sales revenue to finance mitigation construction. Unlike OWF, however, those ventures commit private capital to post some type of performance bond prior to credit sales. This financial assurance is available to regulators in the event of non-compliance with permit conditions.

Prospective Ventures

A number of prospective (proposed or in planning as of summer 1994) credit ventures were also surveyed for this study. If eventually established, they would illustrate several more venture types not now represented by operating systems. It is hard to know precisely how to classify all of the prospective ventures according to the taxonomy developed here because many are still in the early planning stage. Still, an attempt is made to classify most of those surveyed for this study according to the Table 1 matrix. It should be recognized that this classification, and the description of prospective ventures that follows, is tentative and subject to change.

When prospective credit suppliers are added to the matrix they illustrate five additional venture types not now represented by operating ventures. For example, two prospective ventures—Wadsworth (IL) and Friendswood (TX)—are being established with private capital and will pursue a "cost-plus" financial objective. The former is being established by Wetland Research, Inc.,[13] a private, not-for-profit (for tax purposes) company that conducts wetland creation and restoration research projects. Credits from this venture will be priced somewhat above commercial cost in order to generate funds for the company's ongoing wetland research efforts. The Friendswood venture is sponsored by a private company in part to produce credits for its own development needs but also largely for general sale.

Another new venture type is represented by the planned Galveston Bay Foundation (TX) venture. It is being established by a private conservation group which will pursue a break-even financial goal. The proposed Harris County (TX) venture provides an example of another venture initiated with public capital, but one which alternatively plans to pursue a "cost-plus" financial objective.

The St. Johns River Water Management District (FL) and Volusia County (FL) ventures, both of which were in planning in summer 1994, illustrate two additional ventures types. These ventures will be initiated with a combination of capital sources. Both plan to use public resources to purchase mitigation sites, but the former will use mitigation fee revenues to capitalize credit production, and the latter will rely on its private (company) partner to capitalize the mitigation work. The St. Johns venture is still very early in the planning process, but preliminary indications are that it will pursue a "cost-plus" financial goal. The Volusia County venture, on the other hand, will try to maximize net return on investment, and toward that end will price credits at whatever the market will bear.

Other prospective suppliers appear to represent venture types already represented by at least one operating venture. For example, Katy Wildlife (TX), which is currently in planning and sponsored by Browning-Ferris Industries, represents a private, entrepreneurial venture. And several of the prospective credit producers listed in Table 1 represent public, break-even ventures, including Lake County (IL), which is in the early planning stages, and Logan City (UT), which anticipates that the municipal venture will subsidize the provision of credits (price below cost) for certain types of sought-after development, and offset this subsidy by charging other customers credit prices that more than cover production costs.

Another prospective public, break-even venture, Juneau (AK), is proposed as a part of a watershed-based wetlands resource planning initiative for the city. The West Eugene (OR) and Hackensack Meadowlands (NJ) ventures are also proposed as part of watershed plans. The Hackensack system may include several different venture types. The watershed plans of these localities, and the specific plans for credit ventures, are discussed in detail in Chapter 5.

[13] This venture was permitted by the Corps in April 1995.

Evaluation of Operating Ventures

The operating agreements and the actual experiences of the credit ventures in operation as of 1994 can be evaluated against the conditions necessary for mitigation success developed in Chapter 2. This evaluation provides clues regarding which of the several venture types may be at risk of falling short of this standard. The operating ventures listed in Table 1 are reviewed below in terms of the various supply and demand side factors that may affect venture level and market level mitigation success.

Supply and Cost Factors

Quality Controls:
Ventures capitalized with private resources: All of the existing private entrepreneurial ventures (Millhaven, Pembroke Pines, St. Charles, Neabsco, and Delta) include a full suite of quality controls mandated by regulators to ensure ecological success. These include (in addition to design and construction specifications) performance standards for replacement wetlands, monitoring and maintenance requirements, and provisions to ensure that mitigation sites are protected in perpetuity.

Importantly, the establishment of environmental safeguards for these ventures was done in a way that was sensitive to the economic viability of the private credit supply business and to the regulator's expectations for ecological success. For example, the authorizing instruments for three of the five operating ventures (Millhaven, Pembroke Pines, and St. Charles) allow for credit sales prior to the attainment of performance standards in return for provisions requiring these ventures to post financial assurances for the construction and success of replacement wetlands.

The permit for Millhaven states that when construction and planting is complete for a particular mitigation parcel according to Federal permit specifications and a "preliminary determination of hydrology" is made, the venture can then sell one-half of the total mitigation credits generated by that parcel. The venture must then show within three years that the parcel satisfies wetland delineation criteria relating to hydrology, soils, and vegetation before the remaining credits can be sold.

The contract provisions for St. Charles and Pembroke Pines illustrate even more flexible standards for the timing of credit use. The contract for St. Charles allows for the sale of 30 percent of credit capacity prior to wetland construction, an additional 20 percent when hydrology is established, and 20 percent more when planting is complete. The final 30 percent is available for sale following the second full growing season after construction if the site is trending toward success according to stated performance standards. These provisions reflect requirements imposed by the Corps Chicago District rules for commercial credit trading (which are discussed in the next chapter).

The permit for Pembroke Pines allows the venture to construct replacement wetlands in phases immediately following credit sales. In other words, when the venture sells credits to some permittee, it must then immediately begin construction on the replacement wetlands that will fulfill that permittee's mitigation requirement.

In return for the opportunity to engage in "early" credit sales (i.e., before replacement wetlands are constructed and/or meet specified performance standards), each of the ventures discussed above is required to post performance bonds or the equivalent to insure against non-compliance with permit conditions for the construction and success of replacement wetlands. These financial assurances can be released in stages according to the fulfillment of construction requirements and specified success criteria for replacement wetlands, but cannot be fully released until the successful completion of monitoring and maintenance periods. In each case, the determination of the dollar amount of financial assurances required was based on the regulator's estimate of repair cost for mitigation failure. In the case of Pembroke Pines and St. Charles, these estimates

were developed in part using cost information supplied by the venture sponsors.

The contracts for Neabsco and Delta are also sensitive to the economic viability of these ventures, but each approaches the issue differently than the ventures discussed above. Upon a cursory reading, the MOA for the Neabsco venture appears to severely limit the ability of this venture to survive economically. It states that credits cannot be withdrawn until the Corps District determines that replacement wetlands are established and functioning according to stated performance standards. In an interview, the Neabsco sponsor indicated that it agreed to this "advanced" mitigation requirement only after negotiating a separate contract provision that would enable the venture to generate cash flow before credits sales were made. This provision allows part of the venture site to be used to provide concurrent, off-site mitigation for permitted impacts, but such mitigations would not be considered part of the commercial credit venture. In other words, the Corps may allow certain permittees to satisfy their project-specific mitigation requirements by paying Neabsco to concurrently produce replacement wetlands at the venture site, but these wetlands would not be recorded as venture credits or debits. And, importantly, legal liability for the success of these replacement wetlands will remain with the permittees.

Since Neabsco credit sales will be based on established and functioning replacement wetlands, the venture is not required to post financial assurance. Similarly, the permit for Pembroke Pines includes a provision that waives the performance bonding requirement (for mitigations conducted concurrently with credit sales) in the case of credit sales based on established and functioning replacement wetlands.

The permit for Delta, by contrast, allows for early credit sales in order to preserve economic viability, but does not balance this allowance with requirements for financial assurance. It says that for each of the venture's mitigation sites, once the necessary easement has been secured and the restoration plan approved by the Corps, Delta may then sell up to 50 percent of the expected credit capacity at the site. As soon as any credit sales from the site are made, Delta then must, within the next planting season, fully implement the restoration plan for the entire site. (Each of Delta's mitigation sites must be at least 100 acres.) The remaining credits for the site can then be released for sale after three years if the Corps District determines that replacement wetlands meet success criteria established by the permit. These permit provisions for the timing of credit market-ability are similar to those included in the permits for St. Charles and Pembroke Pines. Unlike those ventures, however, Delta is not required to post financial assurance in return for the right to engage in early credit sales.

Several reasons were given by regulators why financial assurances were determined not to be necessary for ensuring the success of Delta wetland mitigations. One relates to the nature of the venture sponsor—the Delta Land Trust (the "Trust"). The Delta venture is part of a larger wetland restoration and conservation program run by the Trust which secures permanent easements on privately owned, prior-converted, and farmed wetlands in the region. The Trust then does planting to jump-start the restoration of these lands. Corps District officials point to the Trust's commitment to, and experience with, wetland conservation and restoration in the region as one reason it is confident that the Trust will fulfill the terms of the Delta permit. In addition, the Corps District stressed that if Delta failed to comply with permit requirements at any one of its mitigation sites, the Corps could prohibit all Delta sites from serving 404 permit impacts. The Corps District views this authority as providing a powerful incentive for Delta compliance.

Perhaps the most compelling reason given for why Delta is not required to provide financial assurance in return for the right to engage in early credit sales involves the nature of its mitigation sites, which are representative of former and degraded bottomland, hardwood wetlands found in

the region. Delta's mitigation sites will include only prior-converted and farmed wetlands for which the underlying hydrology and hydric soils are intact. These sites, once permanent easements are secured and farming activity ceases, would be expected to eventually revert naturally to vegetated wetlands even in the absence of active planting or other restoration measures.

This also explains why Delta is not required to provide a reserve fund dedicated to long-term management. The regulators with jurisdiction over the other operating entrepreneurial ventures also reason that reserve funds for long-term management are generally unnecessary for mitigation sites that have been designed and constructed to be self-maintaining. Thus, for example, if a hurricane or other natural event destroyed planted vegetation after the sites had already been restored to wetland status, wetland vegetation would be expected to naturally re-establish.

Based on this logic, only one of the operating entrepreneurial ventures—Pembroke Pines—is required to provide funding for long-term management. These funds are held by the city that owns the land on which the venture is located. Under the terms of the permit, the city is responsible for long-term management of the site once monitoring and maintenance periods are successfully completed for mitigation parcels. The city will use these funds to control site invasion by exotic vegetation, which is a major problem for wetlands in the area.

Ventures capitalized with public resources: In contrast to the experience with operating private ventures, the MOAs established for the two operating public commercial ventures—Bracut Marsh (CA) and Astoria (OR)—do not include many of the quality controls necessary for ensuring ecological success.[14] For example, Bracut is not held to monitoring or maintenance requirements tied to success criteria for replacement wetlands. And, while Astoria's MOA does require the venture to monitor and correct uncovered deficiencies, these responsibilities are not clearly established because the MOA does not include specific performance standards for replacement wetlands.

Most importantly, neither of these ventures were required to post financial assurances even though both were authorized to sell credits before replacement wetlands were demonstrated successful. Bracut sold credits prior to wetland construction, and Astoria was debited immediately following initial construction. The Astoria debit was for made for the Port of Astoria; but this did not actually involve a sale of credits because, by prior agreement, the Port already owned these credits in return for donating land to the venture.[15]

Both ventures initially fell well short of mitigation goals and required significant remedial action. Corps District regulators indicate that the problems with these ventures involved siting, design and construction flaws. The Astoria mitigation did not produce the requisite wetland types, which subsequent remedial work was unable to fix. The venture sponsor, the Oregon Division of State Lands, indicates that the venture site now is a functioning freshwater wetland (Ken Bierley, personal communication). However, because the venture did not provide the requisite wetland types, it is currently in suspended status. No debits have been made since the initial debiting for

[14] It should be noted that the MOAs for Bracut and Astoria were signed in 1980 and 1987 (amended in 1988),

(continued...)

[14](...continued)
respectively. These were among the first commercial credit ventures in the country. Descriptions of these ventures can be found in IWR Report 94-WMB-2 published as part the National Wetland Mitigation Banking Study (IWR 1994b).

[15] In both cases, early credit sales were not needed by the ventures for financial reasons. Rather, these ventures were established by public entities in large part for their own use, and pressure to allow early withdrawal came from the advancement of their own public works activities.

the Port, and Corps district regulators indicate that 404 permittees will not be allowed to utilize the venture to provide compensatory mitigation.

Bracut has undergone two phases of remedial activity. Its sponsor, the California Coastal Conservancy, indicates that the venture has now—more than ten years after initial construction—met original expectations for a self-maintaining brackish wetland. As of 1994, approximately 71 percent of the available credits had been used and at least one proposed use was pending.

Given the lack of contract requirements for financial assurances at these ventures, it is fortunate that the respective sponsors made the expenditures necessary to correct site problems. This illustrates how, in the absence of contract provisions to require financial assurance or other types of reserve funding, mitigation success may depend largely on the good faith of venture sponsors to correct unforeseen problems.

But the purpose of financial assurances goes beyond ensuring that funds will be available to correct mitigation deficiencies. Requiring venture sponsors to post financial assurances provides a powerful incentive for ventures to carefully site, plan, and execute the construction of replacement wetlands.

Ventures capitalized with mitigation fee revenue: In principle, credit ventures that are capitalized exclusively with mitigation fee revenues should adhere to the same quality control standards as other commercial credit ventures, including financial reserves for mitigation repair. However, several such ventures were developed for special circumstances which may lessen the need to meet such a standard. For example, the Sacramento and Placer county ventures were established as interim programs until private or public ventures became established in these areas. These counties charge fees for wetland impacts that would not otherwise be subject to compensatory mitigation requirements under Federal or state regulatory programs. Fee revenues have been placed in trust accounts dedicated to the future purchase or construction of replacement wetlands, but plans for their disposition have not yet been finalized. Thus, quality controls for the provision of replacement wetlands have not yet been developed.

The other operating ventures which are capitalized exclusively with fee revenues are all associated with operating agreements which establish the conditions under which revenues are used to provide replacement wetlands. These contract provisions can be evaluated against the types of quality controls necessary for venture level mitigation success.

The DuPage County venture (IL), like those of Sacramento and Placer counties, was originally established to obtain compensation for small wetland impacts that otherwise would go unmitigated under Federal regulations. Although DuPage was yet to apply fee revenues in summer 1994, it was finalizing plans for two mitigation sites (Winfield[16] and Cricket Creeks) and construction was expected to begin in fall 1995.

The county has applied to the Corps for general programmatic permit authority to administer the 404 program and has developed mitigation plans for the Cricket Creek site in accordance with the new Chicago Corps District rules for commercial credit supply and use (which are discussed in the next chapter). The draft operating agreements include performance standards establishing numerical standards for the presence, coverage and abundance of vegetation, as well as provisions for intensive monitoring and maintenance for the first five years after construction, and for long-term operation and management over the following 15 years. These include scheduled and unscheduled maintenance activities such as water level manipulation, prescribed burning, protection of vegetation, and the control of invasive species.

[16] The Winfield Creek venture was permitted by the Corps in October 1994.

Two operating ventures that are capitalized with mitigation fee revenue—Vicksburg Corps District and the "Maryland Non-Tidal Wetland Compensation Fund"—maintain that they apply the same general quality controls standards to their mitigation efforts as those applied to on-site mitigation projects in their respective areas. Vicksburg allows general permit impacts involving hydrocarbon exploration, and certain individual permit impacts on a case-by-case basis to use the fee option when no other mitigation alternative is practicable. The Vicksburg District first determines each permit applicant's mitigation requirement. If the permit applicant can secure a public entity who desires restoration on wetlands it owns, as well as a Vicksburg District-approved conservation entity who is willing to do the work, Vicksburg District may allow the permit applicant to satisfy the mitigation requirements in this way. The Vicksburg District applies success criteria and monitoring requirements before approving mitigation plans and issuing permits. The fee payment is made directly to the conservation entity doing the mitigation work, which then proceeds concurrently with permit impacts. The system includes no provisions or funding for the long-term management or corrective actions at mitigation sites.

The Maryland system is a more formal arrangement in which permits involving relatively minor wetland impacts are allowed to contribute mitigation fees into a fund controlled and used by the state regulatory agency to provide replacement wetlands. The program has been ongoing for several years and various mitigation sites have been constructed, with several in progress and in planning at any point in time. These mitigation efforts are subject to the same requirements as the state regulatory program imposes on-site mitigation, including prescribed trading ratios and monitoring provisions. Since the system is run under general programmatic permit authority, its mitigation efforts are not technically subject to Corps oversight. Even so, the state took remedial action on the first mitigation project conducted using fee revenues when the Corps complained that the site was too dry to meet wetland delineation criteria. The money for corrective actions came directly from the Fund; the state system includes no separate reserve fund for corrective actions or long-term management.

