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WETLAND MITIGATION BANKING: A BANKER'S PERSPECTIVE

By

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ABSTRACT

WETLAND MITIGATION BANKING: A BANKER'S PERSPECTIVE

By

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This research presents findings on the experiences of wetland mitigation bank managers in the United States. Data were collected and analyzed for a project supported, in part, by a Disciplinary Research Grant from the Michigan Agricultural Experiment Station. During summer and fall of 2003, primary data were collected using semi-structured interviews with wetland bank managers responsible for 59 percent of the nation's mitigation banks. A stratified, random sample of potential participants was drawn from 380 wetland mitigation banks. After receiving a pre-notification letter from the researcher, the managers were contacted by the researcher by phone to arrange the interviews. Altogether, 140 interviews were undertaken with mangers responsible for about 250 established or proposed mitigation banks. The semi-structured interviews each took about one-half hour to complete, followed a specially prepared script, used qualitative interviewing protocols, were audio recorded, and were subsequently transcribed. The 140 interviews resulted in more than 1800 pages of transcripts which were sorted and coded by the researcher using iterative data analysis methods including ATLAS.ti software. The result of this analysis is a rich profile of the nation's wetland mitigation bank managers and their banks; manager's backgrounds and professional history and bank information on ecological types, service areas, and credit determination. The study also examined wetland bankers' ideas about keys for success, major obstacles, agency support and possible changes within the banking industry.

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CHAPTER ONE

Introduction of Research Topic

Introduction

For a long time, wetlands in the United States were disregarded as the positive natural resource that many people now understand them to be. Throughout U.S. history, people have dredged, drained and filled the nation's wetlands so that less than 50% of the original wetlands in the country remain (Dahl, 2000). It is expected that as we move through the next century that natural wetlands will continue to be subjected to the increasing pressure of society's continued growth and expansion. Relatively recently there has been a growth in dialogue and understanding regarding wetlands and people's impact on these ecosystems. Scientists are now studying and learning about wetland benefits and the need to protect wetland ecosystems. This relatively new understanding of wetland ecology and its protection has resulted in a struggle within some communities as they continue to grow and expand. The recognition of the value of wetlands as well as the need to grow has spawned the organized regulation of wetlands in this country. This regulation has taken many forms from various congressional acts like the Endangered Species Act (1973) and the Clean Water Act (1972) to local regulation of wetland areas in some areas (e.g., municipal wetlands ordinances). Although there are various types of requirements designed to protect wetlands in this country, one of the newer forms of wetland protection measures is compensatory wetland mitigation.

Compensatory wetland mitigation includes many remedial actions that developers and others seeking to adversely impact a natural wetland area can undertake to make-up for or compensate for the wetland services being lost (Moriarty, 1999). The Michigan

wetland protection statutes (Part 303, Wetlands Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, Section 324.30301 et seq.) as well as the U.S. Army Corps of Engineers and U.S. Environmental Protection Agency (Section 404 of the federal Clean Water Act, 33 U.S.C. 1344) provide for several types of mitigation. One way a developer can mitigate for potential adverse wetland impacts is simply through avoiding the wetland. Another option for mitigation is for the developer to minimize the amount of impacts to a wetland area. A third approach that a developer can employ for mitigating potential wetland harm is "wetland replacement." Such replacement may take place by a developer restoring, creating, enhancing, or preserving wetlands to make up for the wetlands being adversely impacted. If this replacement of wetlands is performed at the site of the development, it is known as on-site mitigation. Off-site mitigation takes place when wetland is created/enhanced/restored/preserved at another locale. Off-site mitigation practices include in-lieu-fee mitigation, project-specific off-site mitigation, and mitigation banking. Wetland mitigation banking is a market-based system of off-site wetland mitigation that has been seen to have some promising characteristics and features (NRC, 2001). This thesis focuses on the study of the nation's wetland mitigation banks.

Statement of the Problem

> Wetland mitigation banking is "the restoration, creation, enhancement, and in exceptional circumstances, preservation of wetlands and other aquatic resources expressly for the purpose of providing compensatory mitigation in advance of authorized impacts to similar resources" (Federal

Guidance for the Establishment Use and Operation of Mitigation Banks. 60 Fed Reg. 228 58605-58614. 1995).

It is a "subset of compensatory mitigation, in which 'mitigation bankers' are awarded mitigation credits by the Corps or a state regulatory program for restoring, enhancing, or creating wetlands" (Sapp, 1995).

Throughout the more than 15 years of mitigation banking development, there have been some studies aimed at understanding how the wetland mitigation banking process functions. Most notably, in this area, has been the work of the Institute for Water Resources (IWR). From 1992 to 1996, the Institute for Water Resources as a part of the Water Resources Support Center of the U.S. Army Corps of Engineers published, in conjunction with various partners, a series of reports as part of their National Wetland Mitigation Banking Study. IWR gathered data, mostly from regulatory agency personal and documents, on how wetland banks were functioning in the United States. IWR's periodic reports provided a view of banking and its development in this country from the perspective of the agencies involved and presented an emerging industry with extensive room for growth and development

In 2002, the Environmental Law Institute (ELI) took over the work begun by IWR and published their report *Banks and Fees: The Status of Off-Site Wetland Mitigation in the United States*. ELI examined how banks function by asking questions about how banking credits are determined and service area delineation. Once again the primary source of data was provided by agency personal and documentation. The work done by ELI and IWR provide a foundation for other examinations into the wetland banking industry (e.g. Scodari, ACOE, 2001; Scodari and Shabman, 2004). Many of these

articles and publications for the general public are discussed further in Chapter Two. Since some studies have already been done, this study examines some of the issues addressed in older studies (for comparison) but focuses on data from a wetland banking source previously not well studied—wetland mitigation bankers. While some studies in the past occasionally mention some interaction with bank managers, previous work has not focused on the experience, knowledge, and insights of those individuals handling the daily credit transactions. Therefore this project, in part, attempts to capture and analyze the experiences and practices of wetland bankers as well as describe the current state of wetland mitigation banking in the United States.

Research Objectives

The first objective of this study is to learn from wetland bankers about some of the issues examined by past banking studies. Doing so will not only allow for updated information but also allow for a comparison of information from the different sources. Secondly, the study seeks to directly document and analyze the experiences and perceptions of those entrepreneurial individuals involved in the actual day-to-day process of wetland banking. Lastly, the study attempts to create a profile of the nation's wetland banks and management process as well as a profile of the bankers themselves.

The focal point for this research is to characterize wetland banking from the perspective of wetland mitigation bank managers, not agency documents or personal. The approach complements those wetland banking studies that have focused on agency personal and documentation. Data from the bank manager's perspective will allow for some degree of comparison of data as well as provide a voice for bank managers. The

primary data collected and analyzed for this study comes from more than 140 interviews with bank managers about their experiences in the industry and their knowledge of their particular bank(s). As a result, it is possible that some information in this thesis may diverge from the understanding of wetland regulatory agency personal.

A unique feature of this study is the use of data gathered in "conversational-style" interviews. The project used semi-structured, open interviews to obtain data of great depth and richness on such topic areas as: banker's incentives, interaction with agencies, keys to success and obstacles found. These qualitative interview methods have been used for years within the social sciences and are generally recognized for leading to rich, in-depth data (Bryman, 1984; Gelling, 2003). While multiple formal hypotheses were not specifically tested in this study, the data were sorted, coded, and analyzed to investigate several research questions concerning mitigation banking. These research questions were formed, in part, by previous studies as well as information that emerged from the iterative analysis of the interviews.

Significance of the Study

As previously mentioned, ELI and IWR interviewed U.S. Army Corps of Engineers (ACOE) district offices as well as state wetland managers but only a very limited number of bank sponsors. That is, previous studies did not collect information about wetland bank sponsors and their experiences in wetland mitigation banking. Therefore, this study addresses an important gap in the understanding of wetland mitigation banks--The experience and perceptions of managers and operators of wetland mitigation banks. These perceptions shed light on such issues as interaction with agency personal and

motivation of individual banks. This study was designed to provide a data collection means that also encouraged wetland bank managers to express their experiences regarding issues such as key obstacles, keys to success and issues they would like to see changed within the industry. It is hoped that the detailed understanding of the status, trends, and experiences of wetland mitigation bankers may help promote improved wetland protection and possibly the protection of other natural resources.

Organization of the Study

This thesis is organized in five chapters – Introduction, Literature Review, Research Methods and Procedures, Data Analysis and Results, as well as Conclusions and Recommendations. Chapter Two discusses and reviews the scholarly literature regarding wetland history and policy as well as wetland mitigation banking in the United States. Chapter Three focuses on the research design including: methods, study population, sampling, and data collection. Chapter Four presents and analyzes the collected interview data, and Chapter Five discusses some implications of the findings, conclusions, limitations and recommendations for further study.

CHAPTER TWO

REVIEW OF THE LITERATURE

Introduction

Wetlands are unique and diverse ecosystems which have the capacity to provide numerous bio-physical functions for plants and animals as well as many benefits for mankind (Gaddie and Regens, 2000). It is only relatively recently that wetlands have been studied as a separate ecosystem. Wetlands have not always been recognized as diverse and important ecosystems. As the world population has grown the need for further economic growth and land resources has also increased (Etchart, 1995). The historic need for economic growth has, in part, led to a disregard for wetland functions and diversity in the United States (Brown and Lant, 1999). In fact, public concern for wetlands in this country has a relatively short history. For numerous years, public attitude as well as government policy encouraged the destruction of wetland habitat (Marshall, 2000). However, the former destructive view towards wetlands has slowly begun to change in more recent times. With policies such as the Clean Water Act, Section 404 (Federal Water Pollution Control Act, Public Law 92-500), the United States has slowly advanced the development of various wetland regulations. This chapter describes briefly wetlands and their functions and then presents a short history of wetland regulation. The chapter continues with an examination of the development of the wetland banking industry. The chapter concludes by highlighting some issues faced within the wetland banking industry.

Wetland Ecology; Functions and Services

Wetlands are characterized by many features including: vegetation, hydrology, water chemistry, origin of water, soil types, landscape position and landform, wetland origin, wetland size, and ecosystem form/energy sources (Tiner, 1999). All of these features are important individually and in concert in the study of overall wetland functions (Reenstierna, 1980).

Wetlands provide habitat to large ecosystems of aquatic and waterfowl populations (Hey and Philippi 1999). In fact, as discussed later in this chapter, it was the desire to protect waterfowl that first brought about wetland protection in this country. Wetlands support great biodiversity including large numbers of federally listed threatened or endangered species (Gaddie and Regens, 2000). Wetlands also provide benefits to society via such services like flood control, maintenance of water quality, and recharge of ground water.

Wetlands also provide water quality functions and services. In some instances, wetlands also allow for water to percolate into aquifers underground which store and clean water for human use (Hey and Philippi, 1999). Erosion prevention is also supplied by wetlands through the slowing down of water energy as well as allowing for the establishment of wetland plant communities (NRC, 1995). Water pollutants are also absorbed and filtered out by well-functioning wetland ecosystems (NRC, 1995). Wetlands also contribute to the support of a multi-billion dollar fishing, hunting and outdoor recreation industry nationwide (WWF, 1992).

The economic value of wetland functions such as flood control, is often more difficult to calculate (Prince, 1997). In 1987, an estimated $120 million in damages occurred to a

few thousand residents living within DuPage County, Illinois (WWF, 1992). This county has less than one percent of its original natural wetlands and the absence of wetlands in the county resulted in the building of structures to divert floodwaters estimated to cost the taxpayer 100 million dollars (WWF, 1992). One estimate of the global value of wetland resources is 14.9 trillion dollars, which accounts for 45 percent of the value of all natural ecosystems (Ducks Unlimited, 2001).

Early History of Wetlands in this Country

Early European settlers in North America recognized the value of wetlands just like Native American Indians seeing marshy lands providing waterfowl and seafood as well as 'sea hay' for harvest for their animal feed (Vilesis, 1997). However the need to expand development soon brought the need to drain natural wetlands and in 1788 settlers on the East coast received legal backing to drain wetlands by the New Jersey legislature's first drainage law.

The need to expand coupled with new drainage technology quickly allowed for a population explosion with the U.S. population increasing 300% from 1820 to 1860 (Hey and Philippi, 1999). By 1862, the year of the Homestead Act, almost all of the land in Ohio, Illinois, Indiana, and Iowa was already claimed bringing the need to convert wetlands further westward (Prince, 1997).

It was the Louisiana Swamp Land Act of 1849 that transferred ownership of federal swamplands to states in the lower Mississippi River Basin allowing states to sell the swamplands within their borders to generate funds necessary for drainage and levee building (Vileisis, 1997). This act was the official birth of our nation's drainage districts.

Similar swampland acts followed for various states with most of this draining being done to produce agricultural lands. States with large amounts of wetlands, such as Illinois, Michigan, and Florida, where only half the land was considered suitable for farming, joined a general move to have federal swamplands ceded to them. This national desire to drain wetlands led Congress to pass the Swamp Land Act of 1850 (NRC, 1995) and the affect was very successful. "Between 1870 and 1920 drainage districts drained more than 48 million acres and between 1945 and 1965 another 24 million acres were drained by districts, bringing the total up to 64.33 million acres" (Hey and Philippi, 1999). From the colonial period to the 1980's the amount of wetlands in the contiguous United States decreased by about 50% (Whitsitt, 1997). "During the drainage campaign that reached its peak at the end of the nineteenth century, Illinois and Iowa lost ninety percent of the original wetlands: California lost ninety-five percent" (Freyfogle, 1995).

History of Wetland Protection in the United States

Wetland protection has historically been linked to other types of protection in this country (Gaddie and Regens, 2000). In the late nineteenth century Federal and state governments, as well as private organizations, started to acquire wetland areas as waterfowl sanctuaries (Schenck, 2000). These acquired areas include what is now known as The National Wildlife Refuge System, which was designed to protect habitat for migratory birds (NRC, 1995). The Federal Duck Stamp Program of 1934 provided money for the purchase or protection of wetlands (Schenck, 2000). But it was the Rivers and Harbors Act of 1899 that was really the first official wetlands protection law in this country with section 10 of the act prohibiting the dredge or discharge of material in the

navigable waters of the United States without a permit from the U.S. Army Corps of Engineers (Marsh, 1996).

The National Environmental Policy Act (NEPA) of 1969 further expanded the scope of the Corps's jurisdiction to include wetlands (Neal, 1999). But Section 404 of the Clean Water Act eventually had the most effect in protecting wetlands (Gaddie and Regens, 2000). "The Clean Water Act was enacted to restore and maintain the chemical, physical, and biological integrity of the nation's waters" (Marsh, 1996). Section 404 states that it is unlawful to discharge dredged or fill material into United States navigable waters without permission from the Corps of Engineers (Federal Water Pollution Control Act, Public Law 92-500). Section 404 does allow developments that have minimal adverse impacts and disfavors larger projects that have 'practicable alternatives' (Karkkainen, 1997).

The Clean Water Act requires permits for dredging or filling of wetlands with certain guidelines to follow. The (b)(1) guidelines state that 'no discharge of dredged or fill material shall be permitted if there is a practical alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem" (Marsh, 1996). Practicable alternatives are presumed to exist if the proposed development is not dependent on water (Marsh, 1996). These guidelines, established by EPA with later revision, were finalized in 1980 (Sutton, 1998). The 404(b)(1) guidelines dictate that the Corps requires applicants to provide documentation that there are not practicable alternatives to the proposed project. In other words, a permit cannot be issued if there are alternatives that would have a less adverse impact on the aquatic ecosystem and that steps have been taken which will minimize adverse impacts on the aquatic ecosystem.

Sequencing Guidelines for Mitigating Wetland Impact

In 1990, the Corps wrote a Memorandum of Agreement (MOA) describing the type and level of wetland replacement or mitigation that would be needed to comply with Section 404(b)(1) guidelines (Siverstein, 1994). Under this MOA, a three-part process or "sequencing" was designed to help with wetland mitigation decisions. The sequencing guidelines set up by the EPA and followed by the Corps of Engineers include the following steps:

1. "Avoid - "No discharge shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact to the aquatic ecosystem" (EPA; Corps, 1990)
2. "Minimize – If impacts cannot be avoided, steps must be taken to minimize the adverse impacts through project modifications and permit conditions" (EPA; Corps, 1990)
3. "Mitigate – "Appropriate and practicable compensatory mitigation for unavoidable adverse impacts which remain after all appropriate and practicable minimization has been required" (EPA; Corps, 1990)

Wetland Mitigation what is it and how it works

As mentioned, the objective of the Clean Water Act is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters" (Federal Water Pollution Control Act, Public Law 92-500). Unless a permit is issued under Section 404 of the CWA, the Act prohibits the discharge of dredge or fill material into waters in the United States. The Clean Water Act is administered by the U.S. Army Corps of Engineers or, if a state has U.S. Environmental Protection Agency approval, the CWA can be administered by a state program. There are currently only two states with such approval, Michigan and New Jersey (Gaddie and Regens, 2000). With the administration of the CWA, the Corps or state agency has the authority to issue section 404 permits

following the sequencing guidelines, and they also have the authority to attach any conditions to the permits.

There has been some concern regarding the compensatory nature of wetland mitigation over the years. This concern is based on the fact that in many instances promised wetland mitigation never actually has been undertaken (NRC, 2001). Furthermore, wetland mitigation failures have occurred and have been blamed on poor hydrology and vegetation (Lindquist, 1997). These concerns, among other things, have given rise to interest in the possible benefits of wetland mitigation banking.

Development of Wetland Mitigation Banking

Wetland mitigation is one way to try and balance the pressures from an ever growing population with natural resource protection. The idea to protect wetlands through a market-based system underlies the concept of wetland mitigation banking (Salzman and Ruhl, 2000). The concept of banking goes back to the mid 1970s but it was the 1990 MOA sequencing guidelines that made the industry a reality (Hart, 1995). As discussed, if a developer wishes to impact a wetland he/she must avoid, minimize and eventually replace the wetlands to be impacted. The replacement of wetlands is the sequencing step of mitigation that gives rise to the possibility of wetland banking. The replacement of wetlands can take on various forms; the wetlands can be replaced on the same location as the proposed project and wetland impairment (on-site mitigation), the replacement wetlands may be, in some cases, be provided at a location distant from the protect site (off-site mitigation), and in some casers the replacement wetlands may be provided based on credits for wetlands in areas already constructed, enhanced or preserved (Veltman,

1995). This later type of mitigation activity, free market 'buying into' wetland areas that already exist, is the central concept underlying wetland mitigation banking. While the 1990 MOA set the stage and framework for wetland mitigation banking, wetland banking did not flourish in the early 90s because of high costs and uncertainties in creating wetland banks that would serve as the source of wetland mitigation credits (ELI, 2002).

Uncertainty in Mitigation Banking

When wetland mitigation began, there were many uncertainties concerning the absence of suitable definitions of banking and its component parts as well as uncertainty about its potential benefits to developers, agencies and entrepreneurs. As a result, in November 1995, the Corps, EPA, Fish and Wildlife Service (FWS), Natural Resource Conservation Service (NRCS), and the National Oceanic and Atmospheric Administration (NOAA) published the Federal Guidance for the Establishment, Use and Operation of Mitigation Banks. This publication defines mitigation banking as,

> "the restoration, creation, enhancement and in exceptional circumstances, preservation of wetlands and/or other aquatic resources expressly for the purpose of providing compensatory mitigation in advance of authorized impacts to similar resources. Mitigation banking is authorized for use when on-site compensation is either not practicable or use of a mitigation bank is environmentally preferable to on-site compensation" (Federal Guidance for the Establishment Use and Operation of Mitigation Banks. 60 Fed Reg. 228 58605-58614. 1995).

Since wetland mitigation banking began, there have been several articles on its use. Some authors voiced concerns that banking would allow 'permit selling' (Sokolove; Huang, 1992). Other articles address the possibility that some private wetland bankers profit on wetland protection (Gentry, 2001; Moriarty, 1999). Focusing solely on these types of publications, it is easy to see how one might perceive wetland banking as only a money making activity of permit selling.

Recently, the issue of what types of wetlands and wetland activities are subject to mitigation requirements has introduced more uncertainty in wetland mitigation banking. In 2002, a U.S. Supreme Court decision in a case involving a Chicago consortium wanting to use an abandoned sand and gravel pit as a solid waste disposal site changed how wetlands are protected and regulated in this country (Solid Waste Agency Of Northern Cook County v. United States Army Corps Of Engineers, et al., 531 U.S. 159; 121 S. Ct. 675; 148 L. Ed. 2d 576 (2001). The site had, over the years, developed into a wetland that supported migrating birds. The U.S. Supreme Court reversed the decision denying the developers a 404 permit by interpreting the Clean Water Act's language defining wetlands so that "waters of the U.S. only included navigable waters, their tributaries and wetlands that are adjacent to these navigable waterways and tributaries" (Solid Waste Agency Of Northern Cook County v. United States Army Corps Of Engineers, et al., 531 U.S. 159; 121 S. Ct. 675; 148 L. Ed. 2d 576 (2001). This decision effectively reduces the protection of isolated wetlands under section 404 of the Clean Water Act because it limits what can be viewed as a wetland subject to federal protection and regulation. This, in turn, may impact the wetland banking industry by reducing the number of projects needing mitigation as a result of Section 404 permits.

Advantages of Mitigation Banking

Mitigation banking may have had some uncertainty in its development and use but the approach has seemed to work well in some areas. Some of the advantages associated with wetland mitigation banking include consolidation of wetland mitigation activity, and pooling of financial resources and scientific expertise. Wetland mitigation banks typically consolidate compensatory mitigation into larger tracks of land thereby reducing the number of small 'postage-sized' mitigation sites. This is beneficial because the larger tracts tend to provide better habitat and wetland services and many small wetland mitigation projects have failed because of non-continuous hydrology. Wetland mitigation banks can also provide opportunities to provide financial resources and planning and scientific expertise to developers needing project-specific compensatory mitigation. There are some who believe that wetland banks have also been known to reduce permit processing time and are able to provide more cost-effective compensatory mitigation opportunities (IWR, 1993). Mitigation banks may also be seen as providing wetlands and wetland services in advance of a permitted wetland impact, which reduces the time lag between a wetland loss and the replacement of lost wetland services. Mitigation banks may also make regulatory oversight easier, freeing regulatory agencies from reviewing and monitoring numerous small mitigation projects. In general, some argue that wetland mitigation banks may provide a important contribution towards the nation's goal of having 'no net loss of wetlands' (Haynes and Gardner, 1993, Whitsitt, 1997, Veltman, 1995).

Wetland Mitigation Banking – Takings and Preservation

Since approximately seventy-five percent of wetland areas in the continental United States are privately owned (Gardner, 1996) increased federal regulation of our nation's wetlands and therefore permit denial has produced increased numbers of takings cases based on claims that government regulations deny all economically beneficial use of private property. The relatively new idea of wetlands mitigation banking in the early 1990s brought to the forefront an interesting solution to the issue of government regulatory takings. If additional options for wetland mitigation are available, overall the Corps may have to deny fewer permits. Also if mitigation banks are economical viable, then a parcel with wetlands may be thought of as a potential wetland bank and a permit denial is less likely to destroy all economic value of that property (Gardner, 1996). This option opened the door on discussions of whether preservation should be used for mitigation banking credit. Many feel that offering the option of preservation of wetlands for mitigation banking credit does not produce the 'no-net loss' objective set by the Bush administration. However, it may be easier to create "new" wetlands on sites with extant wetlands. Some believe preservation of intact wetlands for mitigation banks better serves the public's general goals of preservation because wetland preservation programs cost taxpayers hundreds of millions of dollars (Ratner, 1994). Advocates of the preservation of wetlands for credit issue like William Haynes of the Environmental Law Reporter argue that:

> "Affording credit for preservation is necessary if the government is to derive the benefit of protection from taking claims. It will be high-value wetlands that are preserved, and these are the wetlands most likely to be involved in a permit denial. Ensuring that there is economic value in keeping an environmentally valuable wetland in its natural state is essential to protecting private property

interests and the regulatory program from an onslaught of takings cases" (Haynes, 1993).