Two ventures capitalized with fee revenue—Pine Flatwood (LA) and Dade County (FL)—commit fee revenues to the prevention of degradation of existing wetlands (i.e., preservation) rather than to the provision of replacement wetlands. These ventures, therefore, have somewhat different types of quality control provisions. The Pine Flatwood system relies on the Louisiana Nature Conservancy (LNC) to use fee revenues for the purchase and active management of longleaf pine wetlands. The venture MOA requires the LNC to purchase and maintain these wetlands according to best management practices for this wetland type, including prescribed fire maintenance, and control of shallow water hydrology to maintain soil moisture. However, because the ecological dynamics of these wetlands are not well understood, the MOA does not specify particular success criteria that must be met. It does, however, require LNC to alter its management activities as necessary to maintain these sites as functioning wetlands. The MOA says that an interagency team will monitor the sites every five years, and make recommendations for management changes as needed.

Similarly, the Dade County venture (East Bird Drive Basin) relies on the National Park Service (NPS) to use fee revenues for the control of invasive exotic vegetation in the East Everglades (Apogee 1993, IWR 1994b). In essence, fees charged for permitted wetland impacts are used to manage equivalent wetland acreage on public lands. Successive MOAs between the county and the NPS set out the responsibilities of each party, including the allowable uses of fee revenues and the progression of enhancement activities for the control of melaleuca trees on specific parcels of the park.

Ventures capitalized with a combination of capital sources: The operating agreement for the Ohio Wetland Foundation (OWF) says that the relevant

Corps district must first approve OWF mitigation sites and design and construction plans. Once approved, permit applicants can propose to the Corps use of an OWF site to fulfill their mitigation requirement. Upon approval by the Corps, the permit applicant must pay the Ohio Department of Natural Resources (DNR) a mitigation fee sufficient to implement their mitigation requirement. The Corps determines the mitigation requirement of some permittees, while OWF determines the amount the permittee must pay to fulfill it. When one-half of the projected credit capacity for a site has been sold in the manner described above, DNR then channels the fee revenue to OWF who then begins construction. A 3 to 4 year monitoring period applies to each site. While there are no formal success criteria for replacement wetlands, the operating agreement requires OWF to perform needed maintenance as determined by DNR during the course of the monitoring period.

OWF's operating agreement requires the venture to contribute a fixed dollar amount per acre of replacement wetlands to DNR to fund DNR responsibilities for long-term monitoring and maintenance of sites (once OWF's monitoring period for each site has been successfully completed). OWF also contributes a fixed sum of money per acre of replacement wetland into a contingency fund, which OWF officials characterize as a good faith effort on their part to show DNR that OWF will take responsibility for necessary corrective actions.

Regulatory Treatment of Different Venture Types: The above review of operating credit ventures suggests that those developed and capitalized wholly or in part by the private sector have, as a group, been held to more stringent quality control requirements than other venture types. Most significantly, while almost all of the surveyed ventures (regardless of type) are allowed to sell credits before the construction and/or the demonstrated success of replacement wetlands, only in the case of private ventures is this allowance typically balanced with provisions requiring financial assurances. Ventures capitalized with public capital or exclusively by mitigation fee revenues typically are not required to provide financial assurances or maintain a reserve fund to insure that replacement wetlands are actually constructed and meet specified performance standards (i.e., success criteria). Indeed, the operating agreements for some of these ventures do not even specify performance standards for replacement wetlands.

Cost Accounting and Credit Pricing: The production costs relevant to the sponsor of a credit venture will determine the level of credit prices necessary to meet the venture's financial objective. As discussed in Chapter 2, these "commercial" costs are not necessarily compara-ble across venture types. In addition, the nature and level of some venture's relevant commercial costs will be affected by the specific quality con-trols imposed on the venture by regulators, which, as discussed above, can vary considerably across different venture types as well as particular ventures.

Private (entrepreneurial) ventures would be expected to define a greater number of commercial cost items than public ventures. For example, a public venture may not include the venture manager's salary as a commercial cost if it is paid for through general tax revenues.[17] But, in a private venture, the manager's salary would represent a true opportunity cost and thus would be considered a commercial cost of the venture. Also, as the above review of the surveyed ventures illustrates, private ventures are typically required to post financial assurances, the cost of which would be included in the venture's cost accounts and reflected in its credit pricing structure. The public ventures reviewed for this study are not held to comparable financial assurance requirements, and, thus, do not define and measure assurance costs for the pricing of credits.

[17] See: IWR Report 94-WMB-2 for a description of costs included in fees for selected in-lieu fee schemes (IWR, 1994b).

Regardless of how a venture defines its commercial costs and how it is affected by venture quality controls imposed by regulators, the venture must fully account for these costs in the prices it charges for credits if it is to meet its financial objective. Private ventures would be expected to carefully account for all relevant commercial costs in the pricing of credits. The sponsors of the privately capitalized ventures indicate that the costs of all inputs used in the production of credits, as affected by quality controls, are counted as commercial costs and factored into the prices for credits charged by these ventures. These commercial costs include all cash outlays and opportunity costs including those costs associated with financial assurance requirements (e.g., performance bonds).

Accurate cost accounting and credit pricing is much more likely to be a problem in public ventures. The experience to date with public ventures, although limited, appears to support this conclusion. For example, the significant remedial actions necessary at both Astoria and Bracut Marsh greatly increased overall production costs for these ventures. But since neither venture was required to post performance bonds or maintain reserve accounts to cover contingencies, the unplanned expenditures made for corrective actions were not part of the cost structures for these ventures, and thus were not factored into the prices charged for credits.

In addition, other venture activities which were not anticipated and thus not considered commercial costs for the pricing of credits have proved problematic and costly to these ventures. For example, the sponsors of Bracut Marsh and Astoria indicate that monitoring costs were not considered part of the commercial cost structures for these ventures. In the case of Bracut Marsh, the venture sponsor expected that the replacement wetlands would be self-maintaining, making monitoring unnecessary. This did not prove to the case, however. Similarly, Astoria expected that monitoring costs would be funded by the state "mitigation banking revolving fund," but the fund was never capitalized. The result was that both ventures made significant unplanned expenditures for site monitoring.

The problems at Bracut Marsh and Astoria resulting from the lack of consideration of remedial and monitoring costs for credit pricing were accentuated by the break-even financial goal of these ventures, which left little room for cost accounting error. This has proved particularly problematic for Bracut Marsh since its operating agreement prescribes fixed credit prices during the life of the venture. Consequently, Bracut Marsh's sponsor (the California Coastal Conservancy) estimates that when all available credits have been sold it will have recouped only 54 percent of total venture costs.

The potential for miscalculating costs may be even more likely in the case of ventures capitalized exclusively with mitigation fee revenues, since they can involve significant lag times between when fees are charged and when replacement wetlands are constructed. The now defunct mitigation system run by the city of San Diego in the early to mid-1980s for small vernal pool impacts illustrates this problem. Fee charges proved insufficient to fully cover land and construction costs for replacement wetlands (and mitigation proved less than successful). This possibility also caused one municipality to shelve initial plans for a commercial venture capitalized with fee revenues—the proposed mitigation fee component of the Special Area Management Plan for Mill Creek, Washington, was dropped because of uncertainty about restoration costs and the sufficiency of collected fee revenues.

The operating ventures that are capitalized exclusively with mitigation fee revenues are reviewed briefly below in terms of the commercial costs included in their cost accounting structures and reflected in the fees they charge. The available information is too limited to permit an evaluation of the accuracy with which these ventures have been able to account for and recover commercial costs through fees charges, however. Indeed, several of these ventures have not yet even

realized any costs since they have not as yet planned or conducted any mitigation work.

The interim mitigation fee ventures run by Sacramento and Placer counties in California provide two examples of such ventures that as of summer 1994 had yet to use collected fees to secure replacement wetlands. Each of these county programs, which were established to collect fees for small permit impacts only until private or public ventures became operational in these areas, base fee charges on rough estimates of the costs of restoring vernal pools in these areas.

Placer relied on a rough estimate of construction and management (but not land) costs provided by the California Department of Fish & Game to calculate per acre fees. Placer officials were hopeful that once private ventures emerge in the area, the county would be able to purchase credits at no more than the county per acre fee, even if this was below what the private venture would normally charge for credits. The county hopes to work out a deal whereby if a private venture agreed to provide equivalent credits at that price for disposition of collected fees, the county would commit to buy its own future mitigation needs through that venture.

Similarly, Sacramento county reviewed the amount of past restoration costs in the area to which an estimate of land costs was added to arrive at a per acre fee. Planning for the disposition of fee revenues was in progress as of summer 1994, and county officials were hopeful that collected fee revenues would be sufficient to cover the full commercial costs of implementing the required mitigation.

Like these two California counties, DuPage county (IL) had been collecting mitigation fees for minor wetland impacts but had yet to use these funds to produce mitigation as of 1994. In this case, however, fee charges are based on established mitigation plans that estimate the component and total commercial costs of producing replacement wetlands. These include cost estimates for administration, plan development, the design and construction of replacement wetlands, monitoring and active maintenance of wetlands for the first five years after construction, and long-term management over the following 15 years. Public land is being provided for the venture at no cost to the county, and is, therefore, not treated as a commercial cost of the venture, and is not reflected in fee charges.

The fees that the Vicksburg District allows permit applicants to pay directly to not-for-profit conservation groups (who apply the fees on a case-by-case basis) are based on seedling and labor costs for reforesting bottomland hardwood wetlands. For general permit impacts involving hydrocarbon exploration, a standard fee per acre of impact is charged. Vicksburg District officials indicate that the fee is a mid-range estimate; some projects may involve somewhat higher costs and others somewhat lower costs. Land costs are not included in fee amounts since, in order to use the fee option, a permittee must first find a public entity willing to allow the mitigation work to proceed on lands they own. Many public agencies in the Vicksburg region have come into possession of degraded wetlands through farm foreclosures and loan defaults which they eagerly offer for restoration with fee revenues. Thus, land costs are not considered a commercial cost of the venture, and are not reflected in fee charges.

The two ventures that apply fee revenues for the management of existing wetlands (Dade County and Pine Flatwood) base fee charges on the cost of these activities as determined by the entities who perform the work. Fees charged by Dade County are based on the estimated cost of activities required for the eradication of exotic vegetation on equivalent acreage in the Everglades National Park, as determined by the National Park Service (NPS). These commercial costs include component costs for helicopter use, materials, and labor. Since the mitigation wetlands are publicly owned, no charge for land costs is included in the fee charge.

The fees charged by the Pine Flatwood venture are based on the costs of purchasing longleaf pine

wetlands and managing them for 50 years, as determined by the Louisiana Nature Conservancy (LNC). A standard per acre fee is charged which includes land acquisition costs, administrative costs, and the costs of monitoring and actively managing the wetlands for 50 years. The LNC maintains that all input requirements for the venture are included as commercial costs, and that any unforeseen problems would simply require an adjustment of management activities, which would not impose any additional costs beyond that which is already budgeted and included in fee charges.

Lastly, the Maryland Non-Tidal Wetland Compensation Fund sets mitigation fees according to a formula that includes land acquisition costs (which vary by county) as well as design, construction, and monitoring costs. Estimates of land costs were derived from the average appraisal value for land in each county. The estimates for mitigation costs were based on data on wetland restorations costs developed by state agencies and wetland consulting firms. Maryland officials indicate that they track actual costs and now have a more realistic notion of design, construction, and monitoring costs. As of the summer of 1994, Maryland planned to amend the fee structure to reflect this information. Administrative costs of managing the program and long term management and contingency costs are not included in fee amounts, however.

The Maryland system subsidizes certain minor wetland impacts by providing mitigation for these impacts without charging the fee. Maryland officials maintain that this subsidy is then recovered by charging other permit applicants mitigation fees which reflect something over the actual costs of producing required mitigation. This is accomplished through the use of, whenever possible, public or private lands for which the state does not have to pay.

The above review shows that there is significant variation in the items included as commercial costs for the purpose of fee setting across ventures capitalized exclusively with mitigation fee revenue. For example, many, but not all, of these ventures do not include component costs for land or administration in fee charges. None of the surveyed ventures appear to include a premium in fee charges to reflect the costs of unforeseen contingencies (although this may not be a relevant consideration for ventures such as Dade County and Pine Flatwood which actively manage existing wetlands rather than provide replacement wetlands).

Demand and Price Factors in Operating Ventures

Market Type: The operating agreements for each of the surveyed private ventures, as well as the one venture which is capitalized in part with private resources, appear to place no restrictions on the type of permit impacts these ventures may serve, beyond specifying that regulators will have the final say on all proposed trades. The interviews with regulators and venture sponsors conducted for this study suggest that many of the private ventures were developed under the assumption that their primary markets would be relatively small-scale impacts authorized by general 404 permits, specifically Nationwide 26 permits. However, the operating agreements for most of these ventures explicitly state that they can service individual 404 permit impacts, subject to Corps determination that the mitigation sequencing rules have been met and that the credit ventures represent the best practicable mitigation alternative.

In contrast to these private ventures, the two surveyed ventures capitalized with public capital (Astoria and Bracut Marsh), which are both relatively very small operations, were established to serve specific wetland impacts. For example, Astoria (OR) is authorized to service individual 404 and state permit impacts involving unavoidable impacts to estuarine wetlands that are "necessary under the local comprehensive plan." Astoria's MOA further specifies that the venture can be used only when on-site mitigation is not an available option or can only partially fulfill the permittee's mitigation requirement. Similarly, Bracut Marsh may serve individual 404 and state permit impacts involving only "pocket marshes" in

the city of Eureka and estuarine wetland fills in Humboldt Bay.

Not surprisingly, the surveyed ventures that are capitalized exclusively with mitigation fee revenues are limited to specific types of wetland impacts. For example, the ventures of Sacramento, Placer, and DuPage counties were each established to secure compensatory mitigation for Nationwide 26 permits involving less than one acre that are exempt from mitigation requirements under the 404 program. Other ventures, including those run by the state of Maryland and Dade County, were established to provide mitigation for certain wetland impacts covered under general programmatic permit authority. The other surveyed ventures were each developed specifically to serve either impacts to certain limited wetland types, or impacts involving specific development activities. The operating agreements for the ventures allowed to serve certain individual 404 permits stipulate that they can be used in such cases only after the mitigation sequencing rules have been met, and on-site mitigation opportunities have been exhausted.

Service Area: As is the case for market type, the operating agreements for the surveyed private ventures do not seem to place severe restrictions on allowable service areas. These private ventures are either not restricted to narrow service areas, or are allowed to serve impacts outside narrowly defined areas as deemed appropriate by regulators on a case-by-case basis. For example, the specified service areas for the St. Charles, Millhaven, and Delta ventures each encompass broad regional watershed areas. Further, the operating agreement for St. Charles also allows this venture to service impacts outside its defined service area, but subjects such trades to higher trading ratios. While the operating agreement for the Pembroke Pines venture defines its service area as the "general vicinity, preferably within the same watershed," it says only that impacts within this area will receive "priority consideration," thereby providing the flexibility to allow for outside-watershed trades. Similarly, Neabsco's operating agreement specifies its service area as the eastern part of the county in which the venture is located, but allows for deviations subject to Corps approval. The operating agreement for the Ohio Wetland Foundation, which anticipates creating various mitigation sites throughout the state, states that OWF should select sites in the general regions where development activities are expected to occur.

The service areas defined for the two public ventures are much more limited than those defined for the surveyed private ventures. This is not surprising given the small-scale nature of these ventures. Bracut Marsh is limited to serving the city of Eureka and Humboldt Bay, and Astoria's service area encompasses an eight-mile radius within a single watershed.

For the most part, the geographical service areas for ventures capitalized exclusively with mitigation fees are defined as county-wide. For example, county-wide service areas are defined for the ventures of Sacramento, Placer, DuPage, and Dade counties. The Maryland venture requires mitigation sites to be in the same county as the wetland impacts they serve. Similarly, the Pine Flatwood venture focuses on impacts and mitigation within St. Tammany Parish in Louisiana.

Regulatory Consistency for All Mitigation Options: As a general rule, historical on-site mitigation standards have been less stringent than those imposed on the private credit ventures surveyed for this report. For example, on-site mitigation efforts are typically allowed to proceed concurrently with permit impacts. However, permittees typically have not been required to post financial assurances for mitigation success. Such requirements are similar to the quality controls imposed on some, but not all, of the surveyed ventures that are capitalized with public resources or with mitigation fees exclusively.

However, the on-site mitigation standards in the jurisdictions in which the credit ventures surveyed for this study are located were not all reviewed. Those that were reviewed include the regulatory

jurisdictions in which area-wide rules for commercial credit market have been developed, which encompass several of the operating ventures surveyed for this study. The regulatory requirements imposed on on-site mitigation efforts in these jurisdictions are reviewed in the next chapter.

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CHAPTER FOUR. REVIEW AND EVALUATION OF REGIONAL (AREA-WIDE) GUIDANCE AND RULES FOR COMMERCIAL CREDIT TRADING

This chapter provides an overview and evaluation of regional guidance and rules for commercial credit trading which have been developed in several localities. The evaluation focuses on how the various provisions of these market structure rules might affect the supply of, and demand for, credits from commercial ventures. They are evaluated against the conditions necessary for venture- and market-level mitigation success which were developed and discussed in Chapter 2.[18]

Overview of Market Structure Guidance and Rules

Several subsets of the operating and prospective credit ventures reviewed in the previous chapter include ventures that are located in the same region and that may eventually operate competitively [together] in the same market area. These areas include, northeast Illinois, southeast Texas, and a number of Florida regions. However, a market in which two or more ventures compete for the business of the same general set of permit applicants has not yet developed as of summer 1994. But a number of different areas of the country, including the three mentioned above, have developed Federal, state, or local rules for commercial credit trading which provide a regulatory framework for the operation of credit markets in these areas.

Generally, these area-wide rules and guidance were developed to facilitate the emergence of credit markets by providing information on the responsibilities of credit ventures and the steps required for regulatory authorization of commercial credit sales. The available evidence suggests that having such rules established in advance may be necessary for the timely establishment of commercial credit ventures, particularly private ventures. Indeed, without such advance rules, the regulatory uncertainty may be so great that the willingness to invest in credit production is dampened. As evidence, all but one of the operating entrepreneurial ventures were developed in the absence of explicit guidance and experienced a lengthy planning and approval process (largely because of disagreements between regulatory and resource agencies on various venture provisions). By contrast, the St. Charles venture received a Federal permit soon after rules for commercial credit trading were finalized in its area of operation.

Two approaches to setting market structure rules were reviewed in the summer of 1994 as part of this study. One approach represents state rules promulgated pursuant to legislative directives for commercial credit trading. Minnesota, Maryland, and Florida have promulgated such regulations. The Florida rules, which were promulgated by the state Department of Environmental Protection (DEP) as well as each of the several Water Management Districts in the state (which serve as a regulatory arm of DEP), govern several of the prospective credit ventures listed in Table 1.

The second approach represents Federal regulatory guidelines for the establishment and use of commercial credit ventures in specific Corps districts. Two sets of Corps district guidelines were identified for this study.[19] The guidance for the Corps Chicago District, which was developed jointly by Federal regulatory and resource agencies, affect a number of operating and prospective credit ventures listed in Table 1, including St. Charles, Wadsworth, DuPage County,

[18] See Appendix A for a list of reference documents examined, and Appendix B for a list of persons interviewed in connection with these area-wide rules.

[19] As noted earlier, Federal guidance has since been published (28 November 1995; Federal Register Document 95-29023).

and Lake County. Similarly, the guidance established for the Corps Galveston District, which was developed jointly by state as well as Federal regulatory and resource agencies, includes under its jurisdiction the proposed and planned credit ventures of Harris County, Friendswood, Browning-Ferris Industries (Katy Wildlife), and Galveston Bay Foundation.

The area-wide rules all establish very similar requirements for the application and approval of commercial credit ventures. In general, a venture application in any of these jurisdictions requires a detailed delineation and assessment of the site and surrounding areas; a detailed mitigation plan that outlines the components and schedule of activities relating to the design and construction, monitoring and maintenance, and long-term management of replacement wetlands; and, a description of how the venture will improve the ecological value of the site and surrounding areas. Venture applications must also show that the venture sponsor has sufficient legal or equitable interest in the venture property, and that venture replacement wetlands will be protected in perpetuity through the conveyance of a perpetual conservation easement or some similar mechanism.

The area-wide rules also include a set of provisions which set forth the conditions and standards under which credits generated by regulator-approved ventures can be certified for sale. Once regulators conceptually approve a commercial credit venture, these general provisions are used to establish venture-specific requirements for credit generation and sale which are written into the operating agreement for the venture. These provisions are discussed further below. The Corps district area-wide guidance is expected to be modified to incorporate the new Federal guidance.

Evaluation of Market Structure Guidance and Rules

The area-wide rules are evaluated below in terms of their influence on the supply and demand for mitigation credits. Important provisions of the area-wide rules are summarized in Tables 2 and 3, respectively.

Supply and Cost Factors

Quality Controls: The area-wide rules generally provide for the type of balancing of quality controls necessary to provide adequate environmental safeguards while preserving the economic viability of commercial credit supply (see Table 2). For example, the Florida rules and Corps Chicago District guidance each allow approved ventures to sell a limited amount of credit capacity before the construction of replacement wetlands, provided that these ventures post financial assurances in addition to adhering to other quality controls. The Chicago District rules allow approved credit ventures to sell up to 30 percent of credit capacity prior to wetland construction. The Florida rules do not specify exactly how much of credit capacity that a permitted credit venture will be allowed to sell prior to wetland construction, but preliminary indications suggest that it will be no more than 10 percent. Under both sets of rules, remaining credits can be released for sale in stages as various performance standards are met.

The Maryland rules provide somewhat less flexibility regarding the timing of credit sales relative to the construction and success of replacement wetlands. They allow for the sale of up to 50 percent of credit capacity from an approved credit venture following the construction of replacement wetlands. The remaining credit capacity can be released for sale after two full growing seasons have passed following construction provided that no remediation was required and interim performance standards have been met. The Maryland rules, like the Florida rules and Corps Chicago District guidance, require credit ventures to post financial assurances in return for the right to sell some portion of credit capacity before the demonstrated success of replacement wetlands.

The financial assurances required by the three area-wide rules discussed above can be returned

to credit ventures in stages as progress toward performance standards is demonstrated. In each of these area-wide frameworks, the rules specifying the dollar amount of financial assurance required in any case focuses on the total costs of achieving each mitigation phase rather than the expected cost of remedial action for that phase, taking into consideration the probability and cost of failure. Such a standard might be necessary at least until regulators gain more experience in gauging failure risk and repair cost associated with venture mitigations.

Not all of the area-wide rules allow for credit sales before the construction and/or demonstrated success of replacement wetlands, however. Both the Corps Galveston District guidelines[20] and the Minnesota state rules require replacement wetlands to be constructed and deemed functional prior to credit sales, but do not require ventures to post financial assurances.

The Minnesota rules establish a state-wide credit supply system in which individual "account holders" can create credits for deposit in the system, which they can then sell to third parties. "Local Government Units" (LGUs) oversee the activities of account holders in their respective areas and approve credit deposits and sales. The LGUs themselves can also create credits for deposit and sale. The Minnesota rules stipulate that replacement wetlands must be constructed and demonstrated successful prior to credit sales (minimum of six months for restored wetland), and no financial assurance is required.

This "advanced" mitigation requirement imposed may not seriously limit private commercial credit production in Minnesota due to the particular mitigation opportunities the state offers. Minnesota has large amounts of prior converted and farmed wetlands, including many former Prairie Pothole wetlands, which can often be restored to functioning wetlands relatively easily and inexpensively (e.g., by simply removing drainage tiles). The economics of commercial credit production in this state may therefore be favorable despite the requirement that replacement wetlands be constructed and have evident wetland characteristics before credit sales are allowed.

The Minnesota rules do provide some limited flexibility on the timing issue through a provision for "cash banking" which allows LGUs to sell credits prior to the construction of replacement wetlands. Since an LGU that engages in cash banking will be held liable for any failure to produce successful replacement wetlands, the rules provide that an LGU that engages in cash banking can require a credit buyer to post a cash securities or its equivalent with the LGU in an amount equal to the estimated costs of constructing the credit buyer's mitigation requirement (in addition to paying the credit price set by the LGU). The security provides assurance to the LGU that the price charged for credits will be sufficient to cover the full costs of constructing replacement wetlands. Regarding the cash banking provision, the fact sheet for the Minnesota rules says: "This option is recommended only when direct replacement is not available or weather conditions, for example, prohibit prior replacement, and will likely only be necessary through 1994 or until banking credits become available."

The Corps Galveston District guidelines were not developed specifically to address commercial credit trading. Rather, the rules focus on single-user mitigation banking, although they do say that "[t]ransfer of mitigation credits to a third party is permissible if it is included in the specific bank MOA and follows the procedure stated in the MOA." Given the rules' lack of specific attention to commercial credit trading, it is not surprising that they provide no flexibility concerning the timing of credit use relative to wetland construction and success. The rules require venture wetlands to be in place and judged successful before credits can be certified for use (or transfer), and no financial assurance is required. In an interview, District regulators

[20] It should be noted that any Corps District guidance is expected to be consistent with the recently released Federal guidance.

indicated that in 1993 when the guidance was drafted they did not anticipate the potential widespread emergence of commercial credit trading; consequently, the guidance as written did not reflect the special needs of commercial credit ventures.

Despite the Corps Galveston District guidelines' seeming inattention to the economic viability of commercial credit ventures, four of the surveyed prospective credit ventures were located within this jurisdiction and were being developed in conformance with the rules. However, two of these (Harris County and Friendswood) were being established to serve the anticipated mitigation needs of their sponsors as well as for credit sales to other permit applicants. Since the commercial part of these ventures probably entails relatively little additional financial commitment, the advanced mitigation requirement for these ventures may not be a limiting factor for commercial operations. Additionally, the development of a third proposed venture in the Galveston District (Katy Wildlife) appears to be motivated in large part by the public relations value of restoring a degraded ecosystem. The venture sponsor, Browning-Ferris Industries, is a member of the "Wildlife Habitat Council" which certifies private companies that engage in environmentally responsible behavior. The value of this certification appears to be one reason the company is moving ahead with the project even though it will require significant up-front capital expenditures.

The inflexibility of the Galveston guidelines with respect to the timing of credit marketability is proving problematic for another proposed venture in the District, however. Its sponsor, the Galveston Bay Foundation (GBF), was given a tract of land that they deemed well suited for producing mitigation credits. However, GBF did not have the money to do the mitigation work in advance of credit sales. Corps regulators acknowledged that this proposed venture illustrates that the rules as they now stand may hinder the development of commercial credit supply in the Galveston District.

Regulatory Treatment of Different Venture Types: Apart from the Corps Galveston District guidelines, the area-wide rules surveyed for this study focus specifically on credit sales and are generally attentive to the special needs of commercial credit ventures. While they generally appear to preserve the economic viability of commercial credit supply, some hold private ventures to higher standards of performance than public ventures, which could provide public ventures with an artificial cost advantage. For example, the Florida rules do not require ventures developed by the state Department of Environmental Protection, the state Water Management Districts, to post financial assurance as a necessary condition for early credit sales, but private ventures, as well as local government ventures, must provide such assurances. Further, the rules require as a condition for receiving venture permits that private entities must have a "legal or equitable interest" in the property which is to be used for the venture. But state-sponsored ventures need only to have identified potential venture sites "to be acquired" as a condition for receiving permits.

These provisions may reflect the state's desire to get commercial credit trading started in a timely fashion. The rules explicitly "encouraged" each water management district to establish at least two mitigation ventures in their respective areas by January 1, 1995. Whatever their motivation, however, these provisions provide an artificial cost advantage for state-sponsored credit ventures over local government and private ventures. It thus raises the possibility that private and local government ventures may not be able to compete in the same market area with state ventures.

The Maryland rules also appear to create a double standard for private credit ventures with respect to financial assurance requirements. Ventures developed by local governments or private entities may be permitted to sell some portion of credit capacity before the success of replacement wetlands is demonstrated, but only private ventures are required to post financial assurances. Local government ventures are instead required to

demonstrate in some other manner the capacity to address contingencies.

Cost Accounting and Credit Pricing: As the above discussion indicates, each of the area-wide rules require commercial credit ventures to adhere to certain quality controls as a condition for commercial operations. These quality controls will affect each credit venture's cost of producing credits, and, thus, the level of credit prices necessary to meet the venture's financial objective. But the area-wide rules generally do not establish rules or guidance specifying the types of production costs that should be relevant to the credit pricing structure of some venture, nor the methods that should be used by ventures to account for production costs in the price-setting process.

One would expect that such guidance is not necessary for private ventures; in this case the area-wide rules need only be concerned with ensuring the ecological success of venture replacement wetlands. But since the way in which public ventures define and account for production costs in its credit pricing structure may affect the prospects for both venture level and market level success, this may be a relevant issue for the area-wide rules to address if the relevant entities wish to encourage private sector investment. For example, if some public credit venture failed to fully account for and reflect all of its defined commercial costs of production in the setting of credit prices, this would lead to "below-cost" pricing. In addition to subsidizing the mitigation requirements of credit buyers, this would be in-compatible with venture-level mitigation success because it could threaten the ecological success as well as the financial solvency of the public venture. This situation also would be incompat-ible with market-level mitigation success because it could place private ventures at a competitive disadvantage, and, thus, lessen the chance that several credit ventures could co-exist in the same market area.

In general, the area-wide rules seemed not to have recognized or anticipated this potential obstacle to venture- and market-level mitigation success. Cost accounting and credit pricing issues are not addressed at all by the Chicago and Galveston Corps District guidelines nor the Maryland state rules.[21]

The Florida rules do include a provision that addresses cost accounting and credit pricing by state ventures (i.e., those developed by the Department of Environmental Protection or any of five Water Management Districts) but only by way of establishing a ceiling on the credit prices they can charge. It provides that: "The cost per mitigation credit from a Department (District) bank shall be set by the Department (District), but shall not exceed the higher of:

1. The estimated cost, at the time of final permit processing, of creating one acre of wetland on the project site, including the fair market value established by independent appraisal, of lands at or abutting the project site to be used for mitigation, and construction, operation, monitoring, and management costs; or

2. The Department's (District's) estimated cost per credit for acquisition, design, construction, operation, monitoring, and management of the mitigation bank."

The first item refers to the cost of providing on-site mitigation for some permit impact. The second item refers to the cost of providing equivalent credits by a state credit venture, and its wording implies that state ventures must consider all land and production costs in the price setting process. But this provision establishes a ceiling rather than a floor for credit prices at state ventures. That is, it does not say that state ventures must price credits so as to ensure that all commercial production costs are fully reflected in credit prices.

[21] The new Federal guidance also does not address these issues.

At any rate, amendments proposed in August 1994 to the rules promulgated by the Department of Environmental Protection (DEP) would eliminate this provision. If adopted, the rules as amended would make no reference to cost accounting and credit pricing by state (or local government) credit supply ventures. The separate rules proposed by each of the Water Management Districts (WMDs) in the state, as originally written, were virtually the same as the rules promulgated by DEP. However, it is not clear whether all of the various WMDs follow DEP's lead in adopting or rejecting this proposed change to the DEP rules.

The Minnesota rules, on the other hand, do appear to recognize a need for government credit ventures to carefully account for production costs in the pricing of credits. The Minnesota rules say that all public resources devoted to public credit ventures must be fully costed and reflected in the prices they charge for credits. The fact sheet for the rules includes the following explanation:

> "If a local government uses its property, funding, staff time for design and monitoring, etc. to complete a wetland restoration or creation project and gain banking credits, it must factor those items into the price it charges for the sale of wetland credits. This means that when constructing wetlands for banking on public land, the value of the land rights and public contributions need to be factored into the sale price of credits."