Because of taking cases and the issue of preservation of existing wetlands it is expected some bank managers will have created banks and possibly even speak of increased economic use of their 'wet land'.

Mitigation Banking and the Federal Highway Administration

The construction of highways and roads typically involve significant wetland loss. In 1988, Pub. L. No. 105-178: the Transportation Equity Act for the 21st Century (TEA-21) was signed into law. This Act endorsed the use of wetland mitigation banks in transportation projects (Neal, 1999). The 1991 Intermodal Surface Transportation Efficiency ACT (ISTEA) made the costs of wetland mitigation banks built for transportation projects eligible for federal aid highway funds (ELI, 2002). Because wetland banking had been shown to provide benefits in mitigating wetland loss, the Federal Highway Administration (FHWA) became involved in wetland mitigation banking. The majority of wetlands banks in the early 90s were developed by public agencies to meet transportation needs (Hart, 1995). Because of wetland banking has a long history with transportation, it is expected that many wetland banks will be found to be used for transportation project mitigation needs and that many wetland bankers will be concerned with transportation needs and issues.

Wetland Mitigation Banking and this Study

Wetland protection in this country has undergone extensive changes throughout the last few decades. Studies have examined wetland mitigation banking through the years –

most notably IWR (1993) and ELI (2002). A recent study in Florida by the U.S. Army Corps of Engineers continued the tradition of focusing on regulatory agency personal and agency documents as the source of data (Scodari, ACOE, 2001). In all of these studies, the primary information sources on wetland mitigation banking have been agency personnel and banking documents. It is the intention of this study to examine some of the same issues developed by IWR and ELI from the point of view of the wetland bank managers themselves. The study will address such questions as credit determination and service area delineation. This study will also directly question bank managers and give them and their perspective a voice regarding wetland mitigation banking.

Some questions raised by this study and not previous addressed will include things such as keys to successful wetland banking, obstacles faced by bankers and things they would like to change about banking. It is expected that some differences will be seen between the issues in this study and the studies from the ELI and the Florida Corps study. These similarities and differences may shed light of previous studies as well as help interpret the results obtained. It is true many experiences of bank managers can not be predetermined or hypothesized. Therefore it is the intention of this study to use a research plan designed to learn in-depth about wetland bank managers' experiences. The goal is an honest depiction of the wetland banking industry and its bank managers.

CHAPTER THREE

METHODS AND PROCEDURES

This chapter's three primary sections address the general research methods, the implementation procedures, and the analytical procedures used to achieve the research objectives. Each section describes in some detail steps used to collect primary data from the nation's wetland mitigation bank managers about their mitigation bank experiences and wetland mitigation banking in general.

Methods

Introduction

This section presents the general methods used to achieve the research objectives including reanalyzing issues raised in previous studies using information gathered directly from the nation's wetland bankers. The choice and adequacy of research methods must consider not only the methods used for obtaining knowledge but also the nature of knowledge and the nature of the phenomena to be investigated (Morgan and Smircich, 1980). Qualitative methods are most often associated with phenomenology "which seeks to focus upon the lived experience of people" (Bryman, 1984). Because this study targeted the experience of wetland bank managers, qualitative research methods were deemed appropriate. A quality of qualitative research is that it can be flexible and may provide means to access and generate discussions with key decision makers in organizations and industry experts (Write, 1996). Since wetland mitigation bank managers are usually the key decision makers within their bank, qualitative

approaches seemed viable as ways to access to these individuals and obtain the desired data.

Survey Instrument; Open or Closed

The use of a written, close-ended questionnaire was also considered as an alternative to a qualitative research method. However, as Howard Schuman and Stanley Presser (1979, 693) have pointed out in their research on survey questionnaires, closed questions "may fail to provide an appropriate set of alternatives meaningful in substance or wording to respondents" and that "respondents are apt to be influenced by the specific closed alternatives given, and that therefore a more valid picture of respondent choice is obtained if they must produce an answer themselves" As Schober and Conrad (1997) put it, "standardized wording may decrease response accuracy because it prevents the conversational flexibility that respondents need in order to understand questions as survey designers intended." An alternative to closed-ended survey questions is the use of open-ended questions. Schuman and Presser (1979) found that 60% of open responses fell outside of 5 pre-determined closed responses. Knowing the nature of this study was the discovery of wetland mitigation banker's experiences, it was decided that a closed-ended questionnaire would be less than ideal as a primary data collection method. Similarly, the use of a written questionnaire with open-ended questions was deemed to be problematic since determining the meaning of respondents' answers would be difficult and use of a written questionnaire would not allow for meaningful follow-up questions. Therefore, the use of some type of more qualitative inquiry was studied.

Open Survey Methods

There are several different types of qualitative research methods and the appropriateness of their use depends upon the type of respondents and the information sought. Participant observation examines complex social relationships (Bryman, 1984). This method allows for reporting of what a researcher sees people do, say or feel. The research conducted in this wetland banking study, while possibly having some limited elements of participant observation of bank managers speaking about their experiences, did not rely upon participant observation. The few participant observations were based on the telephone conversations with bankers and the focus of the study was not deep social relationships.

Qualitative research can also include an examination of various sources of primary data such as documents, files and other paper records (Strauss and Corbin, 1998). This type of qualitative data collection on wetland mitigation banks has been done to some extent by organizations such as ELI (2002) and the Army Corps of Engineers (2001). Therefore, it was decided to examine another data source for the study. Since this research hoped to explore banker's experiences with wetland mitigation banks, it seemed apparent that qualitative interviews should be implemented. As Britten (1995, 252) points out:

> Qualitative interviews try to be interactive and sensitive to the language and concepts used by the interviewee, and they try to keep the agenda flexible. They aim to go below the surface of the topic being discussed, explore what people say in as much detail as possible, and uncover new areas or ideas that were not anticipated at the outset of the research.

Type of Qualitative Interview

Although qualitative interviews of some kind seemed in order, there are many types of qualitative interviews that might have been used for the project. Nicky Britten (1995) describes the universe of qualitative interviews as being made up of three main types--structured, semi structured, and in-depth interviews. There has also been controversy over the use of these varying types of interviews with proponents of the more flexible interview arguing that "the rigid adherence to survey scripts jeopardizes validity because there is no guarantee that all respondents will interpret questions the same way" (Schober and Conrad, 1997). Since this wetland banking research hoped for open free opinions of bank managers on certain issues, heavily structured interviews were decided to be too focused and not free enough to allow for rich, honest, and free-ranging responses. However since this research makes no attempt to probe in-depth into manager's feelings and form theory on these insights, it was decided that in-depth interviews would not be useful. However, since mitigation bank managers might be more inclined to reveal more information in a conversational-type interview and since there was a desire for increased flexibility, the decision was made to use semi-structured qualitative interviews.

Semi-Structured Qualitative (Flexible) Interviews

A benefit of the conversational-type interview (also called semi-structured qualitative interview and flexible interviews) is that a sense of trust can develop between interviewer and respondent (Write, 1996). Respondents are able to freely, in their own words, answer questions and can thus provide researchers with a great deal of information (Converse,

1984). Lazarsfeld (1944) points out that in order to get a reasonable idea of people's complaints a rather detailed discussion is necessary and the open interview is a good device to obtain such detailed information. Schober and Conrad (1997, 584) describe such interviews as follows:

> The flexible interviewers were trained to read the question exactly as worded (just as standardized interviewers do), but then they could say whatever they wanted to assure that the respondent had understood the question as the survey designer had intended. This included reading or paraphrasing all or part of a question, reading or paraphrasing all or part of a definition, and asking questions of the respondent to elicit information so that the interviewer and respondent could jointly reach a correct response. Interviewers could intervene at the respondent's request or voluntarily; that is, interviewers were licensed to intervene whenever they thought the respondent might have misunderstood the question.

The wetland banking study did develop and follow a discussion guide of core issues pertinent to wetland banking and the research. In keeping with semi-structured qualitative interviewing methods, there were relatively few highly structured questions [see Appendix C]. Due to this open, flexible method, the order and wording of the actual questions and topics discussed varied during each interview based on the respondents' answers to previous questions. This is normal for flexible interviewing. "Wording can not be standardized because the interviewer will try to use the person's own vocabulary when framing supplementary questions" (Britten, 1996). Furthermore, the nature of flexible interviewing is that the research is able to follow and use the flow of

respondents' thoughts and information to conversationally raise topics of interest to the researcher (Miles, 1979).

The very nature of qualitative research, including flexible interviews, leads to the discovery of information and topics during the process, especially as the researcher becomes more familiar with the topic being discussed (Britten, 1996). This was true during the interviews with wetland mitigation bankers. Even with extensive research into the industry and policies of wetland mitigation banking, there always seemed to be new issues or topics that emerged from conversations with managers.

Issues of Potential Bias

Qualitative research, including flexible interviewing, does raise some research concerns because of its personal nature. The most predominate problem associated with qualitative interviews are concerns of bias-both researcher bias and participant bias (Schober and Conrad, 1997). However, Gelling (2003, 21) points out that such biases can be overcome by "carefully selecting participants, emphasizing issues such as honesty, anonymity and confidentiality, and by establishing a trusting relationship between the researcher and the participant." Therefore, the wetland mitigation banking study addressed potential bias concerns by using pre-interview communication, informed consent procedures, and a conversation style interview grounded in an interview guide. For example, if during an interview a question of confidentiality or anonymity was raised by the respondent (after they had given informed consent), the respondent was reminded that the procedures and protocols of the study would be followed strictly, that there would be no association of their answers with their name or program name, and that

confidentiality would be maintained to the maximum extent under the law. These types of open and honest interactions between the subjects and the researcher appeared to foster a trusting relationship between researcher and participant and thus helped reduce and avoid bias.

Respondents' Questions and Maintaining Focus

An issue often involved in qualitative interviews whether focus groups or individual interviews is the questioning of the interviewer by the interviewee. Typically, the conversational nature of the interview leads to respondents who either try to steer the conversation away from the researcher's intended direction or respondents who begin to ask questions about the research and the researcher. These respondent behaviors interrupt the flow of the session and potentially introduce bias based on the interviewers' responses. Use of redirecting, neutral prompts are one way interviewers can get the interview back on track. Britten (1995) suggests asking respondents to save their questions until the end of the interview. For the wetland banking project, participants questions were answered during the informed consent phase and, if they were to clarify the interviewer's questions, during the interview session. Otherwise, all other respondent questions were "saved" until the end of the interview. At that point, the interviewer addressed those questions in appropriate ways.

Reliability

The concept of reliability, in the context of quantitative interviewing, refers to 1) the consistency of a subject's response, and 2) the consistency of the analyst's rating of that

response (Winch and More, 1956). To promote researcher reliability, this study used the same researcher to implement all the interviewers, code all the data, and conduct the analysis. The same general techniques were used for every respondent interviewed. The various techniques and their implementation were supervised by the researcher's major professor and approved by her advisors.

To address concerns about the reliability of the data itself, the researcher 1) tape-recorded all interviews, 2) transcribed the interviews, 3) used an iterative, evolving discussion guide, and 4) asked respondents to explain their responses and repeat/confirm their previous answers. The initial interview of a small subset of the universe of wetland mitigation bankers used the first iterative design of the study's discussion guide. These sessions were reviewed, respondent's answers analyzed, and minor modifications to the discussion guide were made. Such an iterative process enable the researcher to identify strengths, weaknesses, redundancies, and needed changes in the interview guide so that the questions used would lead to reliable results. In total there were 4 minor changes in the interview guide. The changes facilitated more reliable responses. (See Appendix D for various forms of the discussion guide)

Validity

Validity in qualitative research is, "the high degree of consistency in the answers of each group indicated that the method provided for an adequate description of each position" (King, 1944, 60). Therefore looking for consistency among responses might provide a measure of validity. The internal consistency of most respondents' answers evidence some measure of internal validity. That is, most often respondents volunteered

the same information about subject matter when asked about it in more than one question or in more than one way.

Regarding external validity, qualitative researchers typically adopt a strategy of triangulation. Denzin (1978, 291) defines triangulation as "the combination of methodologies in the study of the same phenomenon" Jick (1979, 602) points out that "more than one method should be used in the validation process to ensure that the variance reflected that of the trait and not of the method." Since most research regarding wetland mitigation banking has used methods based on agency personnel and documents, it was possible to attempt triangulation with these various sources of data and methods. The 2002 ELI study and a 2001 Army Corps of Engineers study done on wetland banks and bankers within Florida (Scodari, ACOE, 2001) were used to triangulate this study's results. Both of those studies will allow for a certain degree of validation through triangulation of results.

Accuracy

The degree of accuracy of responses in conversational interviewing has been raised as a potential issue for qualitative research. Schober and Conrad (1997, 588) show that "flexible interviewing led to superior accuracy when it was not obvious to respondents how the questions corresponded to their circumstances." This supports the decision to use the semi-structured, flexible interview method for this study. Furthermore, Schober and Conrad (1997, 589) demonstrate that even if interviewers provided "inaccurate information it did not necessarily lead respondents to produce incorrect answers." Once

again, these factors support the reasonableness of adopting the qualitative interview method for this study.

Time

In general, and in the case of this study, flexible, semi-structured interviews take a great deal of time. This is especially true when extra care is taken to reduce bias, increase reliability, and generate accurate and valid data. For example, the interviews in the wetland banking study were designed to last approximately ½ hour. However, it was common for many respondents to go into much greater depth than imagined and for interviews to last upwards of an hour.

Implementation Procedures

University Committee for Research Involving Human Subjects

Since this research used human subjects to collect data, it was necessary to obtain approval from Michigan State University's University Committee for Research Involving Human Subjects. The study titled "Learning About Wetland Mitigation Banks" was assigned IRB number 03-305t. The project initially applied for approval in March 2003 and received approval to begin collecting data on April 17, 2003. The IRB approval was renewed in February of 2004 with an approval expiration date of January 13, 2005.

Sample Selection

The universe of existing wetland mitigation banks in the United States was identified throughout the course of 2002 using published and unpublished research as well as contacts with individual district offices of the U.S. Army Corps of Engineers. The result of this effort was a list of 380 wetland banks complete with bank name, ACOE district, bank sponsor, and sponsor's contact information.

It was not feasible to interview every wetland bank manager in the United States. Therefore, a sub-sample of the nation's wetland banks was needed. It was decided that a stratified random sample by State of 146 wetland bank managers in the lower 48 states of the United States would be more than sufficient. This was the largest number of interviews thought possible given the contrasts of time and money allocated for the project.

The master list of list wetland banks and their managers revealed that not every state had wetland mitigation banks and that some states had as many as 78 wetland banks. Since a random, proportional selection of wetland banks might lead to no banks or only one bank being selected in those states with few banks, it was decided to over sample mitigation banks and bankers in those states with 5 or fewer wetland mitigation banks. Twenty-five states with wetland banks had 5 or fewer banks. In those cases, the researcher attempted to contact and interview all bank sponsors in the state. Mitigation banks and bankers in the remaining 9 states with greater than 5 banks were randomly sampled based on the proportion of wetland banks in their state.

Random numbers were generated, assigned to each wetland bank in the master list and used to select the wetland banks/sponsors for the study. Some attempt was made to

increase heterogeneity of bank type in a state's sample. For example, if it was obvious that a particular state's initial random sample were all private wetland banks, an attempt was made to replace the last selection with the next random selection of a wetland bank of a public type. Also, several wetland banks were managed/operated by the same manager/sponsor. In those cases when a particular manager/sponsor had already been interviewed for the project, the wetland bank/sponsor next in the order of random selection was selected.

Pre-notification letter

Once the sample for study was finalized, each potential participant on the sample list was sent a pre-notification letter via first-class mail informing them of the project, asking them to participate and letting them know that they would be receiving a telephone call from the researchers in the near future (See Appendix A for a copy of pre-notice letter). The pre-notification letter was sent to potential respondents at least 10 days prior to the researcher's first attempt to call the potential participant.

Informed Consent and Audio Recording

After having sent the pre-notification letter, the researcher called potential participants, described the study, and asked for their informed consent to participant in the study (See Appendix B). Consent was either granted or not granted for the interview and for audio-recording using a Dictating/Transcribing System [Memo-Scriber TRC-8800]. All together, 145 persons were successfully contacted with 142 consenting to interview and taping, 1 contact consented to the interview but not taping, 1 contact chose

to give written responses, and 1 contact did not consent to participate. Two potential participants of the 142 consented to participant but, in short order, turned out not to be wetland banks or bankers. This resulted in 140 interviews that were able to be used in this study.

Telephone Interviews and Transcriptions

One hundred forty five (145) telephone interviews could not be done by one person at one time. Therefore, multiple waves of telephone interviews were conducted. Each wave included the selection of the next unit of potential interviewees, the mailing out of pre-notification letters to them, and the subsequent initial telephone contact calls. The initial telephone contact would often result in the scheduling of a subsequent date and time for the interview. On occasion, the initial telephone contact led right to the interview. The first two waves only contained three wetland mitigation bank managers to allow for a period of instrument testing and modification. After this initial period, each wave of telephone interviews contained 20 potential respondents with a new wave occurring every two weeks or so.

Telephone interviews can have some limitations. These include coverage error (not being able to reach all representative respondents by telephone), sampling error (over sampling clusters), non-response error (respondents not wishing to participate) , and measurement error (respondents less confident or correct in answering perhaps due to 'social distance') (Groves, 1990). Such limitations were accounted for by repeated attempts to reach managers, paying particular attention to the stratified sampling frame,

and by trying to gain the confidence of managers through conversational interviewing techniques.

The Instrument

The discussion guide was originally developed by the researcher using an iterative process and peer-review. However, the interview guide underwent various revisions and additions as more information was learned from bank managers themselves. The purpose of the discussion guide was to insure that the same questions/themes/topics were asked of each respondent while, at the same time, allowing for flexibility (See appendix C).

The research was interested in learning generalities about the individual wetland banks including size and type as well as specifics about the manager's experiences. Therefore the questions were detailed in certain theme areas and more general in others. For example, one question provided an opportunity for bank managers to describe their wetland bank, location type and size. This question was intentionally left vague so that managers could discuss their bank in their own words. This was also the case with the question regarding wetland credits. These initial questions were open to allow bankers to use their own words in describing the credit system in their bank. However, the researcher followed-up seeking specific information such as credit price and credit determination during the interview. Bankers also were asked about their background and training as well as their interaction with agencies. The discussion guide questions can be found in Appendix C.

Discussion Guide Revisions

As mentioned, the discussion guide used went through a series of minor revisions. The initial interviews were used to gather the researchers' observations as well as suggestions and feedback from the initial participants for modification of the discussion guide. Some questions were not clearly understood by any participant and their wording was changed or, in one case, a question was eliminated. The original question, "The words wetland bank and wetland banking program can mean a number of things. Can you tell me what these words mean in your experience?" proved too confusing to respondents. The interviewees too often needed excessive clarification and explanation of what was sought. Because respondents discussed the attributes of their wetland banks in response to other questions, the problematic question was dropped from the discussion guide.

The initial discussion guide changed by adding questions after the preliminary interviews and the suggestions and inquires of initial interviewees. For example, some bank managers were interested in learning more about differences across banks using functional assessment methods and those using acre-based methods. Therefore, this question was added to the discussion guide. As Britten (1995) pointed out, new information was learned from the interviews and could subsequently be incorporated into future interviews. Throughout the course of the interview process the discussion guide went through one initial revision and four subsequent minor revisions. The various iterations of the discussion guide can be found in Appendix D. There were a total of five versions of the discussion guide with each version being used in 13, 10, 7, 50, and 60 interviews respectively.

Debriefing Section

Following each interview, the interview guide called for the interviewer to debrief and record impressions, highlights, and other observations about the interview as well as particularly interesting and notable comments made during the discussion. For example, the debriefing section was used to note if individuals seemed hesitant about particular questions or if they did not want to be contacted further and to highlight key points or comments so that they could be recorded for easy reference.

Analytical Procedures

Introduction

The data collection methods used resulted in both the researcher's hand written notes from the interviews and high-quality audio recordings from virtual all of the interviews (139 of 140). These audio recordings were transcribed into electronic documents (i.e., text files) for subsequent use in word processing software (e.g., MS Word © and data analysis software (e.g., ATLAS LI ©). There were more than 1800 pages of transcripts that resulted from the interviews. To best handle this volume of data and the complexity of emerging themes, the research made use of computer-assisted analysis. Podolefsky and McCarty (1983, 886) point out that, "In the abundance of information [within in-depth interviews], the absence of an adequate data management system, tends to confound the analysis and obscure important information." After reviewing several qualitative data analysis software programs including QSR Nudist ©, HyperRESEARCH ©, and QDA Miner ©, the researcher selected ATLAS LI © analytical software (ATLAS)

for use in this study. ATLAS proved readily available at Michigan State University, flexible, and very user-friendly.

Analysis of Transcriptions

The transcription process was completed in November of 2003 with 1876 pages of transcriptions available for analysis. The open-ended nature of respondents' answers yielded rich and sometime complicated answers. These transcripts were converted into appropriate file formats and entered into files for use of ATLAS. The transcript files were individually read and iteratively coded.

Development of Codes

The coding procedure for the transcripts was iterative to allow for a process of digesting of the data and developing themes and insights. Themes emerged from the systematic coding of the transcripts. For example, examining the responses to the question "What do you think are the keys to successful wetland banking?" eventually led to a "theme code" labeled 'Keys to Success'. To reach this ultimate axle code, the iterative process roughly followed the multiple steps articulated by Corbin and Strauss (1998). First, the transcripts were "open coded" so that virtually every word of a transcript was coded (tagged with a label). Next, the transcripts were "axle coded" with the axle codes designed to form categories and then into categorical codes or themes (i.e., groups of axial codes) found within the data. The final iteration of the coding process was the selective or categorical coding process that further grouped and categorized the

data in order to derive theories or make conclusive observations about the data. These categorical codes roughly are equivalent with the themes analyzed in this study.

The process used a subset of transcripts for open coding to develop a set of axle codes. The remainder of the transcripts was then initially coded using the axle codes with new axle codes added as needed. As a result, the aggregate number of axle codes increased throughout the analysis process as new themes were discovered. Also, as the coding process proceeded, it became clear that some initial axle codes and themes would not be used in further analysis. Therefore, not all the axle codes are discussed in the results. The complete list of codes and final list used in analysis can be found in Appendix E.

Weighting of Variables

The collected data was also statistically analyzed. Since the sample was stratified based on state and the proportions of bank location across states was not uniform, it was decided to weight the variables in statistical analyses where appropriate. In other words, the data were weighted based on state wetland bank frequency to more accurately account for the variability of wetland banks in states. The procedure used to assign weights was as follows:

$$W_{(state)} = T_s/T * N/ N_s$$

Where: T = 380 (total number of banks)

N = 140 (total interviews completed)

T_s = number of banks within each state

N_s = number of banks actually interviewed within each state

Analytical Procedures-Miscellaneous Information

Two bank managers interviewed were not used in the analysis portion of this research. These two participants were managers of governmental programs and were not involved in actual wetland mitigation banks. The researcher used a code of "99" to indicate that the respondent did not know the answer to the question being asked. The code "88" was used to indicate that the response from the banker was unclear or that the banker was not asked this question. A code of 88 necessitated that the data for that item to be treated as missing. This occurred mostly with the questions that were added or revised during the data collection process or where bankers were simply not clear in their answer even with repeated probes. Due to time constraints, the difficulty in reaching managers and the limited number of questions this affected, the undetermined value was applied to this data set and it was decided not to return to these bankers to ask additional questions. The following chapter discusses the research results and, in particular, the codes developed and analyzed.

CHAPTER FOUR

RESULTS AND ANALYSIS

Introduction

This chapter presents results of the study and analysis of the individual interviews with wetland bank managers and sponsors. Both qualitative analysis as well as some quantitative analysis of the data are presented. This chapter is organized around thematic categories, the products of the iterative coding process of the interviews that involved successive open coding, axial coding and selective coding of the transcripts.

Study Response Rate

The initial list of 380 wetland banks and their managers was used to draw a stratified random sample of 145 potential participants. Each potential participant on the list was contacted multiple times. If deemed to be "unobtainable," the potential participant was eliminated from the sample and replaced with the next randomly selected participant from that state's wetland banks. For a wetland bank and its manager to be classified as "unobtainable," the interviewer must have attempted to contact them at least five times. A total of 50 wetland banks/managers were replaced as "unobtainable," one potential participant refused and two members of the sample turned out not to be wetland banks or bank managers. This resulted in a cooperation rate for this study of 99.3%, a contact rate of 74.1% and a response rate of 73.6% (American Association of Public Opinion Research, 2004).

Interviews-General Observations

In general, participants seemed very open to the project's questions and the research methods used. Almost a quarter of participants (23%) specifically asked for copies of a final report or finished product and were told that they would receive a brief report when the project was completed. This is in line with Write's (1996) observation that participants were more willing to cooperate with the research if the products of the research were made available to them.

It became evident from the outset of the project that wetland mitigation bank managers were interested in talking about their experiences. Initially, it was thought that each interview would take about ½ hour. However, managers had a lot to say about their banks and experiences. Even using re-directive prompts and other moderator interventions, bank managers took longer than ½ hour to answer the questions contained in the interview script.

One area of discussion proved to be problematic. This concerned wetland mitigation credit prices and pricing. It seems that wetland credit price information is a sensitive issue for many private entrepreneurial banks. This is not surprising and is in line with Wright's (1996, 59) experience that "in highly competitive markets, companies are often reluctant to disclose information which is regarded as sensitive and pertaining directly to their organizations."

Coding Process and Thematic Codes

As previously mentioned, the interview transcripts were iteratively coded. The coding process resulted in 44 thematic areas (categorical codes) (See Appendix E). The

reported analysis discussed here focuses on those thematic codes most relevant to this study. For each thematic code area presented here, an attempt is made to:

1) Describe the thematic area and the process for defining variables for quantitative analysis;
2) Describe the qualitative data and provide some representative quotes;
3) Present some quantitative analysis;
4) Include, where appropriate, a comparison of results from other studies; and
5) Make some general observations about the theme's data.

All statistical analyses presented here are based on data analyses adjusted (weighted) to reflect the actual distribution of banks in each state. The method used to determine the weight used is described in Chapter Three. Statistical analyses were undertaken using SPSS © software. In addition to frequency analysis, cross tabulation with chi-square analyses were undertaken to examine the significance of apparent relationships (differences) between thematic response categories and bank ownership type (public, private, and non-profit).

The chi-square test of association analysis is used to test the general hypothesis that there is no relationship between ownership type and various codes within the thematic categories. The alpha value used to test for significant differences in this study is 0.05. Such a 5-percent level of significant difference is standard in social science research.

Since not every banker interviewed addressed every topic (e.g. questions not asked, answer unclear, or didn't know), Table 1 presents the percentage of interviewees that did

not respond to particular research themes. For subsequent statistical analyses these responses were considered missing data.

Table 1: Wetland Bankers Not Providing Data on Themes

Theme	Percent
Years in Banking	7.5
Background and Training	9.1
Ecological Type	8.9
Proposed Banks	30.3
Purpose Banks	0.7
Current Status	1.1
Process of Creation	21.5
History land use	2.9
Who Calculates Credits	3.4
Credits calculation method	10.8
Credits release	18.6
Future Funding	25.2
Future Land	21.3
Permit Time	14.6
Monitoring Schedule	23.6
Monitoring Schedule Method	29.1
Service Area	11.9
Service Area Determination	21.8
Success Criteria Determination	13.7
Agency Support	26.6
Source of Clients	24.0
Type of Clients	22.0
Reasons Using Banks	14.2
Comparing	25.8
Keys to Success	1.0
Obstacles	1.0
Change one thing	4.2

Results: Wetland Mitigation Bank Manager Characteristics

Bank Ownership Type and Gender

Typically, three types of ownership are associated with wetland mitigation banks—public, private and non-profit. Public banks are owned by government agencies, private banks are considered entrepreneurial (i.e. for profit banks) and non-profit banks are run by non-profit agencies. The first major grouping of the data sorted the interview data based on bank ownership type. ELI (2002) added the additional ownership distinction of public-private partnerships. However, the reported research results focused on the

experiences of the three major bank ownership types and did not make the public-private distinction. The few wetland banks that might have been classified as public-private partnerships were placed in the category of private banks. The data (confirmed during interview) also allowed for classification of the gender of wetland banker sponsors.

Quantitative Results

Table 2 shows that about 70% of the banks in the study were of the private, entrepreneurial-type; about 22% were government wetland banks; and 9% were non-profit mitigation banks. The results also show that most managers (about 90%) are male.

Table 2 Ownership of Banks and the Gender of Respondents

Bank Ownership	**Percent**
Government	21.7
Private	69.3
Non-Profit	9.0
Gender	**Percent**
Male	90.3
Female	9.7

External Validity & Comparisons

The study result that most wetland banks are private, entrepreneurial types seems to differ from studies of wetland banks in the early 1990s. It has been reported that in the early 1990s, most wetland banks were government owned and operated (Marsh, 1996). However, the changing nature of wetland bank ownership towards entrepreneurial types, as found in this study, is in line with other recent studies. ELI (2001) reported an increasing number of private commercial banks for the period between the early 1990's to 2001.

This project's results are also in line with changes seen in Florida. In 1992, there was only one private commercial wetland mitigation bank in Florida (ELI, 2001). However,

the recent Army Corps of Engineers Florida study showed that in 2001, 62% of the wetland banks were private commercial banks (Scodari, ACOE, 2001).

Background of Bank Managers

Bankers were asked to speak about their own background and training. Subsequently, this information was placed into the ATLAS © theme, "history of manager in wetland banking." Value codes pertaining to "highest level of schooling reported" were used for quantitative analysis. The values used included: no formal schooling, associates degree, Bachelors degree, Masters degree, PhD and other (e.g., JD, DO). The type of degrees received or field of study for bank managers was also noted and coded into ATLAS© as "profession of bank manager."

Quantitative Results

Table 3 shows data on the background education of bank managers with the highest percentage of managers (50.3%) attaining their bachelors degree and about a quarter of bank managers (24.2%) receiving a masters degree.

Professional background, as reported by managers, did not vary considerably. Most managers' bachelor and masters degrees were in Biology, Ecology, Environmental Science, Natural Resource Management and Engineering (Civil or Environmental). Interestingly, a few managers reported having degrees in Political Science, Accounting, Journalism, Photography, Cultural Anthropology, Marketing and Business Management. Some bank managers also reported expected PhDs in various areas including, Marine

Biology, Conservation Biology and Natural Resource Management. Five respondents held degrees such as JD or DO.

Table 3 Background and Training of Bank Managers

Background and Training	**Percent**
No Formal Schooling	11.4
Associated	3.1
BS	50.3
MS	24.2
PhD	6.4
Other	4.6

How long has the banker been involved in the industry?

The number of years a banker reported to have been involved in the wetland banking industry was coded as "history of manager in wetland banking." This data provided insight into whether the industry appears to be recruiting new professionals or retaining those that have been involved since the beginning of the wetland banking industry.

Quantitative Results

As Tables 4 and 5 illustrate, most wetland bankers have been involved in the industry for some time. The vast majority of bankers (81.1%) have 5 or more years on the job with the mean time reported as 9.08 years. The range of on-the-job wetland banking experience for bankers is one year to 25 years.

Table 4 Number of Years Bank Manager Working in Wetland Banking Industry

Number of Years	Percent
One Year	0.8
Two Years	1.4
Three Years	10.2
Four Years	6.5
Five Years	6.7
Six Years	12.4
Seven Years	4.5
Eight Years	8.8
Nine Years	6.0
Ten Years	12.4
Eleven Years	4.5
Twelve Years	3.0
Thirteen Years	3.2
Fourteen Years	4.9
Fifteen Years	4.9
Fifteen Years Plus	9.6

Table 5 Descriptive Statistics on the Number of Years Bank Managers in Wetland Banking Industry

N	Minimum	Maximum	Mean	Std. Deviation
129	1	25	9.08	4.974

Summary-Mitigation Bankers

The data show that the majority of national wetland mitigation banks are the private, entrepreneurial type with bankers predominately being male. It appears that individuals working in wetland banking tend to have studied biological sciences, with a few focusing on business studies. Most bankers report having been in the industry for 5 or more years. The industry seems to be retaining wetland bankers, and not hiring many new ones.

Results: Wetland Mitigation Bank Characteristics

Type of Wetlands in Banks

Wetland bank managers were asked to describe their wetland bank—the ecological type of wetlands in their bank, its location and its size. Information provided regarding ecological type was coded as "type of wetland." Respondents reported their banks to be of varying ecological types including bottomland hardwood, pine savannah and vernal

pools. Some of the respondents knew their bank contained several different types of wetlands and in some cases referred to their banks as a mosaic of wetlands. These responses were subsequently coded as "varied." In some cases, managers did not know detailed ecological information and instead used such descriptors as emergent, freshwater, created and preserved to describe their wetlands.

Qualitative Results

In total there were nine (9) codes used to capture the range of responses concerning the ecological types of wetlands (see Table 6). The most frequent response was "varied." Managers gave responses such as,

> "Well, we have 7 major wetland community types ranging from sub-emergent-emergent marshes all the way up to hydro-pine flat wood and riparian forest" (0554).

The second most frequent response was "bottomland hardwoods" and responses included statements like:

> "Well, we focus when we can on bottomland hardwood restoration or bottomland hardwood creation because that mainly what [has been] lost" (026).

A more complete representation of the range of responses can be found in Appendix F, Section 1.

Quantitative Results

As Table 6 illustrates, about 31% of wetland banks were reported by wetland bank managers to be of varied type and 28.0% were reported to be bottomland hardwood.

Table 6 Ecological Type of Wetland Banks

Ecological Type	Percent *
Varied	31.2
Bottomland hardwood	28.0
Restored/enhanced	4.7
Preservation	0.8
Flatwood Savannah	1.6
Creation	0.6
Emergent/Freshwater	7.4
Vernal Pools	4.4
Other	21.3

* Does not total 100% due to multiple responses

External Validity & Comparisons

Previously, ELI (2001) looked at information on compensatory mitigation credit type, not the ecological type of wetland banks. This study's reported findings provide new insight into the composition of wetland mitigation banks' ecosystems.

Summary

The data revealed that the types of wetlands in mitigation banks seem to vary dramatically across eco-regions in the United States. The high percentage of managers reporting their ecological type as varied is logical, when one considers that banks with varied ecological types enable bankers to meet the demand for replacement of a variety of different ecological types of wetlands. The large percentage of wetland banks reporting bottomland hardwood is also logical when considering this wetland type is prevalent in the southern United States, the location of many banks and wetland losses.

Location of Wetland Banks

Data collected from participants regarding locations of wetland banks were coded as "location of wetland." This location information was often detailed. The U.S. Army Corps of Engineer District managing each wetland bank was determined by the

researcher before the interviews using the master list of bankers compiled in 2000. Managers confirmed their bank's location during the interview.

Quantitative Results

According to the initial list of wetland banks and bank managers in this study, the study participants were working in 34 US Army Corps of Engineers Districts. As Table 7 illustrates, the New Orleans ACOE district had the highest percentage of wetland banks in this study with 20.5%, the Norfolk Virginia district had the second highest with 9.4% and the Jacksonville Florida Corps district was third with 9.2%. The results of this study revealed that bank managers are working in 36 states (See Table 8). Louisiana, Florida, Virginia, and California were the states with the highest number of wetland mitigation banks in this study with 20.5, 9.2, 8.7 and 8.4 percent respectively.

External Validity & Comparisons

The ELI study, done in 2001, reported wetland banks in 40 states. This study's different results may be due to differences in data collection methods. ELI (2001) collected data using agency mitigation documentation, while this study used information from personal communications with agency personnel. Apart from the differences in the number of states with wetland mitigation banks, this study found equivalent distribution of banks in Florida and California and more wetland banks in Louisiana as compared to the ELI study.

Table 7 Army Corps of Engineers District of Wetland Mitigation Banks

ACOE District	Percent
New Orleans	20.5
San Francisco	5.6
Jacksonville	9.2
Rock Island	4.0
Vicksburg	1.6
Mobile	3.9
Savannah	4.3
Charleston	2.9
Sacramento	1.9
Detroit	0.3
Nashville	1.1
St. Paul	2.4
Galveston	1.6
Norfolk	9.4
St. Louis	1.6
Buffalo	1.6
Louisville	1.3
Chicago	4.4
Omaha	3.6
Portland	1.8
State of NJ	2.6
Ft. Wroth	1.1
Nashville	0.7
Little Rock	0.7
Huntington	2.6
Kansas City	0.5
Los Angeles	1.4
Wilmington	3.4
Memphis	1.1
State of MI	0.3
Baltimore	1.6
Seattle	0.5
Albuquerque	0.3
Walla Walla	0.3

Table 8 State Location of Wetland Mitigation Banks

State	Percent
AL	0.8
AR	0.8
CA	8.4
CO	1.6
FL	9.2
GA	5.0
IA	1.8
ID	0.3
IL	6.6
IN	0.8
KY	0.8
LA	20.5
MD	0.8
MI	0.3
MN	0.8
MO	2.1
MS	4.7
NC	3.4
ND	0.5
NE	1.3
NJ	2.6
NY	0.8
OH	3.4
OR	1.8
PA	0.8
SC	2.9
SD	0.3
TN	2.6
TX	2.6
UT	0.5
VA	8.7
WA	0.5
WI	1.6
WY	0.3

Summary

The precise location of individual wetland banks proved difficult to summarize. Some wetland bank managers could give information on the location of their bank, while others could not. Some wetland bank managers owned and operated more than one bank. For the purposes of this study, it was decided that a general location of bank, including ACOE district and state, was adequate for a profile of the nation's wetland mitigation banks. This study did not use mitigation paperwork in agency offices, which might allow for mapping of wetland banks using GIS technology. The largest number of wetland mitigation banks are in the New Orleans, Louisiana, Jacksonville, and Florida Corps districts. This seems logical since these areas are densely populated and contain a large percentage of wetland acreage.

Size of Wetland Bank

Data regarding size of wetland banks were coded into ATLAS as "size of wetland." The research revealed some managers owned more than one bank and that some managers were able to systematically describe their banks in size order. Size data were used to compute both an average and range of the nation's bank sizes. A total of 126 managers provided specific, discrete bank sizes. In 51 instances, wetland bank managers initially reported a range of bank sizes. In eight (8) cases, the respondents did not get more specific than a size range. To compute the average size of mitigation banks, it was decided to incorporate these 8 cases by using an average of the range reported.

Quantitative Results

As can be seen in Table 9, the mean bank size based on averages reported by respondents was found to be about 963 acres. Where bank managers only reported a range of their bank size, the mean range of wetland bank size was found to be approximately between 232 acres and 1145 acres.

Table 9 Size of Wetland Mitigation Banks (acres)

	N	Minimum	Maximum	Mean	Std. Deviation
Range Low	51	0.50	2600.00	231.9905	501.75020
Range High	51	3.20	18000.00	1145.4992	2687.40206
Average	134	4.25	48000.00	962.7758	4337.71895

External Validity & Comparisons

ELI's national study (2001) did not specifically examine the size of current wetland mitigation banks. However, The ACOE found in their Florida study that "most active banks range in size from several hundred to several thousand acres" (Scodari, ACOE, 2001, 8).

Summary

The data obtained in this study revealed a wide range of wetland bank sizes, with the mean bank size somewhere near 900 acres. There seems to be no minimum or limit on wetland bank size set forth by the ACOE or EPA, and therefore a wide range of sizes was not unexpected. The Florida study supports the research result of great variability in mitigation bank sizes.

Proposed Wetland Banks

Data obtained from wetland bank managers regarding the number of proposed banks or bank expansions under consideration were coded as "proposed banks" in ATLAS. For quantitative analysis, if a manager had no immediate or future plans to build another wetland bank, a zero was recorded while if the banker planned one bank or expansion, a number one was recorded. The quantitative data set subsequently was augmented to reflect the total number of planned banks or expansions mentioned by respondents.

Qualitative Results

There were five (5) qualitative code categories used to capture the various numbers of proposed wetland mitigation banks revealed by participants. The most frequent code for wetland bank expansions was "zero," with respondents stating such things as,

> "We have identified some properties but what's happened is the isolated wetlands ruling, which came down two years ago, absolutely drove a dagger into our back...we have not sold any acres in 2 years" (22281).

The largest number of proposed banks was "Seven" with that one respondent stating the following:

> "Yes, there are about 7 of them that are currently being you know in various stages, feasibility study we've got about three that we're already putting up money to purchase the land" (33376).

A complete representation of the range of responses can be found in Appendix F, Section 2.

Quantitative Results

In the case of proposed banks, an analysis (see Table 10) revealed what appears as more government banks with plans of one, two, and seven additional banks or bank expansions as compared to private and non-profits. To explore this, further analysis of government, private and non-profit banks regarding the number of proposed of banks (zero vs. one or more) was undertaken using pair-wise cross tabulation (chi-squared analysis). It was learned private banks are significantly more likely to not have any proposed banks when compared to government ($p<0.025$). No other significant differences were found among the data.

Table 10 Number of Proposed Wetland Mitigation Banks (percentage)

Number of Proposed Banks	Government	Private	Non-Profit
Zero	40.9	67.6	66.7
One	31.8	14.7	0
Two	23.8	16.4	22.2
Three	0	1.5	12.5
Seven	4.5	0	0

External Validity & Comparisons

The Corps of Engineers concluded in their 2001 Florida study that the wetland banking industry appeared to be slowing: "Regulators indicate that at the present time the bank development pipeline does not include a significant number of viable bank proposals" (Scodari, ACOE, 2001, 8). The results reported here, that a high number of managers reporting zero new banks or expansions, appear to in line with the Florida study.

Summary

The reported results do not evidence widespread growth of current wetland mitigation banks. The research revealed there are few new wetland acres being contemplated as part of banks' expansion plans. Subsequent research may shed some light on the obstacles to wetland banks and their expansion.

Purpose of Bank

Data from the interviews regarding the original purpose for banks and/or the changed purpose for banks was placed in an ATLAS theme of "purpose of wetland." Purpose codes included: environmental purpose (to provide habitat value, water quality, or wetland preservation); market demands (to meet an economic demand for credits in the area); a profit motive (to make money); or to meet a specific project's mitigation needs (government banks for transportation projects).

Qualitative Results

Five (5) codes captured the range of thematic responses concerning the purpose of wetlands. The most mentioned purpose from government managers was "to meet the mitigation needs of a specific project." The most mentioned purpose from private managers was "profit." Private wetland bankers describe the purpose of their banks by saying that, "Those [wetland banks] were definitely established as mitigation banks to create mitigation credits as a private sector kind of venture" (26307). Non-profit wetland bank managers reported the majority purpose of their banks was environmental, saying

such things as, "There is the critical conservation need" (12160). A complete representation of the range of responses can be found in Appendix F, Section 3.

Quantitative Results

An initial analysis revealed what looked like more government managers mentioning specific project than did private and non-profits and that more non-profits seemed to mention environment and demand as reasons as compared to private and government banks. The frequencies also revealed what looked like more private banks mentioning profit and extra to sell than government and non-profits.

To explore whether such observations were statistically significant further analysis of private, government and non-profit regarding purpose was undertaken. Pair-wise cross tabulation analysis of private, government and non profit, as they related to particular purposes was undertaken. With regard to profit as a purpose, it was learned that government banks are significantly different from both private ($p< 0.000$) and non-profits ($p<0.000$). With regard to environmental purposes, it was learned that government banks are significantly different from non-profits ($p<0.002$) but not private banks ($p<0.165$). Also it was revealed that private banks with environmental purposes are significantly different than non-profits ($p<0.015$). With banks developed for specific projects, it was found that government banks significantly differed from non-profits ($p<0.000$) and private ($p<0.000$). Government banks that cited demand as their purpose were significantly different from non-profits with such a purpose ($p<0.004$).

Table 11 Purpose of the Wetland Mitigation Bank (percentage *)

Purpose of Banks	Government	Private	Non-Profit
Profit	0	46.4	38.5
Environmental	24.1	38.1	75.0
Specific Project	75.9	15.5	0
Demand	17.2	34.0	61.5
Specific Project with Extra to Sell	0	5.2	0

* Does not total 100% due to multiple responses

External Validity & Comparisons

ELI's national study (2001) did not specifically examine the purpose of individual wetland mitigation banks. Instead ELI briefly described their bank classification systems. When examining private commercial banks ELI found a wide range of private sponsors that "does not lend itself to easy categorization" (ELI, 2001, 39). Private commercial banks were found to "span the gamut from small banks sponsored by private landowners seeking to make a profit to private companies created solely for the purpose for creating wetland mitigation banks" (ELI, 2001 39).

Summary

The data obtained in this study revealed a wide range of wetland bank purposes. Knowing the nature of the wetland banking industry this result was not unexpected and appears to be inline with other mitigation banking studies.

Current Status of Banks

Data from the interviews regarding the current status of banks was coded in ATLAS as "current status of bank." In instances where managers reported that they were working on plans for a wetland bank, such responses were coded "concept phase." Where banks

were currently under construction or had just completed the construction phase, those responses were coded "construction." Some banks were described by their managers as being in the monitoring phase (post-construction establishment phase) and were thus labeled as "monitoring." Finally, wetland banks finished with monitoring and in the maintenance phase were labeled as "complete."

Qualitative Results

The four (4) codes mentioned above were used to capture and analyze the range of thematic responses concerning the current status of wetland mitigation bank(s). Most respondents classified their wetland banks as being in the monitoring phase. A common response was, "Normally it [is] like 3 people that maintain the site year around, it is still under monitoring requirements" (0547). A complete representation of the range of responses can be found in Appendix F, Section 4.

Quantitative Results

In the case of current status of wetland banks, an initial analysis of the frequencies revealed what looked like more government banks mentioning banks being under construction than did private and non-profit. Further analysis of the government, private and non-profit data regarding current status of bank was undertaken. Pair-wise cross tabulation revealed that government banks under construction significantly differ from private banks ($p<0.004$) regarding construction but not non-profits ($p<0.339$).

Table 12 Current Status of Wetland Mitigation Bank (percentage *)

Current Status of Banks	Government	Private	Non-Profit
Monitoring	89.7	86.6	100.0
Construction	20.7	4.1	8.3
Concept	10.3	11.3	15.4
Sold Out/Complete	0	10.3	0

* Does not total 100% due to multiple responses

Summary

It proved difficult to obtain precise information from respondents in this thematic area. Managers typically had one or more wetlands banks, each in various stages of development. A significant number of government wetland banks reported being in the construction phase. This is in line with previous research suggesting government banks as one sector that proposes the most new banks (ELI, 2002).

Wetland Creation Process

The process used to create the wetland ecosystem of a mitigation bank varies dramatically based on the bank's eco-region and the type of wetland to be constructed (i.e., created, enhanced, restored, or preserved). Assigning codes to each respondent's responses concerning wetland creation processes was difficult. Some bank managers were either not sure or not very specific about the wetlands creation process employed in the wetland bank. These managers typically had hired consulting or engineering firms to do the majority of the work and thus were somewhat removed from personal knowledge of the wetland creation processes. As a result of the ambiguity of many of the responses in this thematic area, the data were summarized to record whether the particular wetlands in banks were created, enhanced, restored, or preserved. If a manger reported there was more than one type of creation process used, the data were coded into multiple categories.