Demand and Price Factors

Market Type: The area-wide rules generally do not restrict the commercial credit option to specific types of wetland discharge permits (see Table 3). The Minnesota rules provide one limited exception by restricting the commercial credit option to state permits involving wetland impacts of less than five acres if these impacts occur in counties that have less than 80% of pre-settlement wetlands remaining. The Corps Chicago District guidance also anticipate that commercial credit ventures will be used primarily to serve permits that affect "relatively small acreage of low value wetlands." The Chicago District guidance stipulate that: "Typically, these will be projects which, with mitigation, are currently authorized under Nationwide Permit No. 26." But the Corps Chicago District guidance, like those of the Corps Galveston District, do not explicitly restrict individual 404 permitees from using the commercial credit market option.

The Florida rules allow any state permittee, and the Maryland rules allow any state permittee that produces non-tidal wetland impacts, to use the credit market option provided that the mitigation sequencing rules are first met. The Minnesota rules also allow any permittee in counties having more than 80% of pre-settlement wetlands to use the credit market option subject to the satisfaction of mitigation sequencing rules. Each of these states have well-developed wetland permit programs, and state and Federal 404 permit applications are typically processed simultaneously. In cases such as these in which the state permit program is at least as stringent as the federal 404 program, if a permittee's mitigation plan satisfies state regulators, it typically (but not necessarily) will also satisfy Federal regulators. Thus, the flexibility on the types of state permittees that may use the commercial credit option under the Florida, Maryland, and Minnesota rules may translate into concomitant flexibility with regards to Federal 404 permittees in these jurisdictions.

It is important to note that each of the Federal and state area-wide guidance and rules require permittees to first satisfy the mitigation sequencing rules before they will be allowed to use the commercial credit market option. This adherence to the mitigation sequencing rules includes the regulatory preference for on-site mitigation. Under each of the area-wide rules, a permittee will be allowed to provide their required compensatory mitigation through purchases from commercial credit ventures only when regulators determine that on-site mitigation is not practicable or would produce less ecological value.

Service Area: Most of the area-wide rules also appear to provide the necessary flexibility with

respect to venture service areas by not specifying narrowly defined service areas and by allowing for certain deviations from specified service areas. For example, the Chicago Corps District guidance defines service areas as one of five regional watersheds, and also allow for certain outside-watershed trades subject to higher trading ratios. Similarly, the Minnesota and Maryland rules define service areas as county-wide or within major watersheds, and also allow for certain exceptions. The Galveston Corps District guidelines specify service areas as watersheds or major hydrological basins, but do not provide explicit explanation of these terms.

The Florida rules, however, may create a problem for credit ventures by its narrowly defined service areas. The Florida rules define service area as "regional watershed or aquatic preserve," with certain exceptions that are subject to higher trading ratios. While this language suggests service areas could be quite large, interviews with state officials indicate that some of the state Water Management Districts (of which there are five) may encompass more than fifty different regional watersheds as the term might be interpreted under the rules. This suggests that many service areas in the state could be quite small, which could greatly restrict the demand for credits from any one credit venture unless overall wetland development activity within these watersheds is substantial.

Regulatory Consistency for All Mitigation Options: Each of the area-wide rules impose quality control standards on commercial credit ventures that are more stringent, to varying degrees, than those applied to on-site mitigation projects in these jurisdictions (see Table 3). For example, each of the individual quality controls imposed by the Corps Chicago and Galveston District guidelines for commercial credit ventures appear to be higher than those applied to on-site mitigation. Indeed, the preamble to the Corps Chicago Districts guidelines for commercial credit trading explicitly says that: "Mitigation banks generally shall be held to higher standards of performance than conventional wetland mitigation sites."

Perhaps the most visible difference in quality control requirements for the two mitigation options in these Corps Districts involves provisions for mitigation timing and financial assurance. The Galveston District guidelines require venture replacement wetlands to be constructed and certified successful before credits generated by the site can be used. On-site mitigation in this district is typically allowed to proceed concurrently with the permitted activity. The Chicago District guidance does allow approved credit ventures to sell some limited portion of credit capacity before replacement wetlands are constructed, which is comparable to the concurrent mitigation requirement imposed on on-site mitigation projects in this jurisdiction. However, commercial credit ventures will be allowed to engage in such "early" credit sales only if they post financial assurances. Financial assurances are not required in the case of on-site mitigation.

The quality controls imposed by the three state rules for commercial credit trading also appear to be comparable to those applied to the on-site mitigation option in these areas, except for provisions regarding mitigation timing and financial assurance. The Minnesota rules require commercial credit ventures to construct and demonstrate the "success" of replacement wetlands before credits sales are allowed, but on-site mitigation is allowed to proceed concurrently with permitted impacts. Similarly, the Maryland rules allow approved credit ventures to sell some portion of credit capacity after mitigation construction only if financial assurance is posted by the venture. By contrast, as long as on-site mitigation is completed concurrently with the permitted wetland project, this mitigation option is not subject to financial assurance requirements.

The Florida rules also apply this type of double standard to commercial credit ventures, but only with respect to those developed by private entities or local governments. The rules for the timing of credit sales and financial assurances that pertain to state-sponsored credit ventures are comparable to those applied to on-site mitigation. However, Florida generally does not require permittees to

post financial assurance for on-site mitigation projects.

In terms of mitigation requirements, only the Maryland rules for commercial credit trading appear to create a double standard for commercial credit ventures (see Table 3). Trading ratios for on-site mitigation in the state are set according to fixed formulas that vary according to the type of wetland impacted by the permitted activity. But the Maryland rules for commercial credit trading stipulate that commercial trades will be subject to trading ratios that are 50 percent greater than those required for on-site mitigation.

TABLE 2. Area-Wide Rules for Commercial Credit Trading: Supply Side Provisions†

1. FLORIDA		
Area-wide Rule		State rules issued by the state Department of Environmental Protection (DEP) as well as the several state Water Management Districts (1994). The Water Management Districts (WMDs) issue permits for local government, private, and DEP credit ventures in their respective areas. The DEP issues permits to WMD credit ventures. Amendments to the DEP rules proposed in fall 1994.
Quality Control Standards	**Acceptable Mitigation/ Performance, Monitoring & Maintenance**	Wetland restoration, creation, enhancement, and preservation (including uplands) are all acceptable methods for producing replacement wetlands. Success criteria and monitoring and maintenance standards for replacement wetlands required. Determined case-by-case in the venture permitting process.
	Long-term Site Protection & Management	Perpetual conservation easement for venture sites must be conveyed to the state agency and relevant water management district (WMD), or fee interest conveyed to the state agency. Private credit ventures must provide up-front trust funds for long-term management. Local government ventures must also provide trust funds for long-term management, but these can be funded as credits are withdrawn, provided that trust funds are fully funded by the time all credits have been withdrawn. State agency and WMD credit ventures are exempt from trust fund requirements for long-term management.
	Timing of Credit Marketability/Financial Assurance	Permitted private or local government ventures will be able to sell some limited portion of credit capacity before construction of replacement wetlands only if financial assurance is posted equal to the cost of constructing and implementing mitigation phases, which can be released when the construction and implementation for the mitigation phase is complete and trending toward success. Financial assurance not required when construction is complete for some phase and success is demonstrated prior to credit sales. (No credit is available for the creation of freshwater wetlands until success is demonstrated.) Permitted DEP and WMD credit ventures may sell credits before wetland construction (or even before selection of venture sites) with no financial assurance requirements.
Cost Accounting/Credit Pricing		The rules as originally promulgated establish the types of costs that must be considered for credit pricing at DEP and WMD ventures by way of a provision that establishes a ceiling on the credit prices charged by these ventures as no more than: 1) "the estimated cost per credit of acquisition, design, construction, operation, monitoring, and management for the mitigation bank; and, 2) the cost of creating one wetland acre at the site of a permitted project proposing to use the state venture, including fair market land value, construction, operation, monitoring and management costs." A proposed amendment to the DEP rules would eliminate this decision rule (it is unclear whether any or all of the WMDs would change their rules accordingly).

† Provisions as of Summer 1994.

TABLE 2. Area-Wide Rules for Commercial Credit Trading: Supply Side Provisions† (Continued)

2. MARYLAND		
Area-wide Rule		State Department of Natural Resources (DNR) regulations (1994). DNR would issue venture agreements to local government and private credit ventures.
Quality Control Standards	**Acceptable Mitigation/ Performance, Monitoring & Maintenance**	Restoration of former and degraded wetlands, and wetland creation using suitable uplands are acceptable methods for producing replacement wetlands. Wetland enhancement may be allowed on a case by case basis. Required success criteria for replacement wetlands include: 1) Sufficiency of hydrology to sustain non-tidal wetlands 2) Interim standard of 45% plant coverage 3) Final standard of 85% plant coverage within the monitoring period 4) Evidence that wetlands are providing or will provide non-tidal wetland functions. Five year monitoring and maintenance period for replacement wetlands is required.
	Long-term Site Protection & Management	Mechanism required to assure site protection in perpetuity.
	Timing of Credit Marketability/Financial Assurance	State-approved ventures may sell up to fifty percent of credit capacity when: 1) As-built plans showing completed site construction, preparation, and contouring have been submitted to the state agency, and 2) Surety bonds or equivalent are posted by the venture in an amount equal to the fee structure established by the MD Non-Tidal Wetland Compensation Fund. No more than one-half of expected total replacement wetland acreage can be the basis for credit sales before two full growing seasons have passed following construction. The remaining credits can be released for sale after two full growing seasons if remediation has not been required and the interim success criteria have been met. Financial assurance remains in force until the completion of the monitoring period or the last credit is withdrawn, whichever is later, but can be partially released within the monitoring period. Local government ventures are not required to post financial assurance; they must instead demonstrate, in some other manner, the ability to perform needed corrective actions.
Cost Accounting/Credit Pricing		The rules do not discuss cost accounting or credit pricing issues.

† Provisions as of Summer 1994.

TABLE 2. Area-Wide Rules for Commercial Credit Trading: Supply Side Provisions† (Continued)

3. MINNESOTA		
Area-wide Rule		State regulations (1993) establishing a state-wide credit trading system. "Local Government Units" (LGUs) approve credit deposits and sales by private "account holders;" LGUs also can create credits for deposit and sale.
Quality Control Standards	**Acceptable Mitigation/ Performance, Monitoring & Maintenance**	Restoration of degraded wetlands can be used to produce replacement wetlands. Wetland creation is acceptable only in counties which have 80% or more of pre-settlement wetlands. Success criteria for replacement wetlands relating to hydrology, substrate, and vegetation required; determined case by case for each mitigation site. Account holders as well as the Local Government Unit (LGU) having jurisdiction over accounts are responsible for monitoring credit deposits located in their areas for a five year period. LGUs can order account holders to undertake corrective actions as needed. A state board will inspect each site at least once every five years and can order corrective actions.
	Long-term Site Protection & Management	Deed covenants must be recorded for credit sites. Transfer of credits must be accompanied by transfer of fee title, easement or license. The holder of this claim is responsible for maintaining site wetland status in perpetuity.
	Timing of Credit Marketability/Financial Assurance	Replacement wetlands must be constructed before credits can be authorized for sale. For wetland restorations, at least six months must pass following construction before LGUs will determine acceptability and total amount of credits generated (for wetland creation, at least one year must pass). No financial assurance is required. LGUs may sell credits sales prior to wetland construction only if they have chosen a mitigation site, developed a replacement plan, and can estimate the amount and type of replacement wetlands that will be created. Since LGUs will be held responsible for the success of replacement wetlands that serve as the basis for early credit sales, LGUs can require the credit buyer to post financial assurance with the LGU equal to the cost of construction (in addition to the credit price charged).
Cost Accounting/Credit Pricing		The rules stipulate what cost accounts should be reflected in the prices charged for credits by LGU account holders. The fact sheet for the rules explains: "If an LGU uses its property, funding, staff time for design and monitoring, etc. to complete a wetland restoration or creation project and gain banking credits, it must factor those items into the price it charges for the sale of wetland credits. This means that when constructing wetlands for banking on public land, the value of the land rights and public contributions need to factored into the sale price of credits."

† Provisions as of Summer 1994.

TABLE 2. Area-Wide Rules for Commercial Credit Trading: Supply Side Provisions† (Continued)

4. CHICAGO CORPS DISTRICT		
Area-wide Rule		Interagency agreement between the USACE, USEPA, and USFWS (1994). The USACE issues permits or signatory agreements for public and private credit ventures. (NOTE: Federal guidance was published in November 1995.)
Quality Control Standards	**Acceptable Mitigation/ Performance, Monitoring & Maintenance**	Restoration of former wetlands and creation of new wetlands are emphasized and given full credit. Wetland enhancement and preservation may be acceptable on a case by case basis, but will be given only partial credit. Required success criteria for replacement wetlands include: 1) Native perennial species of wetland community represents 50% of species within 2 years of planting, and 80% within 5 years 2) Federal delineation criteria met 3) At least 75% of total plant cover is obligated of facultative wetland species 4) At lease 70% of species planted or seeded are alive. Five year monitoring and maintenance period required for replacement wetlands.
	Long-term Site Protection & Management	Permanent conservation easements with deed restrictions required. Escrow accounts or their equivalent required for funding monitoring and maintenance of replacement wetlands until all credits have been certified and sold or until the USACE determines that replacement wetlands are self-sustaining.
	Timing of Credit Marketability/Financial Assurance	Three types of credits recognized: 1) uncertified–available for sale prior to the construction of replacement wetlands (no more than 30% of total credit capacity) 2) conditionally certified–after second growing season following construction if trending toward success 3) certified–replacement wetlands have met all success criteria. When a credit venture's charter is approved, uncertified credits (no more than 30% of total credit capacity) are released for sale. Additional 20% of credits can be sold when hydrology is established, and another 20% when planting is complete. Final 30% available for sale upon conditional certification of credits. Uncertified credits must be backed with surety bonds or equivalent equal to the estimated cost of generating conditionally certified credits. Once achieved, surety bond amounts reduced to the estimated cost of generating certified credits.
Cost Accounting/Credit Pricing		Cost accounting and credit pricing issues are not addressed.

† Provisions as of Summer 1994.

TABLE 2. Area-Wide Rules for Commercial Credit Trading: Supply Side Provisions† (Continued)

5. GALVESTON CORPS DISTRICT		
Area-wide Rule		Interagency guidelines developed by the USACE, USEPA, and other federal and Texas resource agencies (1993). The USACE issues memoranda of agreement for public and private credit ventures. (NOTE: Federal guidance was published in November 1995.)
Quality Control Standards	**Acceptable Mitigation/ Performance, Monitoring & Maintenance**	Wetland restoration, enhancement, and creation are all acceptable methods for producing replacement wetlands. Wetland preservation allowed in exceptional cases only. Success criteria, as well as monitoring and maintenance required for replacement wetlands. Determined case by case for each venture.
	Long-term Site Protection & Management	Mechanisms required to ensure site protection in perpetuity. Trust funds required for future management only if the mitigation method employed requires active long-term management.
	Timing of Credit Marketability/Financial Assurance	Replacement wetlands must be constructed and meet success criteria prior to credit trades. The rules provide that the transfer of credits to "third parties" is permissible if provisions and procedures for credit sales are included in specific venture agreements. The rules do not otherwise specifically address credit sales.
Cost Accounting/Credit Pricing		The rules do not discuss cost accounting or credit pricing issues.

† Provisions as of Summer 1994.