Qualitative Results

There were five (5) groups of responses in this thematic area (see Table 13). The restored category was most frequently used to capture the information gathered by the researcher. Typically, managers would share information about how their wetlands were restored. For example, "We filled in some ditches that had been dug on the property to drain it; we put in ditch blocks that would in effect restore the retention of water on the property" (0552). A complete representation of the range of responses can be found in Appendix F, Section 5.

Quantitative Results

Restoration (73%) proved to be the most frequent wetland creation method in the nation's wetland mitigation banks.

Table13 Process used to create Wetland Mitigation Banks

Process of Creation	**Percent ***
Restored	73.0
Enhanced	4.0
Created	8.6
Preservation	1.9
More than one mentioned	12.6

* Does not total 100% due to multiple responses

Summary

The result of this theme, that the majority of banks use restoration as the primary creation process, is logical since former wetlands typically have the necessary elements to be relatively easily reconstituted once wetland hydrology is restored. This finding is in line with previous research results that most wetland banks are being formed on land previously in agriculture use (ELI, 2001).

Original land use of the bank site

Data obtained from respondents regarding the history of the land in their wetland bank were coded within ATLAS as "history of land use." Previous land use codes included farmed/agriculture, timber/forest, grazed land, idle land and sand/gravel/clay pit.

Qualitative Results

Six (6) codes (see Table 14) were used to capture the range of thematic responses concerning the original land use of bank land. The most predominate response (agriculture) revealed that most wetland bank land was formerly in use as agriculture with respondents giving answers such as, "No question, it was farmed from about 1850 up until 1980. Then it was mined for gravel in the 50s and 60s" (09110) and "[t]ypically most land use has been pasture, hayfield, sometimes vineyard or other agriculture" (037). A complete representation of the range of responses can be found in Appendix F, Section 6.

Table 14 History of the Land occupying Wetland Mitigation Banks

History of Land	Percent *
Land was farmed or in agriculture	75.8
Timber or forestry	15.3
Land was used for grazing	7.3
Land was idle	12.5
Sand/gravel/clay pit	2.0
Other	2.8

* Does not total 100% due to multiple responses

Quantitative Results

The quantitative analysis reported in Table 14 show "farmed /in agriculture" being mentioned most frequently (75.8%). The second most frequent previous land use was

"timber or forestry" (15.3%) and the third most frequently reported previous land use was "land was idle" (12.5%).

External Validity & Comparisons

These findings about previous land uses are quite similar to those found by the 2001 ELI study. ELI reported that over 65% of wetland banks are sited on land with a history of use in agriculture. Moreover, they support the findings about that 76 percent of bank managers report using restoration as the primary means for "creating" wetlands for their bank.

Summary

This quantitative result was expected as many managers spoke about restoration of wetlands on former farm land during the interviews. This result also is logical considering the history of wetlands in this country, and their subsequent drainage for farm land.

Wetland Credits - Who calculates the credits given to each bank?

Bank managers were questioned on a range of wetland credit topics including who calculates the number of credits for their bank. Data regarding wetland credit amount determination as well as the entity conducting the credit calculation were coded in the ATLAS theme "credit amount." If a manager's response regarding who determined the amount of credit was that a federal or state agency determined it unilaterally, that

response was further coded as "agency." If it was clear that a negotiated process between the bank and the agencies was used that information was coded as "negotiated."

Qualitative Results

There were three (3) codes (see Table 15) used to capture the range of thematic responses concerning what entity calculates the number of credits with the most predominate response being "agency." A typical response coded as agency was,

> "The Corps did the whole thing, the Mitigation Review Team. We did nothing but what they tell us to do. There is no negotiating over anything with them, nothing, none, zero" (12178).

A representation of the range of responses can be found in Appendix F, Section 7.

Quantitative Results

As Table 15 shows, 88.9% of government banks, 82.3% of private banks and 100% of non-profit banks have agencies as the main determining factor for the number of credits given to their bank. A pair wise cross tabulation analysis of wetland ownership type (government, private and non-profit) and credit calculation did not reveal any statistically significant differences in the agency/negotiation mix for wetland banks.

Table 15 Entity conducting Credit Calculation for the Wetland Mitigation Banks (percentage)

Entity Conducting Credit Calculation	Government	Private	Non-Profit
Agency	88.9	82.3	100
Negotiation	11.1	17.7	0

Wetland Credits - How are wetland credits calculated by this entity?

Data regarding the determination process for the amount of credits given to banks for their wetland acreage were complicated and elaborate. This information was recorded in ATLAS under the code "credit amount". The methods used by the various banks and Corps districts ranged from complex mathematical formulas to simple acre conversions. Most respondents discussed calculation methods in enough detail so that best professional judgment could be used to categorize their responses as functional, acreage, or acre/type calculations. "Acre/type" calculations used some form of acreage conversion with an additional component of adjusting for type or quality. For example, a banker who restored one acre of wetland might receive one credit (acreage one for one) and perhaps receive and additional credit for enhancement (1/2 acre) or preservation (1/3 acre). Bankers not describing some acre/type computation process typically reported their wetland credits being calculated based on acreage (e.g., one acre restoration equals one credit); coded as "acre." The "function" code category was used to capture instances where credits were based on a functional or quality assessment. These functional assessments varied between sophisticated assessments (e.g., WRAP, Charleston method) to simple, best professional judgment quality assessment in the field. In two cases, banks did not seem to fit any one of three categories and were coded as "other."

Qualitative Results

Four (4) codes (see Table 16) captured the range of thematic responses concerning how wetland credits are calculated with the most predominate credit calculation appearing to be acre/type. This type of credit calculation method was described by

responses such as, "They're giving us one to one credit for each acre of restored wetland, half of one for each acre of enhanced wetland and a third of a one for each acre preserved" (23282). A complete representation of the range of responses for this theme can be found in Appendix F, Section 8.

Quantitative Results

An initial analysis of the data revealed acre/type as the predominate method used. Pair wise cross tabulation analysis of the ownership types with the credit calculation methods revealed that use of acre/type credit calculation method by private banks is significantly different from that of non-profit banks ($p< 0.046$) but not government banks ($p<0.496$). No other statistically significant relationships were found.

Table 16 Credit Calculation Method used by Entities (percentage)

Methods used for Credit Calculation	All Banks	Government	Private	Non-Profit
Acre	25.2	28.0	25.0	18.2
Functions	24.6	20.0	28.4	8.3
Acre/Type	49.3	52.0	44.3	75.0
Other	0.9	0	1.1	0

External Validity & Comparisons

The 2001 ELI study found that functional assessment methods were used to define credits for approximately 13% of all wetland mitigation banks and that 23% of banks used some type of "combined approach, which relies upon best professional judgment to scale wetland acreage according to some value of functionality" (ELI, 2001, 59). ELI's "combined approach" is comparable to this study's credit calculation code of "acre/type." The ELI study found that 61% of banks used a credit definition of "acreage" and three banks used only best professional judgment for their credit determination (ELI, 2001).

Summary

While the reported research found no banks that only used best professional judgment for determining credit amount, the other results are in line with previous research. This study found the number of banks using functional assessments (24.6%) to be slightly higher than that of the 2001 ELI study (13%). It also found larger numbers of banks using a combined acre/type approach (49.3%) than ELI (23%). It seems possible that there has been an increase in using functional assessment methods and combined approaches to determine bank credit amounts. More research in this area is necessary.

Credit Price

Data regarding credit price were coded in ATLAS as "credit price." Actual credit price was difficult to summarize with some bankers reporting prices per acre while others reported prices per credit. Data reported here only contains credit price when reported per acre or the conversion from credit price to price per acre was clear. This type of conversion was most frequently seen in California where credits tend to be sold at 1/10 of an acre. Managers reported credit price per credit and the data was converted to a per acre price for comparison. Further complicating data collection in this theme, some bankers would only respond with a credit range. Respondents only reporting one price were recorded in SPSS as "cost of credits." Respondents reporting a range had their lower amount entered as "cost of credits" and their upper amount entered as "cost of credit high."

Quantitative Results

As can be seen in Table 17, the mean low credit price was approximately $43,519 per acre with a standard deviation of 78,439, and the mean high credit price was approximately $93,873 with a standard deviation of 157,202.

Table 17 High/Low Wetland Mitigation Banking Credit Price

	N	Minimum	Maximum	Mean	Std. Deviation
Credit Low	99	1,000	400,000	43518.85	78439.36
Credit High	49	2,000	900,000	93873.08	157202.44

Summary

Capturing credit price data proved to be challenging, as many managers owned more than one bank, with each having different prices. Also, most government banks did not have a set credit price. Further complicating matters, credit prices vary dramatically according to regional land prices. Also, due to the market nature of the industry, many bankers were reluctant to report their wetland credit prices. Even having a national range of credit prices does not necessarily accurately depict many factors (e.g., regional differences, development pressures) contributing to wetland mitigation credit cost and market prices. A more accurate picture of credit prices might include such factors as geographic characteristics, region, proximity to metropolitan areas, and degree of market saturation.

Credits Release Schedule

Data regarding credit release schedules were coded using the ATLAS theme "credit release schedule." Responses were recoded for use in SPSS based on the percentage of the total number of credits received that had been released (for sale) to bank managers at the signing of their banking agreement. If a manager received no credit at the signing of

their banking authorization, a value of zero was assigned. Successive values were assigned to categories with the following ranges of percentages: "5-29," "30-50," "51-99," and "100."

Qualitative Results

There were a variety of responses to questions posed to bankers under this thematic area. Most bankers had some idea about the percentage of credits released to them. A complete representation of the range of responses can be found in Appendix F, Section 9.

Quantitative Results

In the case of credit release, an initial analysis of the frequencies seemed to show that more non-profits mentioned receiving 30-50 percent of their credits for sale at the signing of their banking agreements than did government and private banks. It also appeared that more non-profits and private banks received 100% of their credits at the signing of their banking agreement than government banks, and that more government and non-profits received zero credits at the signing of their banking agreement than private banks. To explore this, cross tabulation analysis of government, private and non-profit organizations' credit release data was undertaken and revealed that government banks were significantly different from private ($p<0.036$) and non-profit ($p<0.044$) regarding the release of 100% of credits at time of singing. Government banks significantly differed from private ($p<0.000$) but not non-profit ($p<0.258$) banks in those cases where zero credits were released. No other significant differences were found among the data.

Table 18 Number of Credits released to a Manager upon Signing of the Banking Agreement (percentage)

Credit Release Schedule	Government	Private	Non-Profit
Varied	15.0	12.2	0
Zero	45.0	8.5	25.0
1-29 Percent	25.0	31.7	16.7
30-50 Percent	10.5	18.5	30.8
51-99 Percent	0	2.4	0
100 Percent	5.0	26.8	30.8

External Validity & Comparisons

In the 2002 ELI study, 92% of the nation's wetland banks allowed credits to be withdrawn from a mitigation bank before the bank was mature. However the ELI study reported that:

> "although a high percentage of banks allow release of credits prior to achieving all performance standards, most banks retain at least half of the potential credits for release after some performance standards have been met" (ELI, 2001, 63).

The ELI report did not delineate credit releases in the same way as this study, but they did find that,

> "on average, banks allow for the advance debiting of 66% of credits prior to meeting all performance standards and 42% of credits prior to achieving interim performance standards or a portion of their standards" (ELI, 2002, 64).

They also reported that, "the percentage of credits release before achieving all performance standards ranges from 15% to 100%" (ELI, 2002, 64). The reported research findings are in line with the range of credit releases reported by ELI (2002).

Summary

This research result shows ownership type is a factor in credit release schedules. Generally government banks have not received large amounts of credit releases at the

signing of their banking agreements. The general observation that private and non-profit banks receive considerably higher credit releases vis-à-vis government banks appears logical since private and non-profit bankers tend to be more interested in receiving funds at the beginning of a banking project than do government entities.

Future Funding

Data regarding future funding of wetland mitigation banks were coded under the ATLAS theme "future funding of bank." Bankers often thought that questions about funding referred to financial assurances for their banks in the proposal and monitoring stages. Those types of bonds or escrow accounts are typically returned to the banker at the end of the monitoring phase. Due to this established banking practice, it became clear that it was necessary to clarify this question to address only those funds that bankers set aside for future, long-term maintenance. If it was clear that the respondent understood this and responded yes to this question, then that response was coded as a "yes" value (money would be set aside for long-term maintenance). If the banker clearly said that there would be no future money for the bank, this was given the value of "no."

Qualitative Results

A complete representation of the range of responses given for this theme can be found in Appendix F, Section 10.

Quantitative Results

Table 19 shows that bankers were evenly split between those responding yes and no regarding future moneys for bank maintenance, regardless of bank ownership type. The pair wise cross tabulation confirmed that there was no statistically significant differences in future funding based on ownership type.

Table 19 Future Funding for Bank Maintenance (percentage)

Future funding for the bank	Government	Private	Non-Profit
Yes	54.5	53.3	44.4
No	45.5	46.7	55.6

External Validity & Comparisons

Because the 2002 ELI study relied on bank documents filed with the USACOE, it was able to go into some depth regarding this type of question. The ELI study examined sponsors' financial assurances in various stages of banks' development. These stages included bank establishment, bank oversight and long-term management. The reported research focused on long-term funding for the bank which makes it difficult to compare results with ELI results. However, ELI did find that "fewer than half of the banking instruments that contain information on long-term maintenance also contain specific information on financial assurances for long-term maintenance" (ELI, 2002, 68).

Summary

The reported research revealed two points regarding future funding of a bank, (1) the ownership of a bank does not seem related to long-term funding for a bank, and (2) only 50% of the nation's banks have future funding for management.

Future of wetland bank land

Data regarding the future of the lands under control in the wetland bank were placed in the ATLAS theme "future of wetland bank land." Four types of future plans for property in the wetland banks emerged from the interviews: 1) the land would be turned over to a governmental resource agency (state, county, city or federal) [coded as "agency"]; 2) the banker would retain ownership of the wetlands [coded as "still own"]; 3) the land would be turned over to a non-profit [coded as "non-profit"]; 4) or the land in the wetland bank was to be eventually sold [coded as "sell/sold"].

Qualitative Results

There did not appear to be one predominate future plan for the property in the nation's wetland banking land. Some representative comments were:

"Still own": "We actually still own all of our sites and we manage all of our sites, even after all the credits are sold" (0320).

"Turn over to agency": "We are turning them over to either the Fish and Wildlife Service or the Game and Fish Commission for management" (024).

"Sell": "It was just sold" (0689).

"Turn over non-profit": "We have title to the [land], but in the long term we will eventually turn that over to the Nature Conservancy" (26305).

A complete representation of the range of responses can be found in Appendix F, Section 11.

Quantitative Results

An initial analysis of the frequencies for the categories of this theme revealed what looked like more government and private banks planning to turn their banking land over to an agency than did non-profits. It also appeared that more private and non-profit banks had plans on turning their banking land over to a non-profit than did government banks. The pair wise chi-square analysis of government, private, non-profit bank ownership regarding the future of wetland banking lands revealed that government-owned banks significantly differed from private ($p<0.040$) but not non-profit ($p<0.131$) regarding their future plan for land currently in wetland mitigation banks being turned over to a non-profit organization.

Table 20 Future of the Wetland Mitigation Banking Land (percentage *)

Future wetland banking land	Government	Private	Non-Profit
Still Own Land	52.2	41.0	66.7
Turn Over to Agency	47.8	35.4	12.5
Turn Over to Non-Profit	4.5	24.4	22.2
Sell/Sold	0	2.5	0

* Does not total 100% due to multiple responses

External Validity & Comparisons

The conversational interviewing in this study proved to be effective for learning about and understanding bank managers' plans for the future of wetland banking land. For example, ELI's document-based analysis revealed that, "Of the 219 banking instruments analyzed, 44% indicate information on long term management requirements" (ELI, 2001, 84). ELI did comment "the vast majority of the banks established today are not held in perpetuity by the bank sponsor; rather they are transferred to a public agency or non-profit organization in the business of land preservation" (ELI, 2002, 84). Where there were relevant data regarding the future disposition of land in banks, ELI did attempt to

gather it. Of the 65% of banks that had indicated some long-term management plan (44% of all Banks), ELI found 56 banks identifying a public agency, 34 indicating the sponsor, 22 specifying a non-profit organization, 16 stating that either a non-profit organization or a public agency, and 18 not specifying the future owner of lands in the wetland bank.

Summary

The number of government banks planning to keep their wetland banking land was surprising considering that transportation agencies tend not to be land management agencies. However, the limited amount of banks being sold was as expected considering the limited development potential and uses for such property once restrictive easements are in place.

Permits for the bank

Bankers were asked about the amount of time it took them to complete the permit process, and also about the process and their interaction with agencies. The data were collected under the ATLAS theme "permit time" and subsequently analyzed to determine specific values. Data were categorized based on a range of time (similar to the scheme used for categorizing the credit release schedule).

Quantitative Results

Table 21 shows that the largest group of government banks (34.8%), private banks (23.3%) and non-profit banks (45.5%) need four years to be permitted while the largest number of banks were permitted in 1 to 4 years. Further analysis of government, private

and non-profit banks and their permit-issuance time was undertaken. It was learned that government bank permit times were significantly different from both private ($p<0.020$) and non-profit ($p<0.035$) when exploring the three year permit period. It seems that more government banks are permitted by the fourth year of the wetland bank permit process than private and not-for-profit wetland banks.

Table 21 Time Frame for a Manager to complete the Permit or Banking Agreement (percentage).

Permit Time	Government	Private	Non-Profit
One Year	8.7	14.0	18.2
Two Years	17.4	8.1	0
Three Years	0	19.8	18.2
Four Years	34.8	23.3	45.5
Five Years	4.3	3.5	0
Six Years	8.7	17.4	27.3
Eight Years	8.7	8.1	0
Nine Years	13.0	7.0	0

Summary

There was no previous information on permit process time for wetland mitigation banks. The research results suggest that most wetland banks received their permits within four years of initiated the process.

Agencies

Data regarding which agencies were involved in the creation of the wetland banks were captured under the ATLAS theme "agencies worked with." However this information was almost impossible to code into value groups because every region of the country seemed to work with a different set of agencies. Every Corps district appeared to run the permitting of their wetland mitigation banks slightly different. Various areas of the country with different eco-regions will also have different agencies that need or want to be involved in the process (e.g. NOAA and/or The National Marine Fisheries Service

for coastal regions). Instead of trying to summarize this information, it was decided to examine the data for difficult or problematic agencies. However, since this was not a direct question asked of all respondents, no statistical observation or summary is presented. However, the conversational interviews did result in some bankers being willing to express frustration regarding particular agencies.

Qualitative Results

Some managers mentioned problems or difficulties in dealing with the U.S. Fish and Wildlife Service. For example, as one banker put it,

> "The most difficult problem we had was with the Fish and Wildlife. I didn't find them bad people; I just found their goals and objections so much different than ours and so much more demanding and stringent that it was a tough job" (09109).

A complete representation of the range of responses can be found in Appendix F, Section 12

External Validity & Comparisons

The data gathered within this theme coincided with the data gathered in the study done in Florida by the Corps where it was reported that some bank managers expressed frustration with the US Fish and Wildlife Service. "Bankers single out the FWS as the one Federal agency that most often impedes bank development through the MBRT consensus requirement" (Scodari, ACOE, 2001, 23). This is not surprising since the

primary role of the FWS is to protect and provide habitat for animals and not the expeditious processing of business's application to operate.

Cost of creation

Questions about the cost of wetland creation were asked of many, but not all, of the bank managers. A question concerning the cost of creation of wetland banks was specifically added to the discussion guide because it appeared to be of interest to bank managers. Data under this theme were coded in ATLAS as "cost involved in creation." Some respondents seemed to know their creation cost per acre, some reported total project costs, with others reporting they did not know about the costs of their wetland bank creation. Further complicating analysis of this theme, the component parts of the costs of wetland bank creation varied between respondents with some reporting costs associated with land acquisition only, construction costs only, or both. For many bank managers, it was difficult to distinguish various costs.

Qualitative Results

Not surprisingly, many managers expressed concern about trying to determine and report their cost figures. For example, bank mangers typically reported,

> "That's a hard number to come up with because you have the cost of the land and you have the cost of the excavation, you know that's a number that I just, it depends on how you look at it. I got the benefit of hauling the dirt from the wetlands to help my development. But then it also cost me if I was going to go and built the wetland and just make it a wetland itself it

would have cost me quiet a bit to do that. I would have been better off developing that piece of ground and selling the lots off if, I could have made more money that way so it depends on how I want to value the land and how I want to put the numbers where, so there is not a real good answer to that one" (20268).

Quantitative Results

Managers clearly had difficulty in reporting a cost of creation figure. It was also clear the nature of compiling such a figure was complicated and involved many factors. Therefore figures obtained from managers were not considered reliable and therefore were not reported.

Summary

This theme proved there are many factors that go into determining total cost of wetland bank creation including land, construction, engineering and consulting cost. It seemed that many bankers could not give accurate estimates. A contributing factor may be due to the nature of the conversational interviews. Bankers did not tend to have this information "at the top of their head."

Monitoring Schedule

Data collected from respondents regarding their banks' monitoring schedules were captured under the ATLAS theme of "monitoring schedule." Data here showed some bank managers reporting more than one monitoring time because mangers often own more than one bank. For statistical analysis, monitoring time in this study is the longest

time reported by the manager. Managers who reported monitoring time as perpetual were asked to clarify their response to include only the time in which reports needed to be filed. This theme also allowed for the capture of information on how monitoring times were determined. The four principal methods for determining the required monitoring time of mitigation banks were categorized as: negotiation, agency, state, and success criteria.

Qualitative Results

Table 23 shows the eleven (11) codes used to capture the range of thematic responses concerning monitoring times and schedules. The most predominate monitoring time period reported by respondents was 5 years. Respondents made such statements as: "Yeah that is the standard. The agencies have decided that they want a minimum of five years of monitoring" (037). Regarding determination of monitoring time (Table 24), typical respondent statements (by category) were:

"Agencies" "That all came out of the MBRT process" (0566).

"State": "That's part of the Wetland Conservation Act, a state law that requires a 5 year monitoring period and the Corps went along with that" (15222).

"Negotiated": "That was something that was negotiated as part of our operating agreement" (0439).

"Met Criteria": "Until you've met all your thresholds" (09108).

A complete representation of the range of responses can be found in Appendix F, Section 13.

Quantitative Results

Table 23 shows the highest percentage of banks reported a monitoring time of 5 years. An initial analysis of the frequencies revealed what looked like more non-profit banks mentioning states and having met criteria as the determining factors than did private and government. Further analysis revealed that private banks significantly differed from non-profit banks ($p<0.034$) and government banks ($p<0.043$) regarding met criteria determination of monitoring time. No other statistically significant differences were seen among the data.

Table 23 Monitoring Time (percentage)

Monitoring Time	Percent
One Year	6.0
Two Years	0.8
Three Years	4.2
Four Years	4.2
Five Years	59.0
Six Years	1.9
Seven Years	9.0
Ten Years	7.2
Fifteen Years	3.5
Twenty Years	3.5
Perpetual	0.9

Table 24 Entity Determining Monitoring Time (percentage)

Entity Determining Monitoring Time	Government	Private	Non-Profit
Negotiated	14.3	26.5	0
MBRT/Corps	70.0	66.2	63.6
State	4.8	4.4	18.2
Met Criteria	15.0	3.0	18.2

External Validity & Comparisons

The results in this area were very similar to the data acquired by ELI. According to ELI,

"The majority of banks (60%) require monitoring for five years. Twenty-one percent of banks require more than five years with 16 percent requiring between six to 10 years and 5 percent requiring anywhere from 11 to 50 years" (ELI, 2002, 81).

When ELI examined the entity determining monitoring time they found that 12% of banks examined required monitoring until performance criteria were met, 1% until all the credits are sold, and 2% used some combination of these methods (ELI, 2001).

Summary

The results of this research theme were in line with the national guidance for mitigation banks (Federal Guidance for the Establishment Use and Operation of Mitigation Banks, Federal Register 228, 58605-58614 Vol 60, No. 43, 1995) that suggests a five-year monitoring time.

Service Area

Data concerning wetland mitigation banks' service areas were placed within the ATLAS theme "location/service area." The coding process resulted in the emergence of the following service areas categories, "flood plain/drainage basin/watershed", "Hydrologic Unit Codes", "eco-region", "county", "state" and "other."

Qualitative Results

Six (6) codes (see Table 25) were used to capture the range of thematic responses concerning the service area of wetland banks, with the most predominate response

category being "Watershed/drainage basin/flood plain." A typical response within this service area type was, "Well, our service areas here are determined by, well loosely determined by watersheds" (0554). A complete representation of the range of responses can be found in Appendix F, Section 14.

Quantitative Results

An initial analysis of the frequencies in this theme area revealed what looked like more non-profit and government banks reporting their state was their service areas as compared to private banks. It also appeared that more government bank managers mentioned "other" than did private and non-profit bank managers. The pair wise cross tabulation of government, private and non-profit as they relate to service area mentioned was undertaken. It was learned that private banks significantly differ from government banks ($p<0.010$) and non-profit banks ($p<0.010$) regarding the use of states as service areas.

Table 25 Service Area Determination (percentage)

Service area determination	Government	Private	Non-Profit
Watershed	50.0	51.8	46.2
HUC	19.2	31.8	25.0
County	8.0	12.8	23.1
State	7.7	0	7.7
Eco-region	4.0	3.5	0
Other	8.0	0	0

External Validity & Comparisons

The 2001 ELI study found 53% of banks studied using the watershed as the geographic service area which is similar to the above results. However ELI found 22% of banks studied used the county, 11% used a hydrologic unit and 14% used some other type of geographic delineation for a bank's service area (ELI, 2001). The ELI findings

differ as compared to this study's findings with the present study having more banks mentioning hydrologic unit codes and fewer banks mentioning counties as service areas.

Summary

According to this data, in some instances service areas appears to be affected by the ownership of a bank and may indicate a shift toward hydrologic service areas and away from county service areas.

How was the Service Area Determined?

When bank managers were questioned about service area they were also asked to comment on how or who determined their service area. Data regarding this question were also placed within the ATLAS theme "location/service area."

Qualitative Results

Two (2) codes (see Table 26) were used to capture the range of thematic responses concerning how the service area was determined. The most predominate responses were that agencies determined service areas. For example, "Basically, we have a sphere of influence. The regulatory agencies will determine that by how large our watershed is and each mitigation bank has a specific watershed or sphere of influence" (0323). A complete representation of the range of responses can be found in Appendix F, Section 15.

Quantitative Results

Examining who determines the service areas, resulted in an initial analysis of frequencies that seemed to indicate more non-profit banks seem to have their service areas negotiated than do government and private. However, the pair wise cross tabulation revealed no significant differences within the data.

Table 26 Entity Determining Service Area (percentage)

Service Area Determination	Government	Private	Non-Profit
Agency	73.9	72.6	46.2
Negotiated	26.1	27.4	53.8

Summary

This data show that wetland mitigation bank ownership type does not have a significant relationship with how bank service area has been determined.

Success Criteria

Data regarding a bank's success criteria were placed in the ATLAS theme "success criteria." Managers often gave very detailed technical information regarding their own bank's success criteria. Success criteria varied greatly between the different regions across the country. This variation may be attributable to the range and number of eco-regions across the country, as well as the number of agencies involved in the determination of success criteria. The conversational interviews resulted in open discussions regarding whether banks' success criteria were negotiated or determined by the agencies. If it was clear that agencies determined a bank's success criteria, those data were coded "agency." If it was clear that the success criteria were a negotiated component of the permit process, those data were coded "negotiated."

Qualitative Results

Table 27 shows that the predominate response was "negotiated", with these bankers stating things such as the following:

> "There are guidelines and then they make modifications dependent on individual sites. We go in knowing what the guidelines are and then we make modification according to what we think appropriate for the site and the site conditions, and whatever we are restoring or doing on that site and then that's where they are able to make their comments and we respond back and we come to a negotiated decision" (18251).

A complete representation of the range of responses can be found in Appendix F, Section 16.

Quantitative Results

Initial examination of the frequencies for this theme seemed to indicate that a smaller number of private banks rely on negotiation as compared to government and non-profit. The pair wise examination of government, private, non-profit regarding the various mentions of who determined the success criteria revealed no statistically significant differences.

Table 27 Entity Determining Success Criteria (percentage)

Entity	Government	Private	Non-Profit
Agency	28.6	45.7	25.0
Negotiated	71.4	54.3	75.0

External Validity & Comparisons

In 2001, ELI found only two states (Florida and Maryland) that required some form of performance criteria for banks in their statutes and regulations. Only two states (Iowa and Virginia) have performance requirements in banking guidelines (ELI, 2001). ELI used banking instruments rather than conversational interviewing and was able to go in-depth using banking instruments to examine performance standards (vegetation, hydrology or the presence of non-native species). ELI results are not directly comparable with this study's results.

Summary

Success criteria determination does not appear to be affected by ownership type. It also seems that success criteria determination for mitigation banks is usually a negotiated process. This is an interesting research result since a negotiated process may provide evidence both bankers and agencies have access to a great deal of knowledge about the ecology of wetland banks. Or this my simply signify the difficulty in determining a wetland mitigation bank's success criteria.

Agency Support

Bankers' opinions on the level of support they received from agencies during the banking process were coded in ATLAS as "interaction with agencies." Agency support was difficult to simplify into categories, with managers often speaking at great depth about the amount of support they did (not) receive. Two categories were used to describe the mangers' opinions of agency support, "not very supportive" and "very supportive."

Qualitative Results

The most prevalent response among all bank ownership types was "very supportive." Managers generally felt that the overseeing agencies had been very supportive in the banking process. One manager reported that,

> "I'd say very supportive. They've been encouraging us for a number of years to get into the banking business. They have a firm grasp of that there's real ecological benefits into mitigating a small impact at a large site. The success is so much better; it's so much more an efficient use of taxpayer dollars so they've been very supportive" (07103).

A complete representation of the range of responses can be found in Appendix F, Section 17.

Quantitative Results

Table 28 shows most managers felt the agencies had been very supportive in the banking process. Pair wise cross tabulation of government, private and non-profit bank type with agency support confirmed there was no statistical difference regarding the amount of perceived agency support.

Table 28 Perceived Level of Agency Support (percentage)

Agency Support	**Government**	**Private**	**Non-Profit**
Very Supportive	89.5	77.0	88.9
Not Very Supportive	10.5	23.0	11.1

Summary

This data show (1) ownership type is irrelevant in relationship to perceived agency support and (2) a majority of bankers generally feel the agency staff support them in their banking endeavors.

Clients of bank

Data regarding the clients who used wetland banks were classified within ATLAS as "users of credits." This theme area captured information on both the type of clients and number of clients of wetland banks. The data analysis assigned values of "mostly private", "mostly public" and "50/50 public/private split" as a way to characterize the mix of client types.

Qualitative Results

Three (3) codes (see Table 29) were used to capture the range of thematic responses concerning the banks' clients. The most predominate value was mostly private and can be represented with the following quote: "I'd say 99% is private, I do very little like with the state" (12142). A complete representation of the range of responses can be found in Appendix F, Section 18.

Quantitative Results

Initial examination of the frequencies regarding the type of wetland bank clients shows fewer government banks reporting to have mostly private clients. It also seems that fewer private banks reported having mostly public clients than did government and

non-profit banks. Further analysis revealed private banks to significantly differ from government ($p<0.000$) banks regarding the predominance of public clients. Not surprisingly, government banks significantly differed from private ($p<0.000$) banks regarding the predominance of private clients and significantly differ from non-profit banks ($p<0.011$) regarding the predominance of public clients.

Table 29 Clients of the Wetland Mitigation Banks (percentage)

Credit Clients	Government	Private	Non-Profit
Mostly Private	21.1	71.8	53.8
Mostly Public	78.9	14.3	33.3
50/50 Private/Public	0	13.0	15.4

Summary

The results in this area make sense. Government banks tend to be used for government projects. The collection of exact number of clients was beyond the scope and capability of this study. Most managers did not know exactly how many clients they had. Often it was only those managers that were either relatively new or had not sold credits in a considerable amount of time that could report on the exact numbers of clients. The probative questions regarding the type or size of client resulted in learning that departments of transportation (DOTs) were typically the largest clients and private homeowners the smallest clients.

How do bank managers get their clients?

Bank managers were also asked about how they generally attract their clients. Data in this theme were coded in ATLAS as "clients coming from." Responses included: "consulting firm referrals", "agency referrals", "direct marketing", "they were the only bank available", or "the bank had been only for their use."

Qualitative Results

Five (5) codes (see Table 30) were used to capture the range of thematic responses concerning how bank managers get their clients. Most clients, it seems, were a result of "agency referrals." A typical response in this area was, "[b]ecause of that credibility with the agencies about 75% of our clients are referrals from the agencies and 25% are referrals from engineering firms and consulting firms" (0554). A complete representation of the range of responses can be found in Appendix F, Section 19.

Quantitative Results

Table 30 shows that most bankers credit "agency referrals" as the source of their clients (54.4%), with "direct marketing" (22.9%) and "only for their use" (20.1%) as the next largest sources of wetland bank clients.

Table 30 Source of Wetland Mitigation Bank Clients

Source of Clients	Percent *
Agency referrals	54.4
Engineering/consulting firm referrals	12.0
Direct marketing	22.9
Only bank available	6.0
Only for their use	20.1

* Does not total 100% due to multiple responses

Summary

These results show most bank clients are directed to banks from agency referrals, which was expected, considering the interrelated aspects of permitting and mitigation.

Reasons for using the particular banks

Data regarding the reasons that bankers attributed to their clients use of their banks were coded within ATLAS as "reason for using the bank." While bankers described how their bank was the "only available bank" or that they had the "best reputation" or were probably the "cheapest" in the area, bankers for the most part did not talk about what made clients choose THEIR particular bank. That is, most bankers credit section 404 permitting or regulations (wetlands law and regulation) as the reason for using their wetland banks.

Qualitative Results

In total there were seven (7) codes (see Table 31) used to capture the range of thematic responses concerning reasons for using a particular bank. The most predominate comment was "agency regulations" and the following is a good representative quote of this type of response:

> "We've use the bank for both 404 permit mitigation condition requirements for mitigations for corps permits. We've used it for section 401 water quality certification permit mitigation. We've used it for violations" (0316).

A complete representation of the range of responses can be found in Appendix F, Section 20.

Quantitative Results

As can be seen in Table 31, "regulations" was the most frequent respondent (49.1%).

Table 31 Reasons why Clients use Particular Wetland Mitigation Bank

Reasons for Using	Percent *
Regulations	49.1
Available	22.4
Cheapest	25.4
Reputation	10.6
Convenient	6.5
Fast to process credits	3.0
Other	3.3

* Does not total 100% due to multiple responses

Summary

The high number of bankers reporting regulations (404 permitting requirements) might reflect the misinterpretation or difficulty with this question. It would be interesting to gather more information at a future date regarding this question.

Bank Comparisons

Wetland bank managers were asked to comment on how their bank compares to others in the region and that information was placed within the ATLAS theme "comparing banks." The information collected under this theme was grouped into the following categories: "similar" (type/ size/ ecology), "none" (no banks around), "different type (owner/size/ecology)", "cheaper", "more expensive", "not as good" (ecologically/interaction with agencies) and "more than one response." (banker gave more than one of the previous responses). "Similar" represents the manager's belief that banks in the area are similar to the bank managers. "Different type" refers to managers expressing other banks were owned by other types (government, private, non-profit) or of different size. "Cheaper" or "more expensive" refers directly to the difference in credit prices. "Not as good" meant the ecological situation of the banks surrounding theirs was

better/worse or they had heard stories or knew they had a better/more difficult time dealing with agencies. Finally they could have commented on the fact there were no other banks around to make a comparison ("none") or they could have given more than one comparison and were thus coded as "more than one response."

Qualitative Results

The seven (7) codes (see Table 32) used to capture the range of thematic responses concerning the comparison of other wetland banks revealed that most bankers believe that their bank is of a "different type" than others in the area. There were two types of responses typical for this category as illustrated below:

> "For the most part [it] is pretty much the same, but it is different in the sense that they, what they are going to be left with is herbaceous where a lot of our stuff is forested" (0545).

> "The main difference is that ours will be exclusively for transportation uses by public agencies" (07103).

A complete representation of the range of responses can be found in Appendix F, Section 21.

Quantitative Results

Table 32 shows that, for the managers able to compare their bank to others, the highest percentage reported the banks around them to be of a different type (31.2%).

Table 32 Comparison of Mitigation Banks

Comparison	Percent •
Similar	23.1
None	18.2
Different Type	31.2
More Expensive	3.3
Not as good	16.4
More than one response given	5.3
Cheaper	2.3

Summary

This is a difficult theme to make any strong observations since many managers didn't know how to make comparisons of other banks and would often struggle with this question. Also this question is difficult to make any comparisons since no other study asked this type of question in this way.

Keys for successful wetland banking

The keys to successful wetland banking identified by bank managers fell into a range of types. These key types included:

- "technical knowledge", referring directly to the need for wetland ecology information;
- "site selection", referring directly to good soil and hydrology;
- "agency support", referring directly to both support in the process of building the bank as well as support in using the bank once built;
- "design", referring directly to the landscape design of the site;
- "commitment", referring to monitoring and willingness to give time to the project;
- "demand", referring to the need for credit demands;

- "hydrology", referring directly to the hydrology on the site;
- "money", referring to starting capital and enough money to keep a project going;
- "nature", referring to no storms, droughts or other major disasters that would destroy the bank once built;
- "patience", referring to the direct use of the word patience by the respondent or their reference to giving the bank time to succeed;
- "other", was various other keys to success not fitting into one of these value groups.

Qualitative Results

Eleven (11) codes (see Table 33) were used to capture the range of thematic responses concerning wetland bank managers' opinions on their "keys to success," the most frequent comment varied based on bank ownership type. Representative quotes of the top three comments are:

> "Agency Support": "Having agencies supporting banks and allowing clients to access banks as a primary option to do their mitigation so there's adequate sales potential so a bank is economically viable" (24295).

> "Site Selection": "Site selection, you have to have a really good defensible site that's able to provide the functions you think it will" (32373).

"Hydrology": "[A] Decent design and one that will establish the appropriate hydrology. Without hydrology you're dead" (09110).

A complete representation of the range of responses can be found in Appendix F, Section 22.

Quantitative Results

Initial analysis of the frequencies revealed what looked like more non-profit banks having mentioned technical knowledge, hydrology, money, design, patience and other than did private and government. Site selection, commitment and agency support appeared to be mentioned by more government than private and non-profit wetland bank managers. Demand and nature appeared to be mentioned by more private than government and non-profit. Pair wise cross tabulation of government, private and non-profit, as they related to the key to successful wetland banking mentioned was undertaken. Indeed, private banks did significantly differ from government ($p<0.044$) and non-profit ($p<0.044$) banks with regard to the role of hydrology as a key to success. Non-profit wetland banks significantly differ from government ($p<0.004$) and private ($p<0.027$) banks when identifying agency support as a key to success. It was also learned that private wetland banks significantly differ from non-profit ($p<0.001$) but not government ($p<0.070$) banks when attributing money as a key to their success. Government bank managers significantly differed from non-profit ($p<0.042$) but not private ($p<0.086$) wetland bankers regarding the role of site selection as a key to success.

Finally private bank managers significantly differed from non-profit ($p<0.027$) but not to government (0.818) with regard to technical knowledge.

Table 33 Keys to Successful Wetland Mitigation Banking (percentage*)

Keys to Success	Government	Private	Non-Profit
Technical Knowledge	17.2	15.5	41.7
Site Selection	48.3	30.9	15.4
Agency Support	44.8	28.1	0
Design	13.3	13.4	16.7
Commitment	26.7	15.5	25.0
Demand	10.3	24.0	8.3
Hydrology	20.0	7.2	25.0
Money	13.3	4.1	30.8
Nature	3.4	9.3	0
Patience	3.4	6.3	7.7
Other	13.8	15.6	25.0

* Does not total 100% due to multiple responses

Summary

The results of statistical data analysis show the initiating entity of a bank is significant. More governments and non-profits see good hydrology as a factor that leads towards success than do private banks. Also, non-profits do not seem to be relying upon agency support as a key for success as compared to government and private wetland banks. The results also show that private wetland bankers feel less strongly than non-profit bankers, but not significantly different from government bankers, that money is a key to success. Government bankers attribute success to site selection more than non-profit bankers but not significantly different from private bankers.

Obstacles to Wetland Banking

Obstacles to wetland banking were coded into the following values:

- "In lieu fee" was a direct reference to in lieu fee programs for mitigation;

- "requirements/regulation changes" refer to the constantly changing regulations as well as wetland banks often having higher standards for success than on-site mitigation;
- "money/cost" is a direct reference to the cost of mitigation projects;
- "public perception" is in regards to both the public's view of mitigation banks and wetlands in general;
- "landowners" refers to those who will not allow their land to participate in mitigation banking programs;
- "right site" refers to finding the right site including the right soils and hydrology;
- "agency support" refers to agencies working with the development community to support the use of banks once built;
- "time" is simply the amount of time it takes to process a bank and get it up and running;
- "inexperience of agency" refers to a consistent turn over in staff (managers mentioning this obstacle often spoke of time spent educating agency staff);
- "agency agreement" is a direct reference to the numbers of agencies involved in this process and their need to agree;
- "competition" is simply a reference to the other banks out there competing for credit sales;
- "science/nature" is a reference to knowing the ecology behind the process and/or the natural disasters that could ruin a bank.

Qualitative Results

Fifteen (15) codes (see Table 34) captured the range of thematic responses concerning the obstacles to wetland banking. The most frequent comments by governmental banks concerned finding the right site (23.3%), private bankers reported difficulties with regulations/requirements (26.8%) most frequently, and non-profit wetland mitigation bankers mentioned difficulties with science/nature (38.5%) most frequently. The following are representative quotes of these three types of comments:

> "Right Site": "Site selection trying to find the appropriate site that's, we are still looking for 2 to 3 and we are just having trouble finding the right place to do it" (25302).

> "Requirements/Regulation Changes": "Mitigation banking has very high standards...we are happy to live by them. The problem is that individual mitigation banking today, in lieu fee accounts sometime advanced mitigation, sometimes don't have those same standards and when we as bankers have to live by a certain standard that no one else does, it makes it very difficult to compete against in those situations" (0320).

> "Science/Nature": "I think our knowledge of these systems is still left incomplete" (12160).

A complete representation of the range of responses can be found in Appendix F, Section 23.

Quantitative Results

The pair wise cross tabulation of government, private and non-profit, as they related to the obstacles to wetland banking mentioned was undertaken. Non-profit banks significantly differed from private ($p<0.002$) and government ($p<0.032$) banks in reporting science/nature as their primary obstacle. Non-profit banks significantly differed from government banks ($p<0.030$) when attributing competition as an obstacle but did not differ from private banks ($p<0.093$) in this regard. Interestingly, non-profit banks significantly differed from government banks ($p<0.024$) but not private banks ($p<0.072$) in reporting no major obstacles to wetland banking.

Table 34 Obstacles to Wetland Mitigation Banking (percentage *)

Obstacles to banking	Government	Private	Non-Profit
In lieu fee banking	0	8.2	0
Regulations/requirements	20.7	26.8	16.7
Money	16.7	10.3	7.7
Public Perception	6.9	3.1	0
Landowners *	10.0	3.1	0
Right Site	23.3	13.5	0
Agency Support	6.9	20.6	0
Time	16.7	9.4	16.7
Inexperience of Agency Staff	3.3	6.3	15.4
Disagreement within agencies	16.7	11.5	15.4
Competition	0	4.1	15.4
Science *	10.3	8.3	38.5
Risk	10.3	6.2	0
Other	6.9	13.5	16.7
None	0	4.1	16.7

* Does not total 100% due to multiple responses

Summary

The large number of non-profit bankers mentioning science/nature as an obstacle to banking might reflect an absence of specialized knowledge of wetland ecological science.

However, it may also relate to other phenomena not fully understood. It is not surprising that a large number of managers raise regulations/requirements as an obstacle to banking. This is a regulated market and agencies are charged with the task of protection ecosystems and ecosystem services, not necessarily with making the construction and operation of wetland banks easy.

External Validity & Comparisons

The high percentage of managers in this study mentioning regulations/ requirements as an obstacle for banks is consistent with the recent study in Florida by the Corps which commented that bankers "express frustration that the regulatory regime continues to favor on-site mitigation in the face of overwhelming evidence of its widespread ecological failure in Florida and contrasting evidence of the success of mitigation bank projects" (Scodari, ACOE, 2001, 34). Some bankers in this study as well as those in the Florida study also mentioned 'in lieu' fee programs. Bankers expressed frustration with in-lieu fee programs in Florida and pointed to the fact they create unfair competition for mitigation banks (Scodari, ACOE, 2001).

The research reported here found 16.7% of government and non-profit bankers mentioning time as an obstacle to bringing a bank on line. Time was also mentioned in the Corps Florida study. Like in Scodari (2001) bankers "expressed frustration over the extended Federal timeframe for bank development and approval. They feel that the Federal process is inefficient and characterized by unnecessary delays" (Scodari, ACOE, 2001, 19). It appears that time is a factor all over the country when dealing with obstacles to banking.

Also, this project's results concerning the inexperience of agency personnel was raised in the Florida study. "Bankers contend that the multi-agency nature of the MBRT makes navigation of the bank development process more difficult and time-consuming than it need be" (Scodari, ACOE, 2001, 20). The reasons for the lack of training on the part of the agency personnel and MBRT given by managers in this study and reported in the Florida study include high turn-over of staff.

Change One Thing about Wetland Banking

The theme "change one thing about banking" was assigned to information collected from wetland bank managers about their suggestions for making the wetland banking system better. The categories used to code this information were:

- the amount of "time" it takes to get a bank up and running;
- the "higher standards" mitigation banks must follow (compared to on-site mitigation);
- the amount of "money" necessary for these projects;
- the need for "banks to be used more often/first" for mitigation needs;
- an end to "in lieu fee" banking in this country;
- the method used to create service areas or the size of "service areas";
- the "requirements" for banks and the process banks must go through in order to get permitted;
- the need for "agency agreement" in order to move forward with a bank;
- "natural" a wish wetland mitigation banks could be built in a more natural way; and

- "other" for things some managers identified a change that did not fit into other grouping.

Qualitative Results

Eleven (11) codes (see Table 35) were used to capture the range of thematic responses concerning what bank managers would change about wetland banking. The most frequent response concerned the amount of time it takes to form a bank and can be represented by the following quote: "I'm not sure. I guess it would be the time for approval and the Corp of Engineer's time they give permits. I wish it would go faster" (29332). A complete representation of the range of responses can be found in Appendix F, Section 24.

Quantitative Results

Table 35 shows that 21.2% of all bankers interviewed would like to change the amount of time it takes to bring a bank on line. This was followed closely by a desire to change the high standards that bank mangers perceive they must meet (20.8%).