TABLE 3. Area-Wide Rules for Commercial Credit Trading: Demand Side Provisions‡

1.FLORIDA		
Area-wide Rule		State rules issued by the state Department of Environmental Protection (DEP) as well as the several state Water Management Districts (1994). The Water Management Districts (WMDs) issue permits for local government, private, and DEP credit ventures in their respective areas. The DEP issues permits to WMD credit ventures. Amendments to the DEP rules were proposed in fall 1994.
Market Type		The rule allows any state (dredge and fill) and WMD (surface water management) permittee, after sequencing requirements have been met, to use the credit option subject to the following conditions: "Use of a mitigation bank is appropriate, desirable, and a permittable mitigation option when the mitigation bank will offset the adverse effects of the project; and 1) on-site mitigation opportunities are not expected to have comparable long-term viability...and 2) use of the mitigation bank would provide greater improvement in ecological value than on-site mitigation."
Service Area		Mitigation service areas for each venture will be determined based on whether "...adverse impacts within the mitigation service area can be adequately offset by the mitigation bank." The proposed amendments to the DEP rules add that such service areas "...will typically be coextensive with the regional watershed in which the mitigation bank is located." The rules do allow for trading outside defined service areas in cases involving: 1) impacts of less than one-half acre 2) linear impacts involving infrastructure projects, and 3) impacts located partially within the service area.
Consistency with On-site Mitigation Standards	**Quality Controls**	The quality control standards for commercial credit ventures, as applied to local government and private ventures (see Table 2) appear to be more stringent than those typically applied to on-site mitigation projects. For example, a permittee who uses the on-site mitigation option is not required to provide trust funds for long-term management. Mitigation is allowed to proceed concurrently with permit impacts, and financial assurance is not required unless the estimated mitigation cost exceeds $25,000. However, the quality control standards for DEP, WMD, or local government credit ventures do not require trust funds for long term management or financial assurances for mitigation construction and success.
	Credit Requirements	Commercial credits defined as acres of wetland type. In-kind trades only. Trading ratios determined case by case for each permitted impact. Credit trades outside service area (except for linear impacts) subject to higher trading ratios. Case by case determination of credit requirements is also used for the on-site mitigation option. Nothing in the rules for commercial credit trading suggests that a permittee who uses this mitigation option would be subject to higher trading ratios than if the on-site mitigation option were instead used (all other factors equal).

‡Provisions as of Summer 1994.

TABLE 3. Area-Wide Rules for Commercial Credit Trading: Demand Side Provisions‡ (Continued)

2. MARYLAND		
Area-wide Rule		State Department of Natural Resource (DNR) regulations (1994). DNR would issue venture agreements to local government and private credit ventures.
Market Type		Any state permittee with non-tidal impacts after sequencing rules have been met, and provided that on-site mitigation has been investigated
Service Area		The rules establish a hierarchy for determining where mitigation projects can be located relative to the project impact. However, a venture service area would typically be defined as the same county, preferably within the same watershed segment. Exceptions are allowed for certain circumstances.
Consistency with On-site Mitigation Standards	**Quality Controls**	The quality control standards for commercial credit ventures (see Table 2) are generally the same as those applied to on-site mitigation projects, except for mitigation timing requirements. Commercial credit ventures will be allowed to sell some portion of credit capacity immediately following the construction of replacement wetlands provided that financial assurances are posted. By contrast, on-site mitigation is allowed to proceed concurrently with permit impacts, and no financial assurances are required as long as mitigation requirements are fulfilled before the completion of the permitted activity.
	Credit Requirements	Commercial credits defined as acres of wetland type. In-kind trades only. Trading ratios follow set formulas that vary according to wetland type and mitigation method. These range from 1.5 to 1 for emergent wetlands to 4.5 to 1 for scrub shrub or forested wetlands of "special state concern." In each case these trading ratios for commercial credit trading are 50% greater than the trading ratios applied when the on-site mitigation option is used.

‡Provisions as of Summer 1994.

TABLE 3. Area-Wide Rules for Commercial Credit Trading: Demand Side Provisions‡ (Continued)

3. MINNESOTA		
Area-wide Rule		Regulations (1993) establishing a state-wide credit trading system. "Local Governments Units" (LGUs) approve credit deposits and sales by private "account holders;" LGUs may also create credits for deposit and sale.
Market Type		In counties having more than 80% of pre-settlement wetlands, credit trading is allowed for any state permittee provided that the LGU determines that sequencing rules have been met and on-site mitigation is not "reasonable or desirable." In counties having less than 80% of pre-settlement wetlands, credit trading is allowed only for permit impacts involving 5 acres or less (after sequencing review and investigation of on-site mitigation).
Service Area		Service area is defined as county or major watershed, with certain exceptions.
Consistency with On-site Mitigation Standards	**Quality Controls**	The quality control standards applied to commercial credit sites (see Table 2) are comparable to those applied to the on-site mitigation option, except for the timing of mitigation. Commercial credit sites must be constructed at least six months before credits can be sold. By contrast, on-site mitigation can proceed in the absence of financial assurance as long as it is completed concurrently with permitted impacts.
	Credit Requirements	Commercial credits defined as acres of wetland type. Trading ratios determined case by case but subject to requirements. For in-kind trades within the same watershed, minimal trading ratios are: 1) 1:1 for impacted wetlands on agricultural land or trades within counties or watersheds in which 80% or more of pre-settlement wetlands remain, 2) 2:1 for impacted wetlands on non-agricultural lands or trades within counties or watersheds in which less than 80% of pre-settlement wetlands remain. For out-of-kind trades or trades outside of county of watershed, trading ratios range from 1:1 to 3:1 depending on the type of wetland impacted. These rules apply equally to commercial credit trades as well as to the on-site mitigation option.

‡ Provisions as of Summer 1994.

TABLE 3. Area-Wide Rules for Commercial Credit Trading: Demand Side Provisions‡ (Continued)

4. CHICAGO CORPS DISTRICT		
Area-wide Rule		Interagency agreement between the USACE, USEPA, and USFWS (1994). The USACE issues permits or signatory agreements to public and private credit ventures. (NOTE: Federal guidance was published in November 1995.)
Market Type		While the rules do not explicitly restrict the markets for credit ventures to certain types of 404 permits, they do say that: "It is intended that mitigation banks in Corps' regulatory jurisdiction be used primarily to mitigate wetland impacts associated with projects which, individually, affect relatively small acreage of low value wetlands or other waters of the U.S. Typically, these will be projects which, with mitigation, are currently authorized under nationwide Permit No. 26." The rules also stipulate that the mitigation sequencing rules must be met as a precondition for the commercial credit option, and that: "On-site compensatory mitigation will be preferred over the use of bank credits for projects where it is determined that replacing wetlands on-site is appropriate considering landscape function and the probability of mitigation success; conversely, banking is preferred where on-site mitigation would necessarily produce wetlands of low functional value or the mitigation would be prone to failure."
Service Area		Trades must be within the same regional watershed; the district is divided into five such watersheds. Exceptions allowed in certain cases but subject to higher trading ratios.
Consistency with On-site Mitigation Standards	**Quality Controls**	The quality control standards for commercial credit ventures (see Table 2) are more stringent than those typically applied to the on-site mitigation option. The rules for commercial credit trading include the following language: "Mitigation banks generally shall be held to higher standards of performance than conventional wetland mitigation sites." For example, credit ventures are held to more stringent success criteria, and easement are not always required in the case of on-site mitigation. Further, on-site mitigation is allowed to proceed concurrently with permitted impacts, but no financial assurance is required.
	Credit Requirements	Commercial credits defined in terms of acres of wetland type; in-kind trades only. For trades involving created or restored wetlands, trading ratios are 1 to 1 for certified credits, and 1.5 to 1 for uncertified or conditionally certified credits (see Table 2 for definition of certified and conditionally certified credits). For preserved or enhanced wetlands, trading ratios are determined in the venture approval process but will be much higher. For trades outside service area, trading ratios multiplied by factor of two. These requirements mirror those applied in the case of on-site mitigation. For on-site mitigation, which occurs concurrently with permit impacts (and thus is similar to uncertified or conditionally certified commercial credits), trading ratios are typically set at 1.5 to 1.

‡ Provisions as of Summer 1994.

TABLE 3. Area-Wide Rules for Commercial Credit Trading: Demand Side Provisions‡ (Continued)

5. GALVESTON CORPS DISTRICT		
Area-wide Rule		Interagency guidelines developed by the USACE, USEPA, and other federal and Texas resource agencies (1993). The USACE issues memoranda of agreement for public and private credit ventures. (NOTE: Federal guidance was published in November 1995.)
Market Type		Any 404 permittee after applicable sequencing rules have been met. The rules further state that: "...on-site mitigation will be preferred unless the applicant can clearly demonstrate to the Corps that compensatory mitigation from the bank will result in a higher quality wetland and environmental gain."
Service Area		Trades must be within the same watershed or hydrological basin.
Consistency with On-site Mitigation Standards	**Quality Controls**	The USACE District is currently developing criteria for on-site mitigation projects that will include standard success criteria and monitoring and maintenance requirements comparable to those required by the rules for commercial credit trading (see Table 2). However, while credit ventures cannot engage in credit use until replacement wetlands are constructed and certified successful, on-site mitigation will continue to be allowed to proceed concurrently with permitted impacts.
	Credit Requirements	Trading ratios for permittees determined case by case. In-kind trades preferable. Nothing in the rules suggests that a permit applicant would be held to higher trading ratios if commercial credit trading were used rather than the on-site mitigation option (all other factors equal).

‡ Provisions as of Summer 1994.

CHAPTER FIVE. WATERSHED PLANNING FOR COMMERCIAL CREDIT VENTURES

Another approach to establishing rules for commercial credit trading is to include them as part of a local watershed-based wetlands resource planning process, where the rules apply to a specific area coincident with the planning boundaries of the watershed. Circumstances surrounding particular wetland fill permits have motivated some communities to develop wetland plans that include market structure rules for commercial credit trading. These watershed rules are similar in many respects to the state and Federal rules for commercial credit trading reviewed in the previous chapter.

This chapter provides case study review and evaluation of watershed plans for wetland management. The watershed plans selected for study include those for which the development of commercial credit ventures was one objective of the planning process. For purposes of presentation and analysis, the market structure rules for commercial credit trading established by states and Corps Districts are referred to as regional or "area-wide" rules, while those market structure rules established as part of local watershed-based wetlands resource planning mechanism are called "watershed" rules.

Proposals to integrate wetland programs within an overall watershed approach now routinely appear at the Federal, state, and local level (Association of Wetland Managers 1994, The Wildlife Society 1994). The Clinton Administration's policy statement, *Protecting America's Wetlands: A Fair, Flexible, and Effective Approach* (White House Office on Environmental Policy 1993) supports linking of watershed and wetland management. States such as Delaware and California, to name only two, are advancing a watershed approach to focus on wetlands. Some local governments have initiated watershed-based wetlands resource planning to match Section 404 permit requirements with expected development pressures. Other locally initiated planning has focused on non-jurisdictional wetlands, leaving wetlands under Section 404 for Federal oversight.

Those who are apprehensive about off-site (and perhaps out-of-kind) mitigation support linking wetland regulation in general, and mitigation through commercial credit ventures in particular, to a watershed-based plan. The concern is that once ventures are operating, they will encourage making all wetlands available for fill, albeit with compensation requirements. Many believe that to counteract this possibility, a plan that identifies in advance areas where fill placement should be discouraged will protect high ecological value sites. In addition, a plan might identify areas where commercial credit ventures should be located to best protect and restore the wetland resource. These arguments help explain why the Clinton administration supports mitigation ventures in the context of watershed plans (White House Office on Environmental Policy 1993).

Specifically, the Clinton administration has argued that wetlands management including the Section 404 regulatory program would be best incorporated into an overall "watershed approach," that includes "appropriate watershed-based categorization frameworks."[22] Categorization ranks wetlands *in advance of an application for a fill permit* for their suitability for preservation and their suitability for development with compensatory mitigation. Categorization is not intended to determine which wetlands can be sacrificed, but rather is to assess, for each wetland parcel, whether that

[22] Arguments for categorization often cite advantages for non-regulatory wetlands programs. For example, the identification of ecologically valuable areas in the landscape may help target voluntary efforts to protect certain wetlands, may encourage landowners to be more careful with development activities near significant wetland areas, and may facilitate the targeting of programs to purchase wetlands or their development rights.

site could better contribute to the compatibility of development and wetlands management goals if the site were allowed to be filled in return for mitigation secured elsewhere in the watershed. Categorization can make the outcome of permit applications more predictable, which developers desire. In this way categorization can facilitate or even replace the sequencing process because the elements of sequencing—avoidance alternatives analysis, minimization, compensation requirements—are performed in the planning process [and result in the categorization of sites]. Also, the Administration's support for categorization in the context of commercial mitigation trading refers to the possibility that "advance planning can be used to identify appropriate locations for, and use of, mitigation ventures" (White House Office on Environmental Policy 1993).

When categorization is done at the level of detail that can yield these outcomes, it requires far more than identification, mapping, and functional assessment of wetlands, although these tasks are needed. The final step in categorization is to establish a public and agency consensus on the relative importance in the watershed of the wetland functions identified and measured at each site and at possible mitigation sites. Therefore, when categorization becomes the major product of watershed planning, it will involve multiple agency cooperation and agreement, public involvement, and application of complicated wetlands science protocols.

Such planning can be time consuming and expensive. Federal grants may be available to support a portion of the expense. To further encourage watershed-based wetlands resource planning and categorization, the Clinton Administration's position paper suggests that if commercial ventures are included in a watershed plan, public agencies should be permitted to tap state revolving funds for initial funding (White House Office of Environmental Policy 1993).

An alternative to parcel-specific advanced categorization is to develop clear and well publicized rules for categorization that will be applied to a site when a permit application for its development is received. In this case, permit applicants would have an initial idea of what the likelihood of receiving a permit is and what the compensation requirement is likely to be. However, actual categorization does not occur except in the process of reviewing a fill permit. The costs of this approach are associated with those studies and agreements that are necessary to achieve an advance specification of the categorization rules.

Wetlands Resource Plans to Support Commercial Credit Ventures

Advanced (parcel level) categorization of wetlands or the development of categorization rules is occurring in some areas in an effort to make clear what type of regulatory oversight (and mitigation) is appropriate for different parts of the watershed. It is possible, but often time consuming, to negotiate an agreement on parcel categorization or on rules for categorization among development and environmental interest groups, resource and regulatory agencies, and units of government. In some cases, the designation of specific parcels as off-limits to all development has led to "taking" claims among private property owners (see Appendix C). On the other hand, some environmental advocates feel that the categorization process compromises legal protection of all wetlands, and consequently have mounted legal opposition to such planning efforts (see Appendix C).

Advanced categorization of parcels and categorization rules have been developed as a part of many watershed plans. However, there is no precise definition of a watershed-based plan because of the variability in efforts labeled watershed plans or which claim to encompass the watershed approach. Indeed, the efforts commonly cited as examples of watershed-based planning, such as Special Area Management Plan (SAMP) and Advanced Identification Plan (ADID), do not always imply a particular type or scope of

planning, nor do they necessarily conform to a hydrologic watershed.

ADIDs are EPA-sponsored projects that map wetlands in a given area and assess their general suitability for development. ADIDs are not used to make any regulatory decisions, and are not themselves plans. However, they can (but do not always) contribute to planning efforts, as they have in many of this report's case studies.

SAMPs were authorized by the Coastal Zone Management Act amendments in 1980. However, the Corps associates the concept of SAMPs with locally-initiated area-wide wetland planning efforts, even those occurring in inland areas. It participates in SAMPs when they meet four criteria (Corps Regulatory Guidance Letter 86-10, 1986): (1) if there is a local lead agency; (2) if there is a significant conflict between development and wetland protection; (3) if there is public involvement; and, (4) if all parties agree at the outset that the effort will result in a regulatory end product (usually a general or programmatic permit). There is much latitude within these four criteria, and in individual SAMPs, they can look quite different from one another. In general, they merely imply an area-wide planning effort, with some local participation, that has as an objective a regulatory end-product.

Many efforts described as watershed-based (wetlands resource) planning were reviewed during the summer of 1994 in a preliminary fashion to determine their suitability as case studies for this report. The plans selected for detailed case analysis each included, as one purpose, facilitating the operation of commercial credit ventures within an overall wetlands management program. All of these plans include some type of categorization process (either specific mapping of wetlands or generation of categorization rules), although this is not true for all efforts claiming to be watershed-based plans. This is not surprising, as categorization of wetland sites—the specification of areas and wetland types in the watershed that need to be protected, can be restored, or can be developed—is also thought to be one of the contributions of watershed-based planning to commercial ventures.