Table35 The One Thing Managers would like to Change about Wetland Mitigation Banking

Item wished to be Changed	Percent *
Time it takes	21.2
High standards held up to banks	20.8
Amount of money it takes to form a bank	5.1
Like to see banks used more as a first choice with agencies for mitigation	12.3
End to in lieu fee banking	5.8
Nothing they would like to change	6.1
Service areas	6.8
Requirements of the banks or the process they had to go through as a whole to form a wetland bank	8.1
Agencies not agreeing	5.7
Other	14.1
Wished more banks were more natural	4.9

* Does not total 100% due to multiple responses

Summary

Many of the desired changes expressed by bank mangers were expected. These included comments such as the amount of time it takes to bring a bank on line and the desire to use banks more for mitigation projects. One interesting and logical observation in this data is the fact that the most mentioned desired changes (amount of time and high standards) were also frequently mentioned as obstacles to banking.

Conclusion

The systematic coding of the interview data enabled useful insights to be drawn from the collected data. Furthermore, the statistical analysis of the data enabled the testing of apparent relationships between bank ownership and key study variables.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

Summary

The objective of this study was to learn about the nation's wetland mitigation banking industry from banker's perspectives. To achieve this objective, more than 140 wetland mitigation bankers responsible for 226 wetland mitigation banks were interviewed. These interviews were in-depth, semi-structured interviews designed to learn about the details of wetland mitigation banks and bankers' experiences from bank sponsors and managers in their own words.

The sample population selected for this study was obtained from a 2002 listing of all known wetland mitigation bankers (Morzillo, 2001). The study sample was stratified across state locations with a total sample size of 140 bankers; this list comprised of 59% of known wetland banks and 56% of known bank managers. The vast majority of the in-depth interviews were tape-recorded and subsequently transcribed. There were more than 1800 pages of transcripts produced from these interviews. These transcripts were inputted into ATLAS ©, a qualitative data analysis software, and later iteratively coded (Corbin and Strauss, 1998) for emerging themes. These themes were analyzed both qualitatively (with use of ATLAS © software) and quantitatively (with use of SPSS software).

Implications of Findings

The data and analysis presented in Chapter Four demonstrates the range and depth of information learned about the nation's wetland banks and bankers.

Some key findings and their implications include:

- The nation's banks are composed mainly of private entrepreneurial banks (69.3%). Most bankers are male (90.3%), many have their bachelor's degree (50.3%), and most have 5 or more years experience working in the banking industry (80.9%). On average, managers have been working in the banking industry for 9.08 years.

These types of results are not surprising and are in line with prior studies which show private entrepreneurial banks as the growing trend in the banking industry. The data regarding the amount of time the banker has been working in the industry could not have been predicted from previous studies. Most bankers possess five or more years in banking and the industry does not appear to be growing.

- The highest number of bankers reported the ecosystem of their bank as "varied" (31.2%). This was followed closely with bankers reporting their wetland banks to be "bottomland hardwood" (28.0%).

This study supports the idea that varied wetland mitigation bank types are viable. It is also clear the proportion of the nation's bank types is highly influenced by various eco-regions of the nation.

- A large portion of the nation's wetland mitigation banks were found in the New Orleans Army Corps of Engineers District (20.5%). Other frequently reported districts were Jacksonville (9.2%) and Norfolk (9.4%). These results corresponded to the states with the highest reported number of wetland mitigation bank operations; Louisiana (20.5%), Florida (9.2%) and Virginia (8.7%).

This result was expected based on prior understanding of the wetland banking industry. Many banks tend to be located in the south eastern part of the country and other heavily populated wet areas.

- Banks were found to range in size from a reported specific size of 0.50 acres to a reported average size of 48,000 acres. Some bankers had so many banks they would often report just an average size for their banks.

This confirms the idea banks are of various sizes throughout the nation. The inability of managers owning several banks to report all bank sizes during the open conversational interview, show this method was not the best to obtain precise national bank size data.

- Many bankers reported having no proposed new banks or bank expansions (government, 40.9%; private, 67.6%; non-profit, 66.7%). Statistical significance was examined among bank ownership in relation to whether a bank was proposing zero new banks or one or more bank or bank

expansion. Results revealed private banks are significantly more likely to not have any proposed banks when compared to government banks.

A large number of bankers have no plans for new banks. Therefore, it seems that the wetland banking industry may be slowing down. Various factors may explain this; a slowing economy, saturation of the market, and/or decreased demand.

- The most frequently reported purpose of banks varied dramatically by ownership type with government reporting "specific project" (75.9%), private reporting "profit" (46.4%) and non-profit reporting "environmental" (75.0%).

The statistically significant differences show private and non-profit bankers to be more interested in profit compared to government bankers while showing non-profit bankers to be more interested in environmental purposes compared to government bankers. When bankers mentioned a specific project it was almost always a government banker. Government bankers were also less interested in market demand for their services than other types of bankers. This confirmed the belief that governmental wetland banks generally focus on the production of wetland credits for their other projects.

- The number of wetland bank managers reporting their bank to be in the monitoring phase was also high (government, 89.7%; private, 86.6%; non-

profit, 100%) for all ownership types. However statistical differences were found.

The analysis revealed more government banks to be in the bank construction phase than private but not non-profit wetland banks. Once again, the inference may be drawn that government banks lean toward creating their own wetland banks instead of buying credits from private commercial bankers.

- Most bankers reported their bank's creation process was to restore former wetland acreage (73%).

This confirms previous research and the idea that reconstituted wetlands may be easiest and most effective for creating wetland mitigation banks.

- A large percentage of bankers (75.8%) reported their current wetland mitigation bank site was originally in agricultural use.

This is not surprising since historically many wetlands were drained for agriculture uses. Furthermore, marginally productive agricultural lands that were once functioning wetlands may be among the most least costly acreage to purchase and transform into functioning wetlands.

- Data regarding credit calculation revealed 88.9% of government, 82.3% of private and 100% of non-profit bankers receive their allocation of mitigation credits for their banks based on an agency determination.

Bank ownership appears to have no clear effect on credit calculation method. Since the data reveal agencies determine a bank's allocation of credits, it appears the national banking industry has a uniform approach regarding the process of who calculates wetland credits.

- The method used most frequently for credit amount determination was acre/type (49.3% of all banks), and this hold true for the results based on ownership type with 52.0% of government, 44.3% of private and 75.0% of non-profit using an acre/type method.

While agencies may be doing the credit calculation across the industry, the methods used by those agencies varied. Examination of the data revealed that non-profits using acre/type methods to be statistically different from the number of private banks using acre/type methods. Since acre/type methods are arguably more ecologically sound, this result might suggest non-profit banks' increased interest in an environmental purpose for their banks. Other than the fact more non-profits are using acre/type methods, this data would again appear to demonstrate fair and equal treatment throughout the banking industry.

- Credit prices ranged from $1000 per acre to a $900,000 per acre. Most banks reported the range for their credit process with the average of the low end of the range being about $43,519 and the average of the high end of the range being about $93,873 with both figures exhibiting considerable variation.

Credit price is significantly affected by location within the country. The method used to report credit price also appeared to vary based on location. The data confirmed this and also revealed a large variation in credit prices throughout the country.

- Statistical analysis of the data revealed the amount of credits released upon entering into a banking agreement differed by ownership type. The most frequently reported percentage of mitigation credits released varied with 45.0% of government banks receiving zero credits, 31.7% of private banks receiving between 1-29% of their credits, and 30.8% of non-profit receiving between 30-50% and 100% of their credits at the time they entered into banking agreements.

As with other aspects of contracts, in general, banking agreements may reflect a significant amount of negotiation, in particular, concerning the amount of credits released at the time the parties enter into the agreement. The analysis revealed that more private and non-profit wetland banks receive 100% of credits than government, supporting the idea that more non-profit and private mitigation bankers need the ability to raise capital

through the sale of credits at the beginning of a banking project than do government entities. Further supporting this idea, it was observed that more government banks reported zero credits being released as compared to private banks.

- The theme used to investigate the availability of future funds for bank use after wetlands were established revealed a fairly even split between wetland banks that said that they would have money available for the bank in the future and those that reported that no money will be available for the bank in the future. This split was seen across all ownership types (government, 54.5% yes; private, 53.3% yes; and non-profit, 44.4% yes).

It is not clear what this result means. There does not seem to be uniform standards across the wetland banking industry concerning the availability of funds for use by banks once they have been completed. While there are a range of wetland banks with some perhaps needing and others not needing funding for future maintenance, statistical analysis did not reveal statistically significant difference between bank ownership with respect to availability of future funds for bank maintenance after bank completion.

- Most wetland bank managers reported that their wetland bank property was going to remain under their ownership (government, 52.2%; private, 41.0%; and non-profit, 66.7%). However, there were statistically significant differences found among the different ownership types concerning the future disposition of wetland banking land.

The results show high percentages of each ownership type planning to continue to own the land. This contradicts the hypothesis that bank managers want to separate themselves from the bank land after all profit had been gained.

- The most reported permit processing time was four years across all bank ownership types (government – 34.8%, private – 23.3%, non-profit – 45.5%). On average, permit times were reported to be 4.27 years.

The fact the most frequently reported permit time was four years for all ownership types signals that wetland bank permitting is a time consuming process and perhaps some additional standardization in the permit process may be helpful to both applicants and review agencies. There is no published guidance on permit application time requirements. However, bankers will appreciate the research finding that permit approval times do not appear to differ based on ownership type.

- The United States Fisheries and Wildlife Service (FWS) was the agency most frequently mentioned by respondents as being problematic.

This information was volunteered by respondents during the conversational interview as being a difficult part of the permitting process, not as a response to a direct question. However, it is not surprising that the FWS, an agency charged with protecting species and habitat, might be perceived as making the permit process more complicated or expensive than wetland bankers might like.

- Bankers' reported costs of creating wetland banks was extremely varied and difficult to report.

Cost of creation varied considerably. This variation may reflect both various eco-regions (regional differences in land acquisition costs, wetland creation costs) as well as the inaccuracy in reported cost of creation figures. Obtaining an exact figure regarding this cost often proved difficult as managers accounted for various creation cost (land, construction) and often did not know cost of creation figures during the interview process.

- Monitoring information obtained from wetland bankers show that most banks have a five year monitoring schedule (59.0%). In aggregate, the agency most frequently reported to be responsible for monitoring was the Mitigation Banking Review Team/Corps (government, 70.0%; private, 66.2%; and non-profit, 63.6%). Examination of the data revealed significant differences among ownership type only existed within the mention of "met criteria."

The amount of monitoring time required for wetland banks was as expected based on the EPA/USACOE national guidelines for wetland mitigation banking. However, the entity that determines the monitoring appears to differ significantly based on bank ownership type. More non-profit and government banks have their monitoring time

requirements determined by meeting criteria. This might reflect more of an ecological purpose to banks established by non-profit and government organizations.

- Information about the determination of wetland bank's service areas revealed that most banks' service areas have been determined based on the banks' watershed/drainage basin/flood zone (government, 50.0%; private, 51.8%; non-profit, 46.2%). However significant differences were observed between different ownership types.

More government and non-profit banks reported being able to use their entire state for their service areas as compared to private bankers. This may reflect denser populations and development pressures associated with regions supporting private banks as compared to government and non-profit banks. However, the data does show the largest percentage of banks regardless of ownership type reporting their service area to be based on watersheds.

- Data revealed the highest percentage of all ownership types (government, 73.9%; private, 72.6%; non-profit, 46.2%) had agencies determine their service area. No significant differences were seen within the data.

The data show that agencies play a significant role in delineating banks' service areas. It also shows that bank ownership type does not seem to be a significant factor in this determination.

- Success criteria were negotiated in 71.4% of government banks, 54.3% of private banks, and 75.0% of non-profit banks. No statistically significant differences based on ownership type were found.

The results show that wetland banks' success criteria may be heavily negotiated. This is a logical since success criteria are extremely varied, based on ecological, and other factors that may be site and regionally specific.

- The vast majority of all wetland bank managers, regardless of ownership type, felt that agencies had been very supportive in the permitting process (government, 89.5%; private, 77.0%; non-profit, 88.9%). However, as mentioned above, the one agency mentioned as being more difficult to work with was the US FWS.

This result shows that most bank managers are pleased with the support they have received from regulatory personnel. The result demonstrates that agency staff members are perceived as non-biased when working with various type of bank owners.

- The predominate clients of wetland banks varied based on the banks' ownership type. Government banks reported mostly public clients (78.9%) with private (71.8%) and non-profit (53.8%) banks reporting to have mostly private clients.

These data are not surprising and reflect the general character of the wetland banking industry.

- Most bankers reported that the source of their wetland bank clientele was agency referrals (54.4%) with direct marketing (22.9%) as the second most frequent source of clientele.

This result was expected as the literature shows that it is a general practice in the banking industry to rely on agency referrals' to get mitigation clients. However, what was not expected was the relatively high number of bankers using direct marketing techniques to acquire clients.

- Bankers reported that regulations (49.1%) were the primary reason for clients using a particular bank.

It would have been nice to learn more about what other factors bankers attributed to clients' choices. This may be an area where future research would be warranted.

- When asked to compare their wetland bank to others in their region, bankers most frequently responded that the other bankers were of a "different type", whether owner, size, or ecology (31.2%). Most bankers

reported information only very generally on this subject providing little specifics about the banks around them.

Since most wetland bank managers reported that wetland banks around them to be different in some way, it is possible that most managers feel that their banks are somewhat unique. However, it did seem during the interviews that many respondents had difficultly answering this question and often could not provide specific details about the other banks. This may show managers are not very knowledgeable about other banks near them or, perhaps, may show a reluctance to reveal market information.

- The most mentioned key to success raised by wetland mitigation bankers varied depending on bank ownership type. Government bank mangers reported "site selection" (48.3%) and "agency support" (44.8%) most frequently. Private wetland bank managers reported "site selection" (30.9%) and "agency support" (28.1%) as most important. However, non-profit wetland bank managers reported that "technical knowledge" (41.7%) and "money" (30.8%) as the most important keys to their success.

Statistical analysis seemed to reveal that government and non-profit bankers measure success to include hydrological factors more than private bankers. Private and government wetland bankers were more concerned with site selection of the wetland mitigation bank as a key to success.

- The most frequent key obstacle to wetland banking raised by government bankers were the selection of the "right site" (23.3%) and "regulations/requirements" (20.7%). Private wetland bankers' top two obstacles were "regulations/requirements" (26.8%) and "agency support" (20.6%). Non-profit wetland bank managers' most frequently mentioned obstacles were issues related to the "science" (38.5%) of wetlands followed by "none", "other", "time", and "regulations/requirements" (all 16.7%).

The statistical analysis of the data revealed non-profit bankers to be more concerned with wetland science issues than other types of bankers. This is in line with some previous research that suggests non-profit bankers tend to be more concerned with the ecological function of wetland banks than other types of bankers. Non-profit bankers also appear more concerned with competition for wetland credits compared to government bankers but not when compared to private bankers. The data regarding perceived major obstacles reveals there is huge potential for increased cooperation between wetland mitigation bankers and regulators. Knowing many bankers perceive their interaction with agencies (regulations, agency support, inexperience of agency staff, and disagreement within agencies) as major obstacles to banking could help improve communication between the two parties. The fact so many bankers appeared to view the regulations currently in existence as an obstacle to banking (i.e. the steps a bank must go through to be permitted) is also an interesting study result.

- The data highlighting changes that wetland bank managers would like to implement in their industry revealed that 21.2% of all bankers interviewed wished to change the amount of time it takes to bring a bank on-line, 20.8% wished to change what they perceived as more demanding standards for wetland banks as compared to wetland mitigation performed on site of a wetland impairment.

While a desire for expedited credit sales was expected based on prior research, it is not something likely to be changed soon. The wetland mitigation banking process is time consuming for many involved. The recognition of such issue by local, state, and federal agencies may be a first step in restructuring the industry and making wetland mitigation options more efficient and effective.

Study Method's Reasonableness

The use of in-depth, semi-structured interviews proved quite effective for learning about wetland mitigation banking from the perspective of wetland bankers. Possible biases on the part of the researcher and participants that are noted in the literature have been addressed by, among other things, careful selection of participants, emphases of honesty, anonymity and confidentiality, and establishment of trust between the researcher and the participant (Gelling, 2003). The study implementation design of pre-interview communication, informed consent procedures, and a conversation style interview helped to address potential bias.

The study's internal validity was advanced by training of the interviewer and the use of the same researcher for interviews, coding, and analysis. Furthermore, the entire study process was supervised by the researcher's major professor and approved by her advisors. Reliability of the data itself was assured by tape-recording all interviews, transcribing all interviews, using an iterative, evolving discussion guide, and asking respondents to explain their responses or repeat/confirm their previous answers. Such a process enabled the researcher to identify strengths, weaknesses, redundancies, and needed changes in the interview guide as the study made progress.

This research took longer to execute than a closed question survey but was preferred to increase internal consistency by using the same interviewer, collecting data during one relatively concentrated period of time, and randomly selecting a stratified sample of participants. The studies results were examined for external validity by comparing them to previous research that used different data collection methods (e.g., ELI 2002; Scodari, ACOE, 2001). The results of this study's flexible interviewing appear robust and valid as well as in line with previous research on the strengths of such approaches (Schober and Conrad, 1997).

Research Limitations

No research project is perfect. Some potential weaknesses in the reported research include the following limitations:

1. The wetland bank master list used to draw the study sample was compiled in 2001. That list may not be as current or complete as possible. Other banks and managers may have come into existence.

2. By focusing on collecting information from 140 wetland bankers, the interviews by necessity had to be less in-depth and detailed than a study design calling for fewer but lengthier in-depth interviews. The semi-structured interviews did allow for the collection of a depth of information that exceeded that of typical closed-ended survey questionnaires.
3. The nature of the wetland banking industry as a competitive industry as well as the diverse nature of bank managers made it difficult to reach some mangers and to obtain certain information from other managers.
4. The reported research presents no information on the characteristics of the non-respondent population and how or if they differ from the respondent population.

Recommendations for Future Research

While conducting this research, ideas for additional research emerged. Some ideas for further study:

1. Differentiating bankers' views about the amount, type, usefulness, and frustrations with agency support regarding the creation and maintenance of wetland banks.
2. More and better investigation of the details and problems associated with calculation of wetland mitigation credits.
3. Investigation using agency documents and/or agency interviews of the amount of wetland mitigation fulfilled by the use of mitigation banks.

4. Use of the study's current data to do a more qualitative analysis and presentation of such complicated themes as interaction with agencies.

Concluding Remarks

The results of this study indicate wetland bank managers are knowledgeable regarding their banks and the banking process. Bankers, in general, are concerned about making positive environmental contributions with their wetland mitigation banks and seem concerned with current industry practices.

Most wetland bankers manage private banks, are male, and have education and experience related to the banking industry. Many banks are located in highly populated wet areas of the country and are of various sizes and ecological types. The results also show a possible slowing of the banking industry with a high number of bankers planning no new banks or expansions and with most banks established and in the monitoring phase.

Previous research demonstrates mitigation banks do have higher performance standards compared to other forms of wetland mitigation. It became clear that some managers were very concerned about the lack of agency support for using wetland banks in lieu of poorly performing "on-site" mitigation. However, when asked directly about overall agency support, a very large percentage of wetland bank managers reported the agencies to have been very supportive.

A frequently reported obstacle to permitting a wetland bank was the time element. The time it takes to permit a wetland bank was also the issue the bank mangers would most like to see changed. This is an expected research result as the process to permit a

bank is known to be tedious and time consuming. However, creating a wetland is not easy nor is it speedy.

This research also revealed that wetland bankers have acquired a reasonable set of ecological (technical) knowledge of the nation's wetland ecosystems. For example, wetland bank managers typically use marginal agricultural land to reconstitute the wetlands they once were for banks. This demonstrates their understanding of the ecology involved in creating a new bank, past success of this practice, and a relatively low cost mechanism for restoring wetland ecosystems. Finally the amount of banker involvement in service area and success criteria determination also appears to demonstrate increasingly ecologically savvy managers.

The differences in the amount of initial credits released for sale by wetland bank managers at the time of entering into wetland banking agreements varied by bank types. The data showing an even split in the availability of future funding of wetland banks is most probably attributed to the varied ecologies and maintenance needs of banks. However, the project did reveal a relatively high number of bankers committed to future bank maintenance as well as a high number planning to retain their bank land.

Finally the research revealed that most bank managers only gave the most general information regarding other banks in their region and area but did not offer detailed comments or descriptions. This may be due to the fact they did not want to speak of other banks or they simply did not know any information on other banks.

The examination of wetland mitigation banks through direct conversational interviews with the nation's wetland mitigation bankers proved to be extremely useful. Wetland banking is a relatively new industry; one that could possibly expand and

continue to develop over time. It is hoped that these research results may facilitate communication between bankers, agencies, environmental groups, academics, and the general public so that together we may better protect and preserve our nation's precious natural resources.

Appendices

Appendix A

Pre-notification letter

May 10, 2005

John Doe
Any State DOT
1234 Anystreet Blvd.
Anywhere, AL 36211

Re: Your Wetland Bank

Dear John Doe:

As someone with experience with wetland banking, you have been selected to participate in a national study of wetland banking programs. This research is part of a project at Michigan State University focusing on wetland mitigation banks.

In a few days, you will receive a telephone call from a researcher at Michigan State University. All we ask is that you help us by answering a few questions about your experience with wetland banking. We understand that you are busy and will be glad to schedule a phone interview with you at a time of your convenience. We are writing to you now since many people like to receive advance notice of these phone calls.

You have been carefully selected to be part of a scientific sample. The results of the study will provide important input to policymakers from the people who have been actually involved in wetland banking programs. Your participation is voluntary and we will keep your responses confidential to the maximum extent allowed by law. The conversation should take no more than 30 minutes. You don't have to answer any question you don't like and can refuse to answer at any time without repercussion.

If you have questions about the project, please contact me at the numbers below. If you have questions or concerns about your rights as a study participant, please contact Ashir Kumar, MD, Michigan State University's Chair of the University Committee on Research Involving Human Subjects. You may contact Dr. Kumar, anonymously if you wish, at (517) 355-2180, by e-mail at UCRIHS@msu.edu, or by regular mail at 202 Olds Hall, East Lansing, MI 48824.

Thank you very much. It's only with your help that we can learn about how wetland banks work. Thanks for helping us with this important and timely research.

Sincerely yours,

Michael D. Kaplowitz
Associate Professor
T: 517/355-0101
F: 517/353-8994
E: kaplowit@msu.edu

Appendix B

Informed Consent

Informed Consent

Hello. My name is Deb Bailey and I'm calling from Michigan State University. I would like to speak with _____

I'm working on a national study of wetland mitigation banks for Michigan State University. Did you receive the letter we sent to you last week describing the project?

☐ Yes (1)
☐ No (2)
☐ DNK (8)
☐ Other (3)

[As the letter points out,] Researchers at Michigan State University are trying to learn from individuals about their experience with wetland banks and banking programs across the country. We are interested in learning about your perspective on how wetland banking works.

If you have questions about the study, please contact Dr. Michael Kaplowitz at (517) 355-0101. If you have questions or concerns about your rights as a study participant, please contact Ashir Kumar, MD, Michigan State University's Chair of the University committee on Research involving Human Subjects. You may contact Dr. Kumar, anonymously if you wish, at (517) 355-2180, by e-mail at UCRIHS@msu.edu, or by regular mail, 202 Olds Hall, East Lansing, MI 48824.

If it is Ok, I'd like to begin by sharing with you some information about this telephone interview. OK?
☐ Yes (1) CONTINUE
☐ No (2) THANK AND TERMINATE

Your help is important for helping us learn about wetland banking. There is no right or wrong answer. What you say will be completely confidential. Your participation is completely voluntary.

Our conversation should take about a half-hour or so. You don't have to answer any question you don't like and can refuse to answer at any time without repercussion.

While we may use information from our conversation in research reports and publications, your privacy will be protected to the maximum extent allowable by law.

If, at any point during our conversation, you need to go, just let me know and we can make arrangements for me to call you back

So may I ask you some questions about your experience with wetland banking?

☐ Yes (1) CONTINUE

□ No (2) THANK AND TERMINATE

Since I don't want to miss anything we talk about, would it be alright if I tape-recorded our conversation? This will help me since it is hard for me to listen and write at the same time? *[If respondent hesitates, remind them of confidentiality of interview and that the interview will go faster without need to hand write notes.]*

□ Yes (1) CONTINUE AND RECORD
□ No (2) CONTINUE AND TAKE WRITTEN NOTES

If a person has questions about the purpose of the call you may give them the following additional information:

We're looking for people who have had some experience being involved in a wetland mitigation bank. You don't need to be a wetland expert or business owner. We simply would like to learn about what you know and do regarding wetland banks. OK?

Appendix C

Discussion Guide

Interview Record Form

Interview ID_____Interviewer_____ Date_____ Time_____

Respondent Name_____ Phone_____

Address_____Gender: □ Male (1)

_____ □ Female (2)

City_____ Zip_____

E-mail Address_____Possible Response Code_____

Discussion Guide

1. Ok first tell me a little bit about yourself and what you do regarding the wetland banking program.

2. Describe your wetland bank. Where is it? What is it like? How large is it? What type of wetland its it? Do you have any others planned? Have any failed?

3. What was the original purpose of your wetland bank, current purpose? What stage is it in?

4. What was the original land use of the bank site? Describe the general on the ground work (construction, planting) you did to create wetlands in your bank?

5. Who determines how many credits are available for each bank? (individual banker, agency?) How is this number of available credits calculated? How much do credits cost in your bank? Who sets this price? Describe the process for releasing credits for sale? Who determined this process? What increments can you sell credits? Who will have the land and/or easement after all credits are sold? Is there any money set aside for future maintenance of the bank, how much goes to whom? What happens if bank fails?

6. Who manages and operates your bank in its formation; credit selling period; and after credits are sold? What kind of background and training do they have? How long have they been with the bank? How many people work on the various aspects of the bank?

7. What permits did you need to form your wetland bank? Describe the process involved for getting these permits? How long did the whole process take from start to finish? What was the total cost of putting this bank together? What agencies did you work with? How supportive are the agencies?

8. What is the monitoring schedule and who determines this schedule? What is the success criteria and who determines this criteria? What is the service area and who determines this service area?

9. Who is the largest/smallest client? How are you getting your clients? Are your clients public, private, how many of each? What are some reasons your clients use your bank? How far away is mitigation bank from impacted area?

10. Are they other wetland banks in your area? Tell me about them? How does your program compare?

11. What are the keys for successful wetland banking?

12. What are the key obstacles to wetland banking?

13. If you could change on thing about wetland banking what would that be?

14. Are there other things about your wetland banking program that you'd like us to know?

15. Do you have any advice for us as we contact other programs to learn about wetland banking?

Thank and Terminate

Thank you very much for your time and help. I know that you are busy and appreciate your help. In the even that we have a few follow-up questions, we would like to be able to contact you again. We can do so by telephone or e-mail. Is that OK?

☐ Yes (1) CONTINUE
☐ No (2) THANK AND TERMINATE

We do not have an e-mail address for you. What is your e-mail address?_____

OR

Let me confirm that your email address is _____

Thanks again, if you think of something else about your wetland banking program that you'd like to share with us or you have questions or concerns, please feel free to call me at 517-353-1919 or Dr. Michael Kaplowitz at 517 355-0101. I can also give you an email address if you'd like. (kaplowit@msu.edu)

Thank you

Debriefing Section

What were the key points made?

Appendix D

Various Forms of Discussion Guide

6/2003 13 Interviews

1. Ok [insert name], tell me a little bit about yourself and what you do [regarding the wetland banking program.]

2. The words wetland bank and wetland banking program can mean a number of things. Can you tell me what these words mean in your experience? Describe your wetland bank. Where is it? What is it like? How large is it?

3. What would you say is the purpose of your wetland bank? Who started it and why? How is it going?

4. How does your bank work? Tell me how wetlands are created in your bank? What types(s) are they?

5. How do wetland credits work? Tell me how wetland credits are calculated? How are wetland credits used?

6. Who manages and operates your bank? What kind of background and training do they have? How long have they been with the bank?

7. How does your bank interact with regulatory agencies? Federal State, Local?

8. Who uses your wetland bank? What are some reasons your clients use your bank?

9. Are they other wetland banks in your area? Tell me about them? How does your program compare?

10. What are the keys for successful wetland banking?

11. What are the key obstacles to wetland banking?

12. If you could change on thing about wetland banking what would that be?

13. Are there other things about your wetland banking program that you'd like us to know?

14. .Do you have any advice for us as we contact other programs to learn about wetland banking?

6//2003 -10 Interviews

1. Ok [insert name], tell me a little bit about yourself and what you do [regarding the wetland banking program.]

2. The words wetland bank and wetland banking program can mean a number of things. Describe your wetland bank. Where is it? What is it like? How large is it?

3. What would you say is the purpose of your wetland bank? Who started it and why? How is it going?

4. How does your bank work? Describe the general process you went through to create wetlands in your bank? What types(s) are they? (how many personal work it, generally what is planted and what type of bank is it, generally)

5. How do wetland credits work? Who determines how many credits are available for each bank? Tell me how wetland credits are calculated by this entity (individual, agency. ECt.)? How much do credits cost in your bank? Who sets this price? How are wetland credits used? Describe the process for releasing credits for sale?

6. Who manages and operates your bank? What kind of background and training do they have? How long have they been with the bank?

7. What permits do you need to form your wetland bank? Describe the process involved for getting these permits?

8. Who uses your wetland bank? How many clients do you have? Who is the largest/smallest client? Are your clients public, private, how many of each? What are some reasons your clients use your bank?

9. Are they other wetland banks in your area? Tell me about them? How does your program compare?

10. What are the keys for successful wetland banking?

11. What are the key obstacles to wetland banking?

12. If you could change on thing about wetland banking what would that be?

13. Are there other things about your wetland banking program that you'd like us to know?

14. . Do you have any advice for us as we contact other programs to learn about wetland banking?

6/23/03 – 7 Interviews

1. Ok [insert name], tell me a little bit about yourself and what you do [regarding the wetland banking program.]

2. The words wetland bank and wetland banking program can mean a number of things. What does the words wetland bank and wetland banking program mean to your vs. the general public? Describe your wetland bank. Where is it? What is it like? How large is it?

3. Who started it and why? What would you say is the original purpose of your wetland bank, current purpose? How is it going?

4. How does your bank work? Describe the general process you went through to create wetlands in your bank? What types(s) are they? (how many personal work it, generally what is planted and what type of bank is it, generally)

5. How do wetland credits work? Who determines how many credits are available for each bank? Tell me how wetland credits are calculated by this entity (individual, agency. ECT.)? How much do credits cost in your bank? Who sets this price? How are wetland credits used? Describe the process for releasing credits for sale?

6. Who manages and operates your bank in its formation, credit selling period, and after credits are sold? What kind of background and training do they have? How long have they been with the bank?

7. What permits do you need to form your wetland bank? Describe the process involved for getting these permits? Included monitoring schedule, success criteria.

8. Who uses your wetland bank? How many clients do you have? Who is the largest/smallest client? Are your clients public, private, how many of each? What are some reasons your clients use your bank?

9. Are they other wetland banks in your area? Tell me about them? How does your program compare?

10. What are the keys for successful wetland banking?

11. What are the key obstacles to wetland banking?

12. If you could change on thing about wetland banking what would that be?

13. Are there other things about your wetland banking program that you'd like us to know?

14. . Do you have any advice for us as we contact other programs to learn about wetland banking?

50 Interviews

1. Ok [insert name], tell me a little bit about yourself and what you do [regarding the wetland banking program.]

2. The words wetland bank and wetland banking program can mean a number of things. Can you tell me what these words mean in your experience? Describe your wetland bank. Where is it? What is it like? How large is it? Do you have any others planned? Have any failed?

3. Who started it and why? What would you say is the original purpose of your wetland bank, current purpose? How is it going?

4. How does your bank work? Describe the general process you went through to create wetlands in your bank? What types(s) are they? (how many personal work it, generally what is planted and what type of bank is it, generally) What was the original land use of the site?

5. How do wetland credits work? Who determines how many credits are available for each bank? Tell me how wetland credits are calculated by this entity (individual, agency. ECT.)? How much do credits cost in your bank? Who sets this price? How are wetland credits used? Describe the process for releasing credits for sale? What increments can you sell credits? Is there any money set aside for future maintenance of the bank, how much , goes to whom?

6. Who manages and operates your bank in its formation, credit selling period, and after credits are sold? What kind of background and training do they have? How long have they been with the bank?

7. What permits do you need to form your wetland bank? Describe the process involved for getting these permits? Included monitoring schedule, success criteria, service area? How supportive are the agencies? What agencies did you work with?.

8. Who uses your wetland bank? How many clients do you have? Who is the largest/smallest client? How are you getting your clients> Are your clients public, private, how many of each? What are some reasons your clients use your bank? What is the geographic area for credit market? How far away is mitigation bank from impacted area?

9. Are they other wetland banks in your area? Tell me about them? How does your program compare?

10. What are the keys for successful wetland banking?

11. What are the key obstacles to wetland banking?

12. If you could change on thing about wetland banking what would that be?

13. Are there other things about your wetland banking program that you'd like us to know?

14. Do you have any advice for us as we contact other programs to learn about wetland banking?

60 Interviews

16. Ok first tell me a little bit about yourself and what you do regarding the wetland banking program.

17. Describe your wetland bank. Where is it? What is it like? How large is it? What type of wetland its it? Do you have any others planned? Have any failed?

18. What was the original purpose of your wetland bank, current purpose? What stage is it in?

19. What was the original land use of the bank site? Describe the general on the ground work (construction, planting) you did to create wetlands in your bank?

20. Who determines how many credits are available for each bank? (individual banker, agency?) How is this number of available credits calculated? How much do credits cost in your bank? Who sets this price? Describe the process for releasing credits for sale? Who determined this process? What increments can you sell credits? Who will have the land and/or easement after all credits are sold? Is there any money set aside for future maintenance of the bank, how much goes to whom? What happens if bank fails?

21. Who manages and operates your bank in its formation; credit selling period; and after credits are sold? What kind of background and training do they have? How long have they been with the bank? How many people work on the various aspects of the bank?

22. What permits did you need to form your wetland bank? Describe the process involved for getting these permits? How long did the whole process take from start to finish? What was the total cost of putting this bank together? What agencies did you work with? How supportive are the agencies?

23. What is the monitoring schedule and who determines this schedule? What is the success criteria and who determines this criteria? What is the service area and who determines this service area?

24. Who is the largest/smallest client? How are you getting your clients? Are your clients public, private, how many of each? What are some reasons your clients use your bank? How far away is mitigation bank from impacted area?

25. Are they other wetland banks in your area? Tell me about them? How does your program compare?

26. What are the keys for successful wetland banking?

27. What are the key obstacles to wetland banking?

28. If you could change on thing about wetland banking what would that be?

29. Are there other things about your wetland banking program that you'd like us to know?

30. Do you have any advice for us as we contact other programs to learn about wetland banking?

Appendix E

Thematic Codes from Analysis

Advice

Agencies worked with #

Agency documents

Anything else about your program

Change one thing about wetland banking # *

Clients coming from # *

Comparing banks # *

Cost involved in creation# *

Credit amount # *

Credit increments

Credit price # *

Credit release schedule # *

Credit type# *

Current status of bank # *

Distance from impacted sites

Endangered species credits

Failed banks

Future funding of bank # *

Future of wetland bank land # *

History of land use # *

History of manager in wetland banking # *

How long the bank has been around

Impact ratio

Interaction with agencies # *

Location of wetland

Location/service area # *

Obstacles to wetland banking # *

Others working with bank

Permit type

Process of creation # *

Profession of bank manager # *

Proposed banks # *

Public opinion of wetland banks

Purpose of wetland # *

Reasons for using the banks # *

Size of wetland # *

Something other than banking

State law

Success criteria # *

Success for wetland banking # *

Time table for permit # *

Type of wetland # *

Users of credits # *

What does wetland banking mean

Codes examined in depth in this study

* Codes examined also using quantitative analysis

Appendix F

Representative Quotes

Representative Quotes

Section 1 - Type of Wetland

"Varied"

- "Well we have 7 major wetland community types, ranging from submergent-emergent marshes all the way up to hydro-pine flat wood and riparian forest" (0554).
- It's a combination of swamp, hardwoods, coastal plain hardwoods and wet flat hardwoods" (18249).
- It's actually got all phases. Its got everything from wet prairie all the way down to submergent plants. So its got the whole thing" (20267).

"Bottomland Hardwood"

- "The banks that I was developing were bottom wood hardwood mitigation banks because there was a lot of impact to bottom wood hardwoods" (12153).

Section 2 – Number of Proposed Banks

"Zero"

- "No I wouldn't do it again. Its too much a headache, to get through all the regulatory and everything else, it's a real pain" (20268).
- "Not at this time, there are getting to be quite a few other people getting into the business" (29330).

"One"

- "We have one, yes the permit application has been submitted" (0558).
- "We've got an expansion of it planned" (16230).

"Two"

- "We got two more that are in the approval process that are also commercial banks" (0681).
- "In fact I do, I have two other long leaf pine savannah banks purposed of which I am a partner in" (12155).

"Three"

- "I would say we have three right now" (23282).
- "I have three in the works now" (0315).

Section 3 - Quotes-Purpose of Wetland

"Environmental"

- "Slow impacts, or to help with wetland mitigation" (26306).
- "To try to find a way to address, you know the environmental needs that were out there" (0320).
- "Traditional mitigation was not working; we needed to find something that would" (0554).

- "To restore vernal pool habitat" (039).
- "We would like to rehabilitate and to be perfectly honest, we will continue to rehabilitate them whether we get wetland bank credit or not" (07101).

"Demand"

- "To provide wetland mitigation credits in the drainage area" (31351).
- "It was incentive for economic development" (20267).
- "To serve the sort of commercial need for mitigation down here" (17236).
- "There was no bank within the basin to turn to to mitigate the impact that he had and it was a very costly and cumbersome task to do mitigation prior to the bank" (17234).
- "To utilize to offset mitigation needs that land owners and real-estate developers were having as they developed their properties" (22281).

"Profit"

- "Mitigation banking can be a pretty good source of income for farmland" (0684).
- "We knew we were creating wetlands as a result of some of our projects and we wanted to take credit for those" (20265).
- "There was a desire on the family's part of course to generate income" (0552).
- "I think that the people that put together the plan had economic incentives because it is a private enterprise you know we are not subsidized by anyone" (0545).

"Specific Projects"

- "They're both closed, they were for our internal purpose" (12138).
- "We needed up front mitigation and we wanted to try and minimized project schedule delays" (26305).
- "Compensation for wetland loss caused by DOT facilitated projects" (33376).
- "The original purpose of course was to create wetlands that could be used to offset potential future impacts due to transportation projects" (31340).

"Extra for sale"

- "One would enhance the existing wetland by making a bank and making a bigger wetland and turning that wetland into a bank so it would be a total loss on my ground that I didn't want to develop" (20268).
- "To create wetlands, establish additional wetland, and then we would obtain credit which we could sell on the open market" (21275).

Section 4 - Current status of wetland bank

"Monitoring"

- "The restoration was completed at the end of 1997, and it is in the phase as is generally known as trending toward success. We believe, subject to completing the appropriate documentation, that we can get what's called a determination of success" (0567).
- "Normally its like three people that maintain the site year around, it is still under monitoring requirements right now, as soon as it gets off monitoring requirements obviously, the amount of maintenance that is required out there will slow down" (0547).

"Concept"

- "It's still a concept. We haven't bought any land yet. We have a design that is almost complete but really the project is on hold awaiting project needs" (07103).
- "We're in the process of getting the bank set up, its been a long process so we don't have the bank set up as of yet, but we do have the wetlands established" (0440).

"Construction"

- It's just finished construction. It probably has got another three years of monitoring so we need probably 3 to five years of monitoring. It is in is first year of growth" (20265).
- "We're just now completing up the final phase of construction,. I mean it was multiple little contracts" (22279).

"Complete/Sold Out"

- "We have some that we're through with our five years of monitoring and are up and running and well-established and we've used or virtually used all of the credits out of them so there just out there and we still own them and we'll maintain them" (026).
- "It's sold out, there were some restrictions on it and we can't sell any more credits" (0555).

Section 5 - Process of Creation

"Enhanced"

- "The truth of the matter is that it was always a wetland, portions of it were relatively intact....we had to do some physical feature removal, removing roads, dikes, levees, things that impede the natural follow of water, then we did exotic eradication and habitat enhancement" (0567).
- "The construction we did was excavation, lowering the ground elevations in two or three different cells to provide inundation areas, there's a natural spring that feeds the area" (20265).

"Restored"

- "We filled in some ditches that had been dug on the property to drain it, we put in ditch blocks that would in effect restore the retention of the water on the property" (0552).
- "Basically all we did is there were wetlands that were considered PC, or prior converted wetlands, so they were wetlands before.. They were put into agriculture and usually on marginal land, land that honestly should have never been cleared, so basically all we did was go back n and plant the trees as dictated by the Army Corps of Engineers" (12143).

"Didn't Know"

- "I don't know all the ins and outs, but I know we had engineers specifically selected for their experience" (29332).
- "Now that I can't, I'm the finance and paperwork guy, I can not even begin to tell you what they had to do" (17234).

"Created"

- "They go out and form our proposed plans we create vernal pools by using heavy equipment and contouring the land to pond in certain areas and runoff in other areas" (039).
- "There was some soil testing to make sure we weren't stirring up anything and they basically had to build in the piping system and install the pumps right at the intake area and massage the earth to create those four ponds which are all at varying depths" (0442).

"Preservation"

- "Oh it was a wetland, we didn't have to do anything to the land itself to make it a wetland it was just considered a wetland" (12177).

Section 6 - Original Land Use

"Farmed"

- "It had been used just a little bit for some farming, some watermelons had been raised on some of it" (0552).
- "Just the other interesting note to this is its privately owned land, it is land that we farmed for several years as a citrus operation" (0553).
- "It was farmland. It was prior converted wetland" (10133).

"Timber"

- "The only use of those two was timber. I think at one of the sites, somebody had done some digging to see if it was worthwhile to do some sand and gravel mining but it was two test holes, nothing major" (17242).
- "Uh some of it had been pastured, some of it had been farmed, timbered, most of it I'd say the majority was in um timber, and it had some pasture land where they'd run cows and some farming not a whole lot of farming. And we restored all those opened areas,

where they you know had cattle and gone in and mowed and kept it mowed we restored a lot of those areas" (29330).

- "It was a forest, it got cut by a timber company and it was getting ready to be put back into pine" (31341).

"Abandoned/idle"

- "It was abandoned the property" (29334).
- "Most of it was just idle where they would hunt" (12177).
- "It was just vacant land. It was undeveloped wetlands, but degraded" (21269).

"Gazing Land"

- "I selected some areas that were pastures" (12153).
- "Probably in the late 50s the farmer had installed ditches every hundred feet across the entire property and effectively drained it and put it into grass and it functioned as a pasture for several decades before we acquired it" (0566).

"Gravel/Sand/ Clay Pit"

- "Perhaps a 100 years ago it was striped mined for clay used for the manufacture of bricks. They essentially mined it and left ponds, you know 8 to 10 feet deep and swamps" (0686).
- "sometime in the early 60's about 40 years ago a company came a long and got a permit to mine sand and gravel from this property" (0441).

"Don't Know"

- "I don't know. It's that old that I don't know" (31340).
- "I'm not sure what it was" (0563).

"Other"

- "That was a former dredge disposal site" (21270).
- "The site was acquired.....to be used for a nuclear power park" (0567).

Section 7 - Who Determines Credit

"Agencies"

- "The Corps of Engineers and the MBNRT determines that, the five agencies" (11135).
- "The Corps, I really don't know what they did, it depends on how wet it is considered" (12176).
- "The Minnesota Department of Natural Resources.... I think it is largely a sole agency decision. They do have to consult with the local soil and county soil and water conservation district, however, it is largely the DNR decision" (15220).

"Negotiated"

- "We had an engineer do all that for us and that was a negotiated situation again. I'd say one thing that one problem we had was the fact that we were basically one of the first ones to establish, so

naturally a lot of the criteria had to be established so to speak" (0687).

- "We sit down with the resource agency and negotiate it" (27316).

Section 8 - How are wetlands calculated by this entity?

"Acre"

- "Um, in all, let's see, I'm not so clear on that one. I have to think about that one a little more but the pine sites, it's essentially acre for acre. Um, there is a process in place to look at sort of ecological values, but, because of the subjective nature of those calculations, it was determined that it would be just a straight acre for acre replacement in most cases" (12160).
- "For wetland mitigation credits, it is just a matter of developing the acres....In this case, you have to satisfy the criteria that you develop for a functioning wetland system and it is just sold by acre" (12153).

"Functions"

- "Now we've got into the HCM thing where we're really in a new stage now where we measure the functions and value of the wetland, we may not do 2;1 we may do it differently" (0316).
- "They use Charleston methods, what that does, it just has four or five different categories and you are given so many po8ints as to what you do in each of those categories and then they total that us and multiply it by the number of acres that you have in each category" (17234).

"Acre/type"

- "They would look at the type of impact and then determine the ratio. What we do is we look at the type of mitigation to determine the ratio. So if you are proposing to do a creation of wetlands from upland, it's a one and a half to one ratio – IMPACT to mitigation. So if you impact an acre, you do an acre and a half of creation. If you impact an acre and you CHOOSE to do ENHANCEMENT, it's 3 to 1. So you do 3 times as much ENHANCEMENT of EXISTING wetlands by planting and sometimes, you know, diverting water sources into a wetland area or what have you. Whatever would be... whatever is DEGRADED in that wetland that you can improve, may lead to an enhancement situation and that would mean you'd do 3 acres for that one acre you're proposing to impact. And if you were doing restoration, which is the most...the ONE we'd like...the approach we'd like to see done more often, we have a 1 to 1 ratio and that's because we're talking about, in restoration, taking an area that's been drained or filled that WAS wetland in the past and either reversing the activities that drained it. In other words filling ditches, breaking drain tiles, removing fill and in those circumstances, obviously you have all

the ingredients for a wetland right there and taking away the stressors or the things that have eliminated its function is more certain to produce the wetland that was there in the past" (24296).

- "Well generally we're always thinking about debit, but basically credit is determined by acres restored by type and the reason why we have this is basically the state was more than satisfied to just consider acres as credit but the federal agencies have this need to do replacement of wetland function. None of the methods for determining how a wetland functions was acceptable in establishing credit even though in the Patrick marsh bank I did have a mechanism for computing replacement ratios based on wetland function. Now what we have is replacing, and this was done quiet awhile ago the only agreement we could come to finally and it was compromise on all sides, but was that the if you replace wetland in say the major drainage area within the floristic province and by wetland type you that formed a ceraget for replacing wetland function. Not that it really replaced wetland function but it was the closest thing that anybody would agree to that would serve the purpose of replacing wetland function. It could be argued in a number of cases that no you haven't replaced wetland function but it was the only thing that could really be derived. So we ended up with a table of increasing replacement ratios depending on whether you were in the drainage area or out of the drainage are or in the floristic province or out of the floristic province. So the floor of this is one to one, if you're with the drainage area, floristic are and you're replacing by type the replacement ratio is one to one but depending on what you're dealing with by type you have different increment of increase where lets say if you were replacing a wetland bog, if you were replacement an open bog in the south part of the state you might have a 3 to one replacement ration. Because it's out of drainage area, it's out of floristic province" (33376).
- "If you create or restore an acre of wetlands, you typically get one acre a credit. If you enhance one acre of wetland, you typically get, typically you get .5. It can be anywhere between .25 and .5 credits" (0320).