Table 4 lists the plans reviewed for this chapter as well as their location and their status. Also included in Table 4 is a summary statement of the initial motivation for the planning effort including the categorization approach, and the commercial venture that was envisioned as an outcome from the plan.[23]

The selected planning efforts all had similar components, primarily because the plans examined attempted to implement the controversial exercise of wetland categorization. Categorization is controversial primarily because of the implied willingness to trade an existing wetland, however degraded, for a replacement wetland elsewhere in the watershed. While this occurs routinely in the case-by-case permit process, parcel-specific categorization makes an advance determination that a particular wetland site is available for such a trade. Categorization rules strongly suggest the acceptability of trading. Even if one agrees that different wetlands have different ecological value to the watershed, and the plan identifies wetlands entirely off-limits to development, to some, categorization implies a "weakening" of protection for all wetlands.

[23] The findings in this chapter are based on the review of a series of reference documents and interviews with plan participants. See Appendix A for a list of reference documents examined, see Appendix B for a list of those interviewed in Summer 1994.

TABLE 4. Characteristics of Watershed-Based Wetlands Resource Plans

Plan	Initiating Factors and Categorization Approach	Type of Venture (as of Summer 1994)
West Eugene, Oregon (West Eugene Wetlands Plan)	After wetlands were identified, there was local concern that a Section 404 decision would thwart development in the City of Eugene on land that had been zoned industrial. *Categorization of parcels* was completed for the watershed in advance of any permit application. The results of categorization were mapped.	Publicly capitalized venture
Juneau, Alaska Wetlands Plan– Coastal Zone Management Act Special Area Management Plan	City and Bureau of Juneau (CBJ) wanted to enable development activities, and simplify wetland permitting. Much of the remaining developable land in Juneau is wetlands. *Categorization of parcels* was completed for the watershed in advance of permit applications. The results of management categorization were mapped.	Publicly capitalized venture
Meadowlands District, New Jersey Coastal Zone Management Act Special Area Management Plan	Hackensack Meadowlands Development Commission (HMDC) felt that Federal wetland laws were preventing it from achieving multiple planning objectives (development and environmental protection). Initiating a collaborative planning process seemed a way to resolve conflicts. *Categorization of parcels* for management was completed for the watershed in advance of any permit application. The results of categorization were mapped.	Ventures will likely be capitalized with public and private sources
DuPage Co., Illinois (Winfield Creek and Cricket Creek watersheds) 289 square miles	State ordinance created a county agency primarily focused on stormwater. The county agency promotes no-net-loss/restoration of wetlands, and initiated this effort. *Categorization rules* completed in advance of any permit application. Specific categorization not completed unless a permit application is filed.	Venture capitalized by permit fees
Dade County/Bird Drive and North Trail Basins (Part of Special Area Management Plan), Florida	County extended urban services boundary into wetlands. School board applied to build a high school in wetlands; to resolve permitting difficulties, the Corps required either an EIS or a SAMP. County's Comprehensive Plan required a wetland plan before any development could occur in the North Trail and Bird Drive Basins so that flooding is not increased and habitat values are maintained. Extensive categorization efforts were used, but the County ended up not employing the results of these in establishing mitigation requirements. Instead, a flat mitigation fee is charged for development activity in all wetlands (apart from tree islands, which the plan designates for protection).	Venture capitalized by permit fees

Given the need to build agreement on categorization, the formal plans reviewed here included three identifiable components: process, technical analysis, and implementation. Participants in the planning *process* commonly included Federal and state regulatory agency personnel, representatives from local governments, interest groups, the development community (wetland permit seekers), and any interested citizens. The planning process offered the opportunity for negotiation and for trust building between disparate interests over technical protocols *and* tradeoff decisions. The more complex processes in West Eugene, Juneau, and Meadowlands District led to *parcel level categorization*. Alternatively, the planning processes in Dade and DuPage Counties established a set of categorization rules rather than a specific map. While these categorization rules are to be applied to all parcels, these plans generally did not specify in advance which individual parcels were to be developed, preserved, and restored.[24]

The *technical* challenges of setting goals, mapping (identifying) wetland and upland parcels, and functional assessment of the identified wetlands, is central to wetland parcel categorization in a watershed context. The mapping and functional assessment was performed through EPA's Advanced Identification (ADID) process in many of the plans, including West Eugene, Meadowlands District (Hackensack or HDMC), DuPage County, and Dade County. Commonly used functional assessment methods include the Wetland Evaluation Technique (WET), used for example in Juneau, and the Habitat Evaluation Technique (HEP), used in Dade County. Several of the plans devised their own method of functional assessment, combining information from many ecological indices.

In parcel level categorization, the tradeoffs and choices among the assessed wetlands were made in relation to a prior agreement on a statement of watershed goals. The watershed goal may be limited to a policy that there should be no-net-loss of the mapped and measured wetland functions or acreage, followed by net-gain. This means essentially that wetlands are parceled and the individual functions identified are determined to be preserved, mitigated on-site, or subject to trade across the watershed. A truly unique habitat for an endangered species may be saved, a function such as stormwater retention may be required to be mitigated on-site, and a function related to habitat biodiversity might be determined to be better achieved elsewhere in the landscape in an upland/wetlands complex. A review of the technical protocols used for wetland categorization in the case study plans follows below.

- West Eugene was an EPA ADID site, so wetlands were mapped and their functions identified. The plan created a watershed vision of net gain of wetlands functions. Parcel specific categorization of wetlands was based on the compilation of many ecological and socio-economic factors and the plan's vision.

- Juneau's wetlands were initially identified and mapped by the Corps, but more detailed mapping and functional assessment was performed during the categorization process using the Wetlands Evaluation Technique (WET). Wetland parcels were initially categorized combining this information with results of a survey of public preferences for management and an assessment of development alternatives. The Corps later revised this categorization scheme in developing the General Permit to better reflect the standard of minimizing environmental impacts. The goal of the plan is to accommodate and reconcile economic development and environmental protection objectives.

- The Meadowlands District was also an EPA ADID site, but parcel-specific categorization

[24] In Dade County, one type of wetlands (tree islands) was specified for protection.

was done by examining the functions that wetland parcels would provide under different land use alternatives in the SAMP's Environmental Impact Statement. A preferred alternative was selected that specifies allowable activities on different wetlands. This method of categorization effectively accomplishes some of the alternatives analysis (part of sequencing) that permit applicants would otherwise have to undertake. The goal of the plan is to accommodate and reconcile economic development, transportation improvements, and environmental objectives.

- DuPage County was also an EPA ADID site, but planning efforts did not specifically categorize wetland parcels in advance of permit applications. Rather, a county ordinance established conditions under which wetlands would be categorized as "critical" (requiring more mitigation) and "regulatory." The objectives of the plan are to ensure true no-net-loss of wetlands, because the plan focuses on non-jurisdictional (in addition to jurisdictional) wetlands. The effort focuses not only on wetlands but also on stormwater management.

- The Dade County (East Bird Drive and North Trail Basin) SAMP specified that one type of wetlands, tree islands, would be protected on-site. In regard to other wetlands, the plan specifies mitigation requirements (made by a SAMP committee comprised of many agencies). The planning effort included significant efforts at categorizing individual parcels, including a HEP analysis. However, in the end, mitigation requirements (fees) for all wetlands, excluding tree islands, were made the same. Most mitigation work is being done off-site (much goes to Everglades restoration in the National Park), so the plan does not specify particular trading rules. The plan focuses not only on wetlands restoration and protection, but also stormwater management and aquifer protection.

Plan implementation means putting in place the means to achieve planning goals. One important component is the operation of successful commercial credit ventures. The status of venture implementation varies among the case study plans. Final public notice for the initial West Eugene venture was issued, and state (Division of State Lands) and Federal (Corps of Engineers and EPA) approval was received in late 1994.[25] The long-term status of the plan and the venture remains uncertain, however, due to legal challenges to the categorization effort.

The West Eugene plan specifies credit requirements for a permitted fill based on wetlands type. These requirements follow from the watershed goals that were established in the plan. Of five wetlands types in the watershed, four are to be replaced in-kind. Only disturbed agricultural wetlands may be replaced with different wetland types. Because the plan specifies how many acres of each type are to be impacted, the plan also estimates how many mitigation credits of each type of wetland are needed. With this information in mind, the public venture was designed and capitalized to sell credits for certain fill permits made at particular wetland parcels. Prior to this time, credits for at least one commercial venture were sold under terms that conform with the plan.

A goal of the Juneau plan was to receive a Corps Programmatic General Permit. The City and Bureau of Juneau (CBJ) would have used this permit to make permit decisions for two lower value categories of wetlands and to develop its own commercial credit venture to sell credits for fills made in these categories. The plan called for the Corps to continue to issue permits for the two higher value categories of wetlands. However, the General Permit application met with environmentalist opposition, at the national level, to the categorization process that left a very small fraction of Juneau's wetlands available for development without mitigation (see Appendix C). The original Programmatic General Permit (PGP)

[25] A MOA was signed in Fall 1995.

draft by the Corps Regional Office was held in abeyance by Corps Headquarters in 1994, in response to the opposition. At that time, the Corps Regional Office instituted an interim "Accelerated Individual Permitting Procedure," an arrangement that would require both the Corps and CBJ to issue permits and observe the process, prior to issuance of a PGP. CBJ's construction of the credit venture and resolution of details regarding its operation have been delayed partially because of problems obtaining the general permit.[26]

The Meadowlands District SAMP and EIS were being reviewed by appropriate resource agencies as of summer 1994. Assuming that this and a later public review (and any revisions to the plan) went smoothly, the plan was slated to go into effect in the fall of 1995.[27] Mitigation is a major component of the plan. An interagency mitigation agreement, incorporated into the SAMP, will clarify mitigation policies.[28] This Interagency Agreement, along with the SAMP and EIS, will not exclude the possibility of commercial credit ventures, although any venture will require Corps approval. Indeed, the Hackensack Meadowlands Development Commission (HMDC) plans to operate a public credit venture. The SAMP states that credits can not be sold until the commercial venture contains fully functioning wetlands. However, there was some possibility that this requirement would be relaxed according to how Federal mitigation guidance evolved. HMDC is in the very early stages of planning its venture, however, so it will be several years before any public credits will be available. There apparently has been some private sector and speculator interest in ventures as well. However, HMDC has not yet resolved many questions regarding how to structure the public venture, and how to accommodate the operation of any private ventures.

Dade County initiated a SAMP process for the nearby Bird Drive and North Trail Basins, mainly because the Corps required a SAMP or EIS to resolve permitting issues associated with urban growth in the area, and the County's Comprehensive Plan required development in the area to conform to a basin-wide wetlands plan. The plan also specified general mitigation requirements, including fees for developments on non-tree island wetlands within the "urban development boundary" of the area covered by the plan. The mitigation fees are based on estimates of the cost of mitigation in the "Hole in the Donut" restoration project in Everglades National Park; all mitigation is to be done off-site. Most of the funds go toward the "Hole in the Donut" restoration project, although a portion of the mitigation fees are placed in a trust fund to acquire and restore wetlands elsewhere in Dade County.

DuPage County, like Dade, had not established parcel-specific mitigation requirements for wetlands within the planning area. The county has established rules which authorize the collection of fees for mitigation of non-jurisdictional wetlands, however. An intent of the planning is to streamline wetland permit applications, and the Corps has issued a general permit to the DuPage County Department of Environmental Concerns to help it administer the plan. While the county credit ventures established to date service only non-jurisdictional wetlands impacts, DuPage County has just acquired a general permit that will enable it to provide mitigation for jurisdictional wetlands in one area. DuPage's planning effort is not a SAMP, but rather resulted from a local county stormwater ordinance that authorizes the effort, categorization rules, and plans for individual watersheds and credit supply ventures. The intent of the plan was to achieve no-net-loss, as well as make it possible for the county to streamline the regulatory procedure for permit applicants.

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[26] The PGP was issued on June 30, 1995. A notice of intent to sue has been filed to challenge the General Permit, but legal action has not yet occurred. The final plan decreased the amount of wetlands in the two lower value categories.

[27] The Federal Draft EIS was issued in July 1995. As of early 1996, the Final EIS is under development.

[28] The Corps intends for a General Permit program and abbreviated permit process to implement development continued in the SAMP.

Contribution of Wetlands Resource Plans to Commercial Venture Success

Watershed-based planning can, like area-wide rules for commercial trading, create the framework within which individual venture agreements are established and in so doing can influence both the demand for and the supply of credits. Like area-wide rules, many of the watershed-based plans specify what constitutes acceptable mitigation for particular wetland parcels. The degree of specificity contained in the plans regarding mitigation requirements varies. For example, the West Eugene plan identifies credit requirements for all the different types of wetlands found in the area, and where in the watershed mitigation siting is acceptable. The Juneau plan calls for a "Wetlands Review Board" to apply a formula to a permit application to determine the necessary mitigation. In DuPage County, the planning effort calls for "critical" wetlands to be mitigated at a higher credit trading ratio than "regulated" wetlands. Many of the plans favor on-site and in-kind mitigation and limit use of credit ventures as a last resort. The plans with public ventures also specify who can use the venture. For example, the Juneau plan only allows developers with minor wetland impacts (less than 5 acres) to use the public venture. The watershed-based wetlands resource plans reviewed here are only partially developed, but the following lessons may be drawn.

Factors Influencing the Supply and Cost of Credits

Quality Control

Many of the plans specify success criteria for mitigation sites, monitoring and maintenance requirements, and long-term site protection for commercial ventures. However, as a *general* rule, there appears to be less of an emphasis on financial assurance requirements (such as posting a bond to assure success) in public ventures compared to private ventures, although there are exceptions. It seems common for a plan to create some public entity with the charge of overseeing a mitigation venture. The assumption seems to be that the venture will succeed because it will be administered by a public entity and is included in an area where a watershed plan has been prepared. This is consistent with the way publicly capitalized ventures developed outside of watershed plans have been treated (see Chapter 3).

In West Eugene, a publicly capitalized venture is administered by the Wetlands Administrative Group that was set up through the watershed-based wetlands resource planning process. No mention is made of other credit ventures. In Juneau, the only credit supplier mentioned is a public venture overseen by the Wetlands Review Board (created by City ordinance; an independent board composed of two planning commissioners and five private citizens having expertise in specified relevant technical fields). The West Eugene plan does have some formal requirements for performance bonding, limitations on the time of credit sale, and monitoring and maintenance requirements. It has some consideration of long-term management, although long-term maintenance requirements are more vague. In Juneau, monitoring and performance criteria are to be established by the "Wetlands Review Board," whose certification is required before credits can be sold. According to the Juneau plan, there appears to be little long-term monitoring, although the Wetlands Review Board must prepare an annual report describing the status of the commercial credit ventures. The fact that these are public ventures sited on public land may make the requirement for long-term management less important as a quality control consideration.

The Hackensack Meadowlands Development Commission (HMDC) currently has plans for a public venture, but there also is some interest in private ventures. Rules established by the SAMP and EIS are expected to cover all types of ventures. The Meadowlands District SAMP, Interagency Agreement, and EIS prohibit the sale of credits for any commercial venture until the wetlands are certified successful (although this may be relaxed in the future). In this way, the ecological success of the venture is assured.

These conditions may be a consideration for gaining approval by state and Federal authorities for the plan. However, it does not appear that the possibility of posting a financial assurance, in lieu on what might be required from private ventures. Also, the accounting guidelines call for creation of an interest-bearing investment fund for unforeseen expenses, which appears to be an attempt to

Service or are earmarked for acquisition and restoration of wetlands elsewhere in the county, so demand for credits is not crucial to success of an individual operation as it is in DuPage County.

Market Area

In West Eugene, a preference for credit purchases from the venture is given to permit applicants within the plan boundary (first come-first served); however, excess credits may be available for properties outside the planning area as long as a small fraction of the credits remain available within the plan area.

In the Meadowlands District, the wetland venture must be located in the planning district. Priority for purchase of credits will be given as follows: projects consistent with the approved SAMP; projects located in the District and that have received all necessary permits but are not consistent with the SAMP; projects located in the state of New Jersey but outside the district and which have received all necessary Federal and state permits and which have been directed to the IMTF by the DEP (State) Wetlands Mitigation Council.

In the Dade County North Trail and Bird Drive SAMP, each permitted wetlands fill within the Urban Development Boundary (covering a portion of the SAMP) is required to contribute to the "Freshwater Mitigation Trust Fund." Areas outside the Urban Development Area that cannot do on-site mitigation may also contribute to this fund.

In DuPage County, several ventures have begun collecting fees. Until recently, most ventures could only serve impacts for Federally non-jurisdictional wetlands, although one of the ventures (Cricket Creek) now has received a General Permit from the Corps to serve jurisdictional wetlands as well. Different ventures are to be used within particular "watershed planning units" in the county. For example, the Winfield Creek Venture is to be used for development within the West Branch DuPage River Watershed Planning Unit.

Regulatory Consistency For All Mitigation Options

In general, the watershed plans do not directly address this question. Regulatory consistency is difficult to assess because few of the public ventures are actually in operation. It should be mentioned that the DuPage County planning effort does explicitly state that commercial credit ventures will be subject to the same quality control requirements as permit recipients that choose to do mitigation work themselves.

Summary

All of the plans reviewed in this report have undergone a long and intensive planning process, and some planning is still in progress. The costs of planning can be significant. For example, the West Eugene planning process involved several hundred thousand dollars for such activities as technical studies and staff time. Much of the costs of developing the West Eugene Plan were actually provided by Federal agencies, including EPA and the Corps. This is likely to be an anomaly, however, for these Federal agencies were interested in West Eugene as a pilot program. Besides direct financial outlays, there are also costs associated with planning that are more difficult to measure, such as the cost of volunteer time spent by different stakeholders. In addition, there are opportunity costs to funds and time spent on planning that must be considered; the planning process can take many years, over which problems may change or become more acute. Finally, and most significantly, the takings issue and the conflicts with environmental advocates (see Appendix C) can be a barrier to plan implementation. In sum, it appears that much of the delay and financial costs of planning is due to the need to forge agreement on specific areas designated for development, preservation, and restoration in advance of fill permit decisions.

Concern for planning costs are especially important given that there is no guarantee that planning efforts will lead to a consensus on a

desired outcome, including commercial credit trading. This was found to occur in one Special Area Management Plan (Mill Creek) that was reviewed for another study conducted for the National Wetland Mitigation Banking study (White and Shabman, in prep.). Negotiations among stakeholders broke down well into the planning process, after many hundreds of thousands of dollars had been spent. In addition, many are disillusioned by the effectiveness of planning, feeling that plans will never be fully implemented. They would prefer effort to be spent on activities that can be described as "implementation" rather than on planning. Thus, not only can planning be costly, but there often is an understandable reluctance to allocate funds to planning activities. In sum, there are reasons for watershed-based wetlands resource planning (that attempts rigid categorization) to be approached with caution.

While there are prospective benefits of planning and wetland categorization, planning can consume significant amount of time and resources, the commitment of which may not be justified by the benefits received. Indeed, since there are many operating ventures that have been approved outside watershed-based plans, and since their potential for ecological and economic success seems high (see Chapter 3), the costs and delays associated with categorization through watershed-based planning may not be warranted for supporting commercial credit ventures. Therefore, the Dade and DuPage approaches of establishing categorization guidelines without parcel level categorization may be a more practical and less costly option.

CHAPTER SIX.
FINDINGS AND CONCLUSIONS

A mitigation credit market emerges when one or more commercial ventures sell credits to one or more permit applicants in some area for a price established by bargaining among sellers and permit applicants. Mitigation credit markets can only exist as a response to wetlands regulations. The regulatory challenge is to establish rules for commercial credit trading that will promote mitigation success through credit markets.

Success can be defined at both the venture level and market level, and in both ecologic and economic terms. At the venture level, ecological success means that a venture's replacement wetlands successfully reproduce the desired functions of the filled wetland. Economic success at the venture level means that a venture's sales revenues are sufficient to cover its own estimates of the commercial cost of producing credits. Market level success means that the total credit output of all ventures is based on ecologically successful replacement wetlands and able to meet the demand for credits for the area being served, at prices that recover production costs.

The determinants of venture and market level ecological and economic success were developed and organized around a demand and supply framework. That framework provided a "check list" which was used to evaluate area-wide rules and policies and watershed-based wetlands resource plans which were developed to guide the development of individual venture agreements.

Finding 1

Despite their potential economic and ecological advantages, most operating private credit ventures have had to invest excessive time and effort to gain regulatory approval. Also, regulators and resource agency staff alike have been frustrated with the lack of a national policy (until very recently) for designing and implementing commercial venture agreements. The area-wide rules (reviewed in Chapter 4) are attempts to provide a regulatory framework for commercial credit ventures in specific areas of the country.

Conclusion 1

If commercial venture credit sales are an acceptable instrument of wetland regulatory policy, national policy guidance should affirm the support for commercial credit markets and describe general principles that field offices should use to prepare and sign venture agreements. Any specific set of area-wide rules should be tailored to regional circumstances.[29]

Finding 2

While private credit ventures only have been selling credits for a short time, the agreements under which they were authorized generally match the determinants for success established in this report (see Chapter 3). And importantly, the agreements in each case were tailored to be sensitive to the particular economic and ecological circumstances faced by the venture.

Conclusion 2

National policy guidance and area-wide rules should be flexible enough to accommodate situation-specific conditions under terms that will maintain the likelihood of ecologically and economically successful mitigation. Development of a conceptual framework and general principles for designing venture agreements, including illustrations of alternative ways to meet the general

[29] As noted previously, Federal guidance was published in November 1995 (Federal Register 95-29023).

requirements for success, would assist planning and design of commercial ventures.

Finding 3

Commercial credit sales will be permitted when they help assure the ecological success of wetlands mitigation. However, commercial ventures also must meet their financial objective in relation to their commercial cost. Some ventures have low commercial cost because they have true cost advantages or because they use different judgements about which expenses are part of commercial cost. Some fee systems have been put in place as stop-gap measures until more formal analysis of costs can be done. These fee systems should not be judged by the criteria offered in this report until they are more fully developed. On the other hand, the publicly capitalized ventures studied for this report, and some fee systems, appear to employ different cost accounts than the private ventures and may not offer adequate financial assurance against mitigation failure. In addition, it appears that some of the area-wide rules, as now written, do not address cost accounting issues, and do not describe venture financial conditions that should be maintained to provide assurance against mitigation failure.

Conclusion 3

Regulatory and resource agencies developing regulations and general guidelines that affect supply and cost of commercial venture agreements need to consider (1) Quality controls (across all venture types) which should include provisions for monitoring and maintenance, long-term site protection and management, and financial assurance against mitigation failure, unless the ecological conditions at the venture sites have a high probability of immediate ecological success, and (2) Cost accounting and credit pricing, practices at public ventures and fee systems, to assure adequate funds to secure mitigation success.

Finding 4

A strong demand for venture credits can increase the potential for economic success of commercial ventures. Rules that could increase the demand for venture credits include allowing credit sales in multiple sub-markets, defining wide market service areas, and ensuring regulatory consistency across mitigation options. The venture agreements now in place appear to do little to restrict the market area or the sub-market into which credits can be sold; however, the area-wide rules and guidance studied for this report suggest that there should be limitations on venture sales possibilities. Area-wide rules also emphasize the predominance of sequencing and are often silent on the mitigation quality assurance that would be expected for on-site mitigation. These factors can reduce the potential for economic success by reducing the demand for venture credits.

Conclusion 4

If there is a desire to have economically successful credit ventures and markets, then the following steps should be considered by local entities:

1. Allowance of fill-permitting decisions to make ecologically justified deviations (e.g., in the context of watershed plans) from sequencing to increase the demand for commercially-produced credits. One step would be to (1) request that fill-permit proposals include a justification for why the use of venture credits is an ecologically superior alternative to avoidance, minimization or on-site mitigation, and (2) to instruct regulators to consider that justification in reviewing the fill permit.

2. Increase the demand for credits by increasing the mitigation requirements for permits issued under Nationwide 26 and by encouraging state and local interests to adopt permit programs that extend to areas outside 404 jurisdiction. The simplest approach may be to require a small fee for permits issued under these programs. The fee could be administered in any of the ways described in Chapter 3 of this report. To minimize the possible assertion

that a fee requirement, no matter how easy it is to obtain the fill permit, is an intrusion on land use rights and an unnecessary regulatory burden for limited environmental gain, the smallest fills might be exempted. Also, for most fills under these expanded programs, fees could be less than the cost of replacement wetlands. This is the approach and logic used in one of the operating fee-based systems.

3. Fill permitting actions should require that on-site mitigation include quality controls against mitigation failure consistent with those imposed on commercial credit ventures, and that these controls be enforced.

Finding 5

Watershed-based planning for wetlands management, that supports commercial credit trading as one purpose, has included multiple stakeholder participation for trust-building among participants, technical protocols for detailed wetlands identification and categorization based on watershed goals, and implementation strategies that rely on non-regulatory mechanisms. One benefit of such a watershed-based planning effort may be to streamline the regulatory process categorization of wetlands in the plan. Categorization has been proposed in the plans as a substitute for sequencing when each individual permit application is filed. However, preparation of plans that include detailed categorization can be costly and time-consuming, and there is a risk that the planning process may end without agreement. On the other hand, a number of commercial ventures have been authorized to operate, and are operating, without reference to watershed-based planning. In addition, the case studies in Chapter 3 suggest a high potential for economic and ecological success for many of these ventures.

Conclusion 5

There may be valid reasons for initiating a watershed-based wetlands resource planning process to categorize wetlands in a landscape setting for both regulatory and non-regulatory management programs. However, the support offered to commercial venture success does not appear to be a sufficient reason to incur significant planning costs. Mapping of wetland sites using low cost approaches that draw on existing data sources may be useful if the purpose is to help ventures assess the demand for credits that might be present in their potential sales area. Detailed wetland delineation and functional assessment of the regulated wetlands only would be accomplished as part of the fill-permit application process. This descriptive mapping activity is consistent with the ADID process that has been undertaken in some areas, but is not the equivalent of watershed-based wetlands resource planning. Perhaps the most effective contribution of watershed-based planning is the establishment of categorization rules that provide a consistency for establishing permit requirements in advance of the application process.

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VENTURE SPONSORS AND REGULATORS INTERVIEWED

Name, Venture, Agency

- Bates, Terri, South Florida Water Management District
- Bierly, Ken, West Eugene WMB, Astoria Airport WMB, Oregon Division of State Lands
- Blossoms, Rod, City of Logan, Utah, WMB, City of Logan
- Carroll, Barbara, Friendship, Texas, WMB, Friendwood Development Corporation
- Clark, Loren, Placer County WMB, Placer County Planning Department (California)
- Clearwater, Denise, Maryland Wetlands Compensation Fund, MD DNR
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- Henson, William, U.S. Army Corps of Engineers (Little Rock District)
- Hey, Donald, Wadsworth Bank, Wetlands Research, Inc. (Illinois)
- Hopen, Richard, Florida Wetlands Bank
- Hull, Clark, Southwest Florida Water Management District (Florida)
- Kinter, Steve, Volusia County WMB, Volusia County Environmental Management Department
- Koros, John, Harris County Flood Control District, Texas, Harris County Flood Control District
- Lowe, Glen, St. Johns River Water Management District, Florida
- Martindale, Molly, U.S. Army Corps of Engineers (San Francisco District)
- Matuziak, Mark, U.S. Army Corps of Engineers (Chicago District)
- Morse, Peter, Sacramento County, CA, WMB, Sacramento County Planning Department (California)
- Myers, Erik, East Bird Drive Basin Fee and Bird Drive and North Trail Basin MB, Dade County, Florida, Dade County Department of Environmental Resources Management
- Pashley, David, Pine Flatwood Wetlands Mitigation Trust, St. Tammany Parish, Louisiana, The Nature Conservancy
- Redmond, Ann, Florida Department of Environmental Protection
- Rice, Steve, DuPage County, IL, Winfield Creek, DuPage County Department of Environmental Concerns
- Rolband, Mike, Neabsco, Wetlands Solutions, Inc. (Virginia)
- Russell, T. Logan, Delta, Delta Environmental Land Trust (Mississippi)
- Ryan, John, St. Charles WMB, Land & Water Resources Inc. (Illinois)
- Schwinline, Alan, Lake County WMB, Lake County Stormwater Management Commission (Illinois)
- Shead, Linda, Galveston Bay Foundation WMB, Galveston Bay Foundation
- Slatery, Mike, Maryland Wetlands Compensation Fund, MD DNR
- Slayton, Mike, and Rob Robbins, South Florida Water, South Florida Water Management District

- Smith, Kevin, Maryland Wetlands Compensation Fund, MD DNR
- Squillace, Vince, and Scott Doran, Ohio Wetlands Foundation WMB, Ohio Wetlands Foundation
- Stillwell, Brooks, Millhaven WET (Georgia)
- Stockdale, Erik, Mill Creek WMB, Washington Department of Ecology
- Straka, Ron, City of Renton, WA, City of Renton
- Wheetly, Mark, Bracut Marsh WMB, California Coastal Conservancy
- White, Elizabeth, San Diego Vernal Pools, U.S. Army Corps of Engineers (Los Angeles District)
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Juneau, Alaska

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APPENDIX C. EXPERIENCES WITH WATERSHED MANAGEMENT PLANS FOR WETLAND CATEGORIZATION

The task of wetlands categorization has been identified as a central contribution of watershed planning for wetlands management. Wetland categorization within watershed-based planning includes more than identifying (delineating) and then mapping wetlands in the landscape. Complete categorization also includes functional assessment and then a social decision on which wetlands will be preserved, which will be available for fill with compensation, and which will be targeted for restoration. Categorization efforts, to be successful, need to earn the support of both private property owners and environmental interests.

Some interests have expressed support for watershed-based wetlands categorization as a condition for designing and authorizing commercial ventures. Also, it was found that all of the watershed plans examined that included commercial ventures as a component also included some type of categorization effort. This Appendix describes the categorization experiences in each of the case study areas, as of summer 1994.

West Eugene, Oregon

The West Eugene Wetlands Plan covers an approximately 8,000 acre area of the Amazon Creek Drainage basin in the western part of the city of Eugene, Oregon.

Why Categorization Was Done

Categorization was felt to be needed to determine areas suitable for protection, restoration, and development, consistent with the plan objective of "finding a balance between protection and development that meets state and federal laws," put forth by the Eugene City Council. Categorization was an essential component of the planning process, which consisted of: establishing goals and a landscape vision; assessing wetland functions; involving citizens; balancing functions, values, and land use; and ranking and categorizing wetlands.

The language in the public notice regarding the West Eugene Plan indicates the purpose of categorization: "Review of the plan (i.e., the results of the categorization process) by the Corps and EPA will determine whether the Plan has identified the least environmentally damaging, practicable alternative for future urban development in West Eugene, as required by Section 404 guidelines. If the plan is approved, then the Corps proposes to adopt an alternative permitting procedure for processing applications for the filling of wetlands within the Plan area under Section 404." The proposed procedure calls for the Corps to issue more streamlined Letters of Permission rather than standard individual permits. The Oregon Division of State lands has similar requirements for approving the plan, particularly requirements that identified losses must be fully compensated, and all practicable alternatives must be considered. In short, the purpose of categorization was to accomplish the sequencing/alternatives analysis process for the watershed as a whole—ahead of actual permit applications. By doing so, it streamlines the review of permit applications, and makes the outcome of applications more predictable for applicants.

How Categorization Was Done

Categorization was accomplished in several steps. Wetlands in the study area were mapped and their functions assessed through an ADID (advance identification) grant from EPA in 1989. The process of classifying[30] wetlands was done by

[30] Often, the terms classification and categorization are used interchangeably. In the W. Eugene plan, classification refers to the distinctions between types of wetlands based on functions and ecological characteristics alone, whereas categorization refers to

(continued...)

overlaying the ADID data with information on flooding, soil types, the historic distribution of wetlands, rare plant and animal species, waterways and drainages, winter waterfowl, and amphibian and reptile species distributions. But, grouping wetlands into management categories (categorization) was based on a broader set of criteria, which included additional factors such as: whether the parcel was designated in Eugene's Metropolitan Plan as a natural resource; proximity of the parcel to the 100 year floodplain; proximity of the parcel to a perennial waterway; whether the parcel was connected to other wetlands or waterways; presence of a high diversity of wildlife habitat on the parcel; presence of unique Willamette Prairie Grassland on the parcel; if the parcel already has an approved wetland impact permit or EIS; if the parcel is relatively isolated; if the parcel is served by existing streets, roads, sewer, and water; if the parcel is adjacent to, or surrounded by, existing development; and if the parcel has frontage on a major highway or street. As is evident, the West Eugene categorization scheme considered both ecological and socio-economic factors. Citizens were allowed to comment on categorization results, and direct mailings were sent to inform property owners and solicit input.

Results/acceptance of Categorization

According to descriptive material in the West Eugene plan, the categorization process went relatively smoothly. Evidently, the designation of only 6 out of 60 wetland parcels was debated. The process resulted in over 1,000 acres of wetland recommended for protection or enhancement and 288 acres recommended for development. Initially, all wetlands were put into two categories, develop or protect. Ultimately, the categorization process led to four map designations in the plan: (1) wetlands to be protected; (2) wetlands to be restored; (3) wetlands suitable for fill and future development; and (4) uplands to be protected as connections between wetlands and along stream courses. The plan also required wetland buffers, the size of which varied depending on the characteristics of each wetland.

Special Characteristics of the Categorization Experience

First, the mapping of where wetlands should be protected in advance of permit applications has led to some concern for taking claims. Many of these problems were alleviated when the Bureau of Land Management paid many landowners for their land if it was formerly zoned as industrial but protected by the plan. But BLM funds were not sufficient to purchase all the land designated as protected, and potential taking problems remain. Local interests would prefer that Federal regulatory agencies incur the wrath of property owners with taking claims, rather than themselves. Therefore, it is their wish that the Corps assist in implementing the plan by refusing to grant permits for property specified as to be protected, so they would not have to re-zone it from developable to protected status. This would make the Corps—rather than local jurisdictions—subject to taking claims. There is some indication that the Corps is unwilling to play this role.

Part of the planning effort in West Eugene included lobbying at the Federal level. This lobbying effort has been effective, judging by BLM's land acquisition activities, which have certainly helped implement the plan. In fact, the taking problem was avoided to some degree because of the receipt of Federal funds for land acquisition. The Federal appropriations were made in recognition of the regional and national values represented in West Eugene, as well as for the model plan that West Eugene developed. While acquisition can be a useful tool in wetlands protection through planning, there are at least two points that should be noted. First, the likelihood that the Federal government could spend significant sums of money and buy out landowners for every plan in the country is slim, given scarce resources in the Federal treasury. The second

[30](...continued)
wetland ranking or grouping for policy decisions (i.e., protect, restore, develop, etc.). This word choice is adopted in this report.

point from this example is the problem of how to undertake a land acquisition program. In West Eugene, BLM purchases are based on independent appraisals to determine fair market value. When wetlands are buildable, their value is based on highest and best use of the parcel (commercial, industrial, or residential). However, development is probably not imminent on all parcels that BLM purchased, and if sold on the market, not all of it would fetch the same price as if it were ripe for development, which may have been what was paid. The point is that if acquisition is a viable option, there may be additional ways to cost-effectively purchase wetland protection or restoration, such as a purchase of development rights program. While such options may not have been available in West Eugene, they may be worth exploring.

Juneau, Alaska

The Juneau Wetlands Management Plan covers a 15 square mile area in and around the city of Juneau, Alaska, 54% of which is wetlands. The City and Bureau of Juneau (CBJ) has taken the lead in developing the plan.

Why Categorization Was Done

The CBJ felt that categorization is necessary to meet the goals of the plan, which are to: (1) create a more stable economic environment by increasing the predictability of land use decisions; (2) decrease the time it takes for applicants to obtain decisions on discharge of dredge and fill permit applications; (3) allow careful development of some less valuable wetlands; and (4) provide protection for moderate- and high-value wetlands. Wetland regulations are a very important issue for the city, because so much of the developable land of the city is wetlands. CBJ felt that categorization will allow the city to direct development to less valuable wetlands, while concentrating protection efforts on the more valuable parcels. CBJ also felt that the provision in the plan of a public mitigation bank will help ensure that there will be no net loss of wetland functions and values.

As in West Eugene, a purpose of the categorization process was to accomplish the alternatives analysis/sequencing requirements for the whole area ahead of actual applications, and by doing so, streamline actual permit applications. The plan states that the basis of the categorization process is the Corps' public interest review process (PIRP), which calls for a balancing of many different factors in the public interest. The plan's categorization process includes three components: (1) a comparative environmental evaluation of wetland functions; (2) an assessment of the public preference for how each wetland should be managed; and (3) an analysis of practicable alternatives for each type of land use. The Corps revised the ultimate categorization scheme, however, to ensure that the standard of minimal environmental impacts was maintained.

Addressing the regulatory requirements of sequencing, alternatives analysis, and in-kind compensation is apparent in the Juneau Plan's formulation of categorization and trading rules. The original Juneau plan called for local issuance of permits for the two lowest-value classes of wetlands following a Corps Programmatic General Permit, while the higher value wetlands would continue to be regulated under individual permits under Section 404. For those wetlands the CBJ Wetlands Board would have presumed that less damaging practicable alternatives to the proposed development are not available. Moreover, the mitigation policy adopted by the Plan is patterned after the Federal mitigation sequencing, including requirements for avoidance, minimization, restoration, and compensation; however, the plan specifies required mitigation for each category. In sum, then, the Juneau wetlands plan's categorization process is meant to streamline the sequencing procedure, at least for two classes of wetlands.

How Categorization Was Done

The plan ranked each wetland for each of these three factors, as follows:

- To accomplish the environmental component, CBJ hired a nationally

recognized wetlands expert to evaluate environmental functions of the wetlands within the study area (that had previously been identified and mapped by the Corps), using the Adamus Wetlands Evaluation Technique (WET). Field work for the evaluation lasted one year.

- For the public preference component, CBJ surveyed the public preference for wetland parcels of individuals in different neighborhoods of the city.

- For the practicable alternatives component, the city conducted an inventory of non-wetland alternatives for each type of land use.

The categorization process yielded four wetland categories, from A (most valuable) to D (least valuable). There was initial disagreement regarding into which category most parcels fell. The Corps of Engineers, in developing the Programmatic General Permit, re-categorized several C and D wetlands to A or B status. In doing this they applied the standard of ensuring minimal environmental impacts. The result was the following categories:

- Category A included high-value wetlands that could be developed only if there is no net loss of individual functional values in the wetland drainage basin; on-site, in-kind mitigation was required.

- Category B wetlands could be developed only if there is no net loss of aggregate functional values in the wetland drainage basin; mitigation could be out-of-kind, but must be on-site.

- Category C wetlands could be developed if there is no net loss of aggregate functional value; mitigation could be off-site and out-of-kind.

- Category D wetlands could be developed using best management practices; project design must minimize adverse impacts.

Also, there were special categories including:

- Dedicated land—land not available for general development, due to special restrictions (such as wildlife refuge, etc.).

- Enhancement potential wetlands —wetlands with enhancement potential which are suitable for enhancement projects.

Results/acceptance of Categorization

Only 10 percent of the wetlands encompassed by the Juneau plan (approximately 300 acres), were classified as either C or D. Only approximately 12 acres were classified as D, indicating that mitigation would be a strong component of the plan. Originally, the plan called for the CBJ to issue permits for wetlands in categories C and D, following receipt of a Corps' general permit; and for wetlands of categories A and B to continue to be regulated by the Corps by individual permits under Section 404, subject to any additional plan requirements. Applicants for permits in all categories of wetlands (except category D) would be required to comply with mitigation policies contained in the plan, while category D wetlands can be developed using "best management practices" defined in the plan. For impacts less than 5 acres (presumably to category C wetlands and above), applicants would be able to use a proposed mitigation bank operated by CBJ.

CBJ's request for a general permit was held in abeyance by Corps headquarters in Washington, DC. CBJ has been administering permits for C and D categories of wetlands under a special coordinated procedure with the Corps called an "Accelerated Individual Permitting Procedure."[31]

[31] The PGP was issued on June 30, 1995.

Special Characteristics of the Categorization Experience

The categorization experience in Juneau was somewhat rocky. The Corps ended up re-categorizing many lower value wetlands to higher value status. Perhaps the discomfort lay in the inclusion of "public preference for management" as a categorization criterion. The plan also suggests the tension between Federal and local management and permitting activities in wetlands, as illustrated by the legal challenges the plan has faced.

Hackensack Meadowlands, New Jersey

The approximately 8,000 acres of wetlands remaining in the Hackensack Meadowlands are the focus of a Special Area Management Plan (SAMP), which is near completion. This relatively small area is under intense development pressure, given its close proximity to New York City. The Hackensack Meadowlands Development Commission (HMDC) is leading the planning effort with the Corps and EPA serving as the lead Federal agencies.

Why Categorization Was Done

Wetland categorization was felt to be necessary in order to assess environmental effects of different land management alternatives that attempt to balance multiple planning objectives, which include no-net-loss of wetland values. The SAMP features an environmental impact statement (EIS) that attempts to integrate the alternatives analysis required under Section 404 into the master planning process for the Meadowlands. In other words, the SAMP allows the alternative analysis to be addressed during advance planning rather than through individual permit applications (National Wetlands Newsletter, p.8, March/April 1993). The purpose of categorization, therefore, is to accomplish some of the alternatives analysis. Because of this, analysis of different land use planning alternatives is explicitly part of the categorization process. Presumably, different agencies participating in the SAMP will not approve the plan unless they are convinced that alternatives analysis sequencing has been accomplished by the plan, or will still be required from permit applicants.

How Categorization Was Done

The objective of the valuation technique that was developed is to identify and compare wetland attributes with wetland functions. The valuation technique was as follows: wetlands are divided into "cells," up to 100 acres in size. The cells are defined by man-made structural features such as roads, railroad tracks, or utility lines. Each cell is then scored on wetlands functions such as water quality, wildlife habitat, social significance, and floodflow alternatives. The technique is being used in the SAMP EIS to quantify the effects of land use alternatives on each wetland area.

The SAMP and the EIS will identify a preferred land use alternative for each wetland by combining the results of the valuation process above with economic, social, and environmental goals of HMDC. This will in effect result in wetland categories—areas to be protected, restored, and developed.

Results/acceptance of the Categorization

The valuation technique is being used in the EIS to evaluate the effects of different land-use alternatives on wetlands functions. Ultimately, the information will be used to determine the land management alternative that is most suitable to each wetland area. Although the draft EIS is not yet complete, there has been some conflict between HMDC land use decisions and private property owners in the past.[32]

Special Characteristics of the Categorization Process

The situation in the Hackensack Meadowlands differs from other case studies in the degree of

[32] The Draft EIS was issued in July 1995. As of early 1996, the Final EIS is under development.

development pressure on the wetlands covered by the plan, and their high development value. Consequently, land-use designations in the plan are potentially very contentious. Landowners will be very wary of reductions in the value of their property that will result from a plan that restricts development; environmentalists will be reluctant to allow development at all because they claim there are so few wetlands left. Given the degraded state of the wetlands, restoration will likely be a major component of any management plan. There are conflicts of this type with practically all case studies examined; however, the conflict is magnified in the Hackensack case.

Dade Co., Florida (North Trail and Bird Drive Basin)

The Dade County Department of Environmental Resource Management (DERM) spearheaded the North Trail and Bird Drive Basin SAMP. The Corps of Engineers has been a lead Federal agency.

How and Why Categorization Was Done

Presumably, categorization was done in order to develop off-site restoration and trading rules for different types of wetlands. Trading and restoration rules were felt to be needed because on-site mitigation had a poor record of success, apparently due in large part to the persistent invasion of exotic species. North Trail and Bird Drive was an EPA ADID site, and the Corps required the DERM to perform detailed functional evaluations of wetlands using techniques such as the Habitat Evaluation Procedure (HEP).

Results/acceptance of Categorization

The categorization process resulted in the decision that one type of wetlands, tree islands, were off limits to development. However, the results of the categorization processes were apparently not used to differentiate development or mitigation decisions regarding the other types of wetlands in the SAMP basin. Rather, in the end, non-tree island wetlands were lumped together, as mitigation requirements were the same for each. Mitigation decisions did differ depending upon the location of the wetland in relation to the County Comprehensive Plan; i.e., there were different requirements for wetlands within the urban development boundary than outside this boundary. Much of the mitigation was to be done outside the SAMP area, either in the Everglades National Park ("Hole in the Donut" project) or elsewhere in Dade County, precluding the necessity of categorizing mitigation sites in the SAMP area. Thus, in the end, categorization yielded a simple set of rules that permit applicants could follow.

Apparently, categorization has been well-accepted for the most part by all interests. Apparently, developers appreciate the simplicity of having a set mitigation fee apply to all parcels (that are not tree islands). Also, environmental groups have not been opposed to the scheme because they realize the need for active management to prevent exotic species invasions. However, there has been some concern voiced by the Fish and Wildlife Service to have more of the mitigation work done in Dade County, as opposed to Everglades National Park. As a result, one-third of the mitigation fees go towards mitigation work in the County (but not necessarily in the North Trail and Bird Drive Basin).

Special Characteristics of the Categorization Process

The categorization process appears to have gone rather smoothly, for several reasons. First, there is a consensus of opinion that the ecosystem will require active management; protection of existing wetland parcels will not be ecologically beneficial. There was also a perceived urgency to adopt the plan, for the County's master plan requires that a wetland plan (to ensure flood control and habitat protection) must be passed before any development could proceed in an undeveloped area. This led to the cooperation of many stakeholders in getting a plan passed as quickly as possible.

Also, the rejection of using categorization to set up parcel-specific development and mitigation requirements is somewhat unusual. Those

involved with the SAMP apparently felt that the benefits of using simpler mitigation rules (a flat fee, tree islands off limits to development, giving fees to the Everglades Park) was simpler to establishing elaborate, parcel-specific mitigation requirements.

DuPage County

The DuPage County Department of Environmental Concerns (DDEC) is conducting planning efforts that focus on watershed planning and commercial ventures throughout the county.

How and Why Categorization Was Done

A county ordinance established categorization rules for wetlands in the county in order to streamline mitigation requirements and achieve no-net-loss of wetlands. The ordinance established rules by which all wetlands (including non-jurisdictional wetlands) would be categorized as either "critical" or "regulatory," and mitigation requirements for each of the two types (ratio of 3:1 and 1.5:1 acres of wetland impacted versus mitigated, respectively). Criteria by which wetland parcels are to be judged as critical or regulatory include such factors as: identification as critical by an EPA ADID project in the region; presence of threatened or endangered species; a high water quality rating; a high wildlife quality rating; a stormwater storage volume rated above a certain standard; and a variety of other criteria. Designation of wetlands as critical or regulatory is done at the time of permit application, although, in some cases, the designation is likely to be obvious.

Categorization was also done in order to determine appropriate mitigation requirements for regulatory versus critical wetlands, and mitigation requirements are specified in planning documents. Mitigation requirements are basin-specific. Public commercial credit supply ventures are authorized by the plan, but these are subject to the same requirements as individuals that choose to do the mitigation work themselves.

Results/acceptance of Categorization

This effort has apparently been well received by the county and Corps. The Corps has given the county a specific type of general permit to help administer the ordinance, and has recently given a general permit to the county to operate a commercial venture for certain jurisdictional wetlands (previous efforts have been directed at non-jurisdictional wetlands). DDEC staff insist that the plan offers more environmental protection than previously existed, and asserts that the plan has been well received and there have been few takings claims. Many developers have already purchased credits from the commercial ventures, although construction of restoration sites has not yet begun.

Special Characteristics of the Categorization Process

The categorization process is similar to Dade County in that individual parcels are not specifically mapped out for preservation, development, and restoration. Rather, the plan identifies rules by which development and mitigation decisions can be made.

This effort is also unusual in that it evolved from a county ordinance, rather than a Federal program. The overall effort in DuPage County also was directed primarily at stormwater management rather than wetlands management (the plan was not the result of the threat of a Federal permit rejection, as was the case in many of the other case studies). It appears that commercial ventures were ultimately included because DDEC thought they contributed to the plan's overall objectives. The establishment of commercial ventures does not appear to be the motivating factor for the plan.