Section 9 - Credit Release Schedule

"Varied"

- "In the process of permitting the bank, you come up with a credit stone, there will still be some negotiation that can take place on the release schedule. The percentages to be released is pretty well set, but I think that there is some room for negotiation in determining what milestones at the sites will qualify us for release of a certain percentage of credit" (17236).

- "Well when I went through it they called it the standard release, credit release schedule, so I 'm sure on a case by case basis it could be changed" (0684).
- "Its completely different for every bank. I mean typically the release schedules are fairly small and then it gets larger as the bank meets success" (21274).

"Zero"

- "That works on a case by case basis but our situation, we didn't get any pre-sale and after out second [year of] monitoring we got 30%" (10133).
- "Now our statute says that we have to...we can't allow any credits to be released until we see the work has been done and there's a high chance of achieving wetland hydrology" (24296).

"5 percent – 25 percent"

- "We got 15% when we signed the paperwork" (01321).
- "Actually they allowed me, because I was doing so much work with them, to sell about 25% of the projected credits before I even began to plant the trees" (12153).

"30 percent - 50 percent"

- "We're allowed 30% of presale of credits before we do the first part of the work" (09107).
- "They gave me 50% of that as immediate sale to fund the bank" (11136).

"51 percent – 99 percent"

- "So I got a majority, you know, probably close to 60-70 percent of my credits released within the first year" (06348).
- "Yeah they're giving anywhere for 90, I've heard 90%-50% of your credits up front" (29330).

"100 percent"

- "We got all ours at once" (29332).
- "In our bank essentially the credits were available upon the approval of the prospectus" (17239).

Section 10 - Future Funding

"Yes"

- "Whoever the long term mangers gonna be, we turn that land over to them along with the long term trust fund" (0545).
- "We have established this trust fund and the fund amount was established with the intention of being able to supply the management cost, uh funds needed to maintain this bank in perpetuity" (0563).

"No"

- "We're not intending to give them any money. These are agencies that are established and have funds to that that" (21275).

- "No, but the banking, conservation easements allow hunting and there's some rent that could come from it" (31351).

Section 11 - Future of Wetland Bank Land

"Still Own"

- "We'll continue to maintain that as a wetland it's district and public property" (20265).
- "We actually still own all of our sites and we manage all of our sites" (0320).

"Turn over Non Profit"

- "The land goes to a non profit entity for long term stewardship" (17236).
- "The land itself gets dedicated into either a long term conservation easement granted to a non profit entity" (037).

"Turn over Agency"

- "We are turning them over to either the Fish and Wildlife Service or the Game and Fish Commission for management" (024).
- "What we did is we donated the land to the state of California ahead of time so they own it they have title to it" (0317).

"Sell"

- "It's part of a 4000 acre farm and the whole farm was sold" (0689).
- "I'll probably sell it off for some recreational track for hunting" (28319).

Section 12 – Agencies

"US Fish and Wildlife"

- "The permit had to come from the corps of engineers, but if the US fish and wildlife service wasn't happy, they would object, they would file a letter of objection to my application" (12153).
- "Some of the other agencies that haven't really taken an interest in mitigation, particularly some of the resource agencies like Fish and Wildlife or NOA Fisheries that haven't really developed their own policy have been very reluctant to engage the process, and it has been very difficult to try to gain their involvement. They are not totally committed to the idea that mitigation banking does really offer better resource replacement than traditional mitigation and in a lot of cased they would rather see no impact at all and they think that any alternative is unacceptable" (21270).
- "The team is pretty much driven by the US Fish and Wildlife. It was whatever they said, whatever their feelings were, everybody else bowed down and said ok, ok. The Corps technically had the final say but in essence if we didn't agree with the US Fish and Wildlife had to say the Corps said well we don't agree with you" (11136).

- "The Fish and Wildlife has been a little bit cantankerous to deal with" (06348).

"Corps"

- "Everything that they would want [Corps] he would get it for them and yet we still had problems. Finally I went over his head" (12185).

"EPA"

- "We had to work with the EPA, did I mention that. The EPA was the thorn in our side, they were the ones that were actively trying to prevent this whole think from happening" (16230).
- D: They were all very supportive? R: No, No, In fact EPA, I've only seen...I saw them one time in 1998 and that's been it" (01321).
- "Corps of Engineers was very supportive. Fish and Wildlife were supportive. EPA never showed up here and they were supportive by their signature, but they were usually the last one to sign" (22281).
- "The federal agencies we've dealt with, EPA has been virtually non-existent in the process. I've heard that they have a very limited traveling budget, so when we meet down here and look at the site or have meetings, they don't come. They sign off on all these things but I've never met anybody from the EPA" (31344).

"State/Local Agencies"

- "All of the agencies were supportive except for the [state] DNR Division of Wildlife" (23283).
- "The County agency was hostile. D: Why was that? R: Because they county is naturally almost by itself 100percent wetlands. They don't need any more created, and they expressed that attitude many times. They saw this project as taking productive farmland and making it back into swamp, we already got plenty of swamp, we don't need any more" (15220).
- "It was somewhat adversarial the first effort. I think the Service came kicking and screaming. They DIDN'T want to do it, they DIDN'T like to see banks. [The state] Fish and Wildlife Service. And I think that they did it grudgingly because they saw that it was something...the train was leaving the station without them in other words. So they jumped on just so that they wouldn't be left in the dark" (31357).
- "Most of them were supportive, EPD was obstructive. They were just refusing to agree with what everybody else thought we should do" (0686).
- "Well the problem that we had is we got state, we got the approval from the corps of engineers and they authorized our bank, however DEQ and EPA, DEQ the department of environmental quality in the state, did not join in as part of the management team and

therefore we had complications of trying to get the credits approved for about another year until we got the DEQ and EPA on" (17234).

Section 13 – How monitoring time was determined

"Negotiated"

- "They're negotiated up front" (0327).
- "Basically it was a negotiated process" (0687).

"MBRT or Corps"

- "The agencies have decided that they want a minimum of five years of monitoring" (037).
- "That [monitoring time] all came out of the MBRT process" (0566).

"State"

- "That's part of the Wetland Conservation Act, a state law that requires a 5 year monitoring period and the Corps went along with that" (15222).
- "I think it was the requirements of the State Wetland Conservation Act" (15220).

"Met Criteria"

- "Until you've met all your thresholds" (09108).
- "[five years?] yes, or until the success criteria is met" (18251).

"Didn't know"

- "That's probably a question for the coastal conservancy, I don't know that off hand" (0327).
- "I think they come once a year, but you might want to check with the Corps of Engineers" (29332).

Section 14 – Service area

"Flood plain/Drainage basin/Watershed"

- "We service we have a service area and that service area is designated, defined by two things, one is that people have to be within 20 mile radius of the bank itself and the second is that it has to be in the watershed of the bank itself" (0317).
- "Our service areas here are determined by well loosely determined by watersheds" (0554).

"Hydrologic Unit Codes"

- "Its done by hydrologic codes so that the areas that are being impacted have the same type of environment that you have in your bank and those are determined in the hydrologic codes" (17234).
- "In Virginia, the code of Virginia states that you are only allowed to mitigate within the HUC that you are in or an adjacent HUC, so you can't just go anywhere in the state" (31340).

"Eco-region"

- "For the ones that we've been doing, you have to be, whoever is using them has to be on Santa Rosa Plain which is a fairly contained area, it's a flat area between two mountain ranges. The Santa Rosa plain is considered a special region" (0326).
- "It was almost the entire delta eco-region of AR" (024).

"County"

- "In most parts of the country service area is determined by watershed. But in Florida, since land elevations here are fairly level, service areas are often determined by political boundaries" (0563).
- "Seven Counties originally in the greater [metropolitan] area and it's been expanded a little bit in response to the adverse court ruling and work that we've continued with the Corps of Engineers and they've given us another county and a half or so" (29332).

"State"

- "We have an agreement with the banking review team to over time, disperse the banks throughout the state, but we do withdraw credits from the whole state on a bank with the idea that we can't simultaneously or immediately have banks established in all of the biotic regions" (19263).

"Other"

- "We can sell credits to any impacts that are within the urban gulf boundary" (24298).

Section 15 - How the Service Area was Determined

"Agency"

- "I don't really know how far our service area will or won't go. Cause the Corps of Engineers will decide, you know, if they can or can't do that..... The Corps of Engineers will decide yeah" (20267).
- "They established that early on in their process of forming the mitigation bank review team they determined what the service areas was before we applied a s banker" (07102).

"Negotiated"

- "It's another one of those things that is determined in the MBRT process. The Mitigation bank review team. And again it was one of those things that, you know obviously the owner of the mitigation bank wants one that covers all of North America and the agents want it to be small. Again it was a negotiation process" (0553).
- "We negotiated that to some extent and it's basically the existing watershed" (10134).

Section 16 - How the Success criteria was determined

"Agency"

- "...the guideline gives a guideline for what it would be or close to would be" (0545).
- "That's all in the permit,....its pretty standard" (31339).
- "That was all established by the public hearing process and through the MBRT" (10133).

"Negotiated"

- "The army corps played a hand in it but we proposed the criteria and they said yay or nay and then we modified it or negotiated it on what it ultimately would be" (09110).
- "We proposed it [success criteria] and they approved it, and we had to talk about that a little bit" (26311).
- "The success criteria is negotiated with each bank although it's been fairly similar for each bank" (23282).

Section 17 – Agency Support

"Very Supportive"

- "I'd say very supportive. They've been encouraging us for a number of years to get into the banking business. They have a firm grasp of that there's a real ecological benefit into mitigating s a small impact at a large site. The success is so much better, it's so much more an efficient use of tax payers dollars so they've been very supportive" (07103).
- "I would say very [supportive] our experience with the agencies was excellent. They, when I say they, I say the individual from the Corps was very practical and very helpful" (15222).

"Not very supportive"

- "Well, they were very reluctant. We had a lot of pressure from environmentalists. We had two public hearings actually through the process. The first public hearing came with a lot of demands and assurances. All it really did was drive up the cost of credits. We have to guarantee success of course, we have to put financial assurances, but we actually had to increase all those monetary values so what it did was push the cost of the credits up because we always had to guarantee success of the credit creation. That was a restoration project but by creating the credits the environmentalists push the costs up so any potential developer and basically our biggest clients, Indiana Dept. of Transportation, and so it just pushes up the costs to the taxpayers. We really went round and round on that but we just finally gave them everything they wanted and of course then they have to sign the agreement but it makes it very hard for other bankers to get started in Indiana because of the precedent and the procedures we set forth" (10133).

- "It was push and pull, nip and tuck. Not everybody knew which way to go or what to do because we were the first to do it and I think that lengthened the process. I think it's more streamlined these days because they're several others doing it now. But, we had to go through the process of invention and it was a lengthy process with a lot of legal mumbo jumbo and paperwork" (29332).

Section 18 - Type of banking clients

"Mostly Private"

- "If you just look at the number of clients, probably 90% are private" (0553).
- "Mostly private developers, there have been a couple of instances where there have been some public agencies,,,,,oh 95 percent private it not more" (12160).

"Mostly Public"

- "These are proprietary banks, so they are for DOT projects only" (26302).
- "Different developers uh counties, municipalities, airports, things of this nature, I'd say public would probably be 85 percent [of the clients]" (0687).

"50/50 Split"

- "Well we don't do much, well I'd say its about 50/50" (17234).
- "I would say we're probably, if you look at clients, obviously we've only had a couple of public entities, in numbers most of them are private, but in dollar value, I'd say its probably 50/50" (0558).

Section 19 - How do Bank Managers get their Clients

"Agency"

- "The Corps of Engineers just, passes along our bank along with any other banks in those areas as being suitable providers of mitigation and then the applicants contact us directly to see if we have acreage and to negotiate a price" (12160).
- "Well the Corps of Engineers does the permitting, so when folks go to the Corps for their permits and have to go to a mitigation bank, they get a l8ist of operating banks in that area" (0684).

"Marketing"

- "We market to the business community, to the public sector, we are involved in trade functions, trade shows, we're part of BIA, we're part of public interest groups that get together and talk about restoration, we actively monitor all development that's going on, we monitor trends and growth patterns and all those kinds of thing" (1220).

- "Well we started advertising that we had credits for sale" (0552).

"Press"

- "Gotten some press from the rest of the homebuilders association" (16227).
- "There has been some newspaper advertisement – in terms of articles not advertisements per se just articles about what was happening on that piece of property" (31350).

"Firm referrals"

- "Frequently through consultants, environmental consultant is usually how they find us" (23282).
- "The consultant that has worked on the permit with the person they know that there's the need for mitigation and they may be the sponsors of a site or they may know of another consultant in another watershed that has, so a lot of it is consultant referral to themselves or to another consultant" (13217).

"Other"

- "The Corps depends on the public to call them and say John Doe, I think that he is violating, you know in violation, more so then the corps is out there actually pursuing violators. You have to have a very diligent, you know aggressive program to stop violators or you really don't have much demand" (17234).

Section 20 - Reasons for using the particular banks

"Regulations"

- "They had a negative environmental impact to a wetland someplace and my wetlands would suffice to offset or mitigate that impact" (12153).
- "Some of the clients in the past that have used the bank…yeah, we've used the bank for both 404 permits mitigation condition requirements for mitigations for corps permits" (0316).

"Quality of wetland"

- "Our project is considered very important habitat zone to have save and enhance" (22279).
- "My having been in this business before I get a [of] agents who want to do business with me because they know our bank is really of high quality" (0439).

"Speed"

- "It also speeds up the process…..Particularly speed, cost and practicality" (31350).
- "Speed, they don't, once they write a check and buy a credit, they don't have to spend five years monitoring it, we do" (28317).

"Convenient"

- "Because they don't want to fiddle with it themselves" (0315).
- "Because they don't own any land….they don't [want] to be owners they don't want to go through all the hassle with the

government agencies, they just want to write a check and be done with it" (29330).

"Only available"

- "It's the only bank in the state of Iowa, primary reason" (07102).
- "There's not too many around the area, the size of ours" (20265).

"Reputation"

- "Because they know we're successful and that we are efficient in what we do. Most, a lot of our clients are return clients because they know that when they call here and they need mitigation they need it done quickly, you know I've had people come up here and sign them, I've Fed Ex.'s them, I've faced them, I've had runners, whatever, I mean whatever, whatever we've needed to do we been able to do from a business standpoint" (12148).
- "I think we have a pretty good reputation, we do what we say, we have been in business here 14 years and agencies know if we say we are going to do something we are going to follow through and make it happens" (31351).

"Cheap"

- "Its cost effective it's enormously expensive to do the engineering the construction the monitoring" (10132).
- "The primary reason is economic....we can provide a service for them at a lower price than what they can do otherwise" (24295).

Section 21 -Bank Comparisons

"Not as good/better ecologically/interaction with agencies"

- "We're the best there are, I mean you can ask the Corps. In our efficiency, you know when the Corps calls here they want to show a bank to the EPA, where do they come, they come here" (12148).
- "There was one that I've seen in the literature that we would not recognize....it doesn't meet anybody's requirements" (24296).

"Similar"

- "To the extent that I know, I think that the habitat types of the 3 banks on the coast are pretty similar and I think really in size I think we're all pretty similar" (17236).
- "Yes they are very similar, minor differences most of the banks in this area are very similar" (31351).
- "I would say that there are other banks that meet the same criteria as ours and are adding valuable habitat to the areas" (039).

"Didn't Know"

- "I really don't know anything about them. I'm not even sure on some of the names of them. You'd probably have more information on that than I would" (12143).
- "I'm trying to think what I would know. I don't know, I haven't even bothered to get that information" (0684).

"None"

- "No. There are no other banks in the watershed where we have banks" (21274).
- "None that I know of we're the only one" (25302).

"Cheaper"

- "The Southwest and Southeast, we have competitors in both cases they realized if they were going to get any business that they needed to be more competitive" (12160).
- "We're more expensive because they are undercutting us" (24298).

"More Expensive"

- "We're probably one of the smaller ones based on the 2 or 3 that I have any knowledge of, like I say we've been the cheapest I think" (26306).
- "Our rates have been less partly due to our success, we've been able to achieve our results at a lower cost" (24295).

"Different type"

- "Its different in the sense that they, what they are going to be left with is herbaceous where a lot of our stuff is forested" (0545).
- "The main difference is that ours will be exclusively for transportation uses by public agencies" (07103).

Section 22 - Keys to Success

"Technical Knowledge"

- "Looking at it strictly from a biological perspective they keys are to have a good understanding of what the system is that you're working in" (12160).
- "You definitely need to know your wetland science" (24298).

"Site Selection"

- "Location, location, location; you need to have an appropriate piece of land that has a potential for restoration" (0549).
- "Location, location, location; that's if you can find the right location for wetland restoration or wetland creation, it will make your life a lot easier" (13218).

"Agency Support"

- "Well in our case its to have a good relationship with the resource agencies" (27316).
- "You have to have a regulatory environment where the Corps, the EPA, the Fish and Wildlife service like banking and so they are not standing in your way as clients come to you" (09108).

"Design"

- "You have to know everything about the site to do a quality design" (21269).
- "One of the major components in wetland mitigation is that you can design a great project, you can design a perfect project" (0320).

"Commitment/Monitoring"

- "For me the most important things and one of the great things in mitigation banking is the attention to the long term stewardship aspect" (0320).
- "Long term commitment and understanding of the wetland" (03148).
- "Total commitment to the bank, if you're not committed forget it" (05109).

"Demand"

- "You have to find the property in the area where development pressures are the heaviest" (0555).
- "....finding a site to restore wetland on that's located in an area where there are significant amount of impacts where a lot of mitigation is needed" (23282).

"Hydrology"

- "Establish the appropriate hydrology. Without the hydrology you're dead" (09110).
- "To find the hydrology or an area that has hydrology that would produce a wetland" (20265).
- "Adequate hydrology, that kind of think makes or breaks it" (10134).

"Money"

- "Bank developers commitment and depth of pockets" (29327).
- "Being able to put the money upfront and get things started on the ground" (19263).

Section 23 - Obstacles to Wetland Banking

"In Lieu Fee Programs"

- "In lieu fee or donation programs where an impactor can just simply write a check to the regulation agencies, government agencies to get its permit" (0549).
- "Some of these people take funds in lieu of, that's a horrible program" (28319).

"Regulations/Requirements"

- "We are at the mercy of the EPA regulations and those things are changed quite regularly" (29332).
- "There's always the potential too of the unknown legislature changing wetlands legislation" (24295).
- "The rules have been constantly changing so people have not kept up with the rules or don't understand them" (15221).

"Money/Cost"

- "Huge upfront cost, you have to find somebody willing to do that" (0326).

- "Cost. I think it would be very difficult for a private individual to take on something like this with the kind of monitoring and work it takes" (07101).

"Public Perception"

- "The biggest obstacle is the West Nile virus and those kinds of things coming out now. People are scared of any standing water let alone 50 acres of it" (07104).
- "There's a lot of misunderstand about what it means. People will call me out of the blue and say, gee, I want to do this work on my site, and does that mean you will send me a check? They think of it like a wetland reserve program....The obstacle I'd say is misunderstanding and not knowing exactly what banking is about" (24296).
- "Public perceptions, I think there is an inaccurate perception that has been portrayed that is logical and kind of wide spread and takes a lot of time to correct and that is that all mitigation banking does is give developers the chance to make the same mistakes on a much larger scale" (32372).

"Landowners"

- "If you want to do wetland restoration on the land and the land owner doesn't want to sell you land well you're done as far as that projects concerned" (33376).
- "A project of similar in size to this one, we have a lot of different landowners involved so we've really got a lot of complex issues that take a considerable about of time to get through where as [if] you're a normal mitigation project you might be buying a small piece of land from one land owner" (07103).

"Right Site"

- "Lack of suitable sites in urban areas, or in areas where mitigation is needed, which are the urban and suburban areas" (13217).
- "Finding suitable land that can generate the ecological lift necessary to create credits" (0552).

"Agency Support"

- "Mitigation credits exist only as a commodity only because of the regulatory framework that has been established and so to the extent of the regulatory agency support mitigation banks and their permitting decision, they live or die on that issue" (26307).
- "Getting the project managers who are writing the permits to actually agree to allow to be used is the largest obstacle" (0566).

"Time"

- "One thing, the key obstacle to us are the time lines involved. There's got to be some sort of a streamlining you can do instead of taking two years" (26305).
- "There are so many ways that this could be streamlined and the work could be accelerated" (07102).

- "Actually a big obstacle is the time frame that it takes to permit a bank" (0563).

"Inexperience of Agency"

- "They're young, they don't know what they're doing and they're giving ridiculous advice and making stupid comments and when they have control of your project, you can't call them ridiculous and stupid or else you won't go anywhere so you have to deal with those kinds of things" (31357).
- "Lack of agency understanding....in ability of the agencies to look at the plan and see the problems with it" (0315).
- "You get a 23 year old biologist in a position that is casting judgment on your project and they can hold it up forever" (18249).

"Agency Agreement"

- "Getting everybody together and getting them to agree on a design and getting them to buy off on it" (16226).
- "The environmental agencies, you can never get them all to agree" (33378).

"Competition"

- "Competition within the service area between banks, the bank's prices stay fairly constant and not one begins to undercut one another, but I think ultimately that will happen" (31350).
- "Competition in the market for the cheapest available credits, the cheapest way to process a permit" (17239).

"Science/Nature"

- "Just the survival count, making sure that the trees didn't fail because that is all dependent on the weather" (12177).
- "Probably variable climate" (024).
- "That, trying to get trees to grow" (12185).

Section 24 - Change One Thing about Wetland Banking

"Standards"

- "I would just say all impacts should have to mitigate under the same standards and since we're so regulated in the banking area I whish all other mitigation would have to same standards" (10133).
- "There is not really a standard. It is highly subjective. It sometimes comes down to personalities" (0563).
- "I guess I would say that mitigation banking the mitigation banks are right now I think held at and an extremely high standard compared to the site specific mitigation areas that are being proposed and approved by just individual applicants. That's to say a mitigation bank is a Rolls Royce of a type of mitigation and they are often accepting Chevrolets for site specific mitigation" (16227).

"Money"

- "That the agencies were better funded and had more man power. They are very under funded and don't have enough manpower. But that's across the board in all agencies and all the stuff that deals with the environment. They need more money and more people" (0317).
- .....Part of that is directly related to lack of funding and there's not enough personal and they don't have time to think about it" (01321).
- "If there could be more funding for the state agencies and for the federal agencies to have more people available to facilitate the banking process" (0687).

"Time"

- "Probably again the time frame. Just make it easier to establish you know they've been slowly coming up with templates and cut and paste kind of stuff but its still very tedious" (037).
- "I would put time constraints on the corps of engineers to respond to permit applications, to respond to letter requests, that sort of stuff" (0553).

"Use More"

- I would like to see mitigation banking as the preferred choice for all offsite mitigation" (0545).
- "I think it would be that same thing. The regulatory agencies recognizing the importance of the banks and encouraging the use of them. That's basically it. I would emphasis that they should encourage banks when the product is at least as good if not superior to the alternative. I do not promote using banks if it doesn't provide the optimum of restoration benefit" (24295).
- "They don't understand that people are suppose to get permits and that its better to consolidate large blocks of wetlands than it is to leave these little pockets siting out there" (30337).
- "The first thing that pops into my mind would be to have a better education of the corps regulatory branch to use mitigation banking.... You're dependent upon the regulators at the corps of engineers to give you business, to send customers your way and it appears that they don't use mitigation banking as much as we feel they should. Of course we're prejudice but we feel they try everything else before they use mitigation banking. I think there should be a little more education as to what goes into mitigation banking to the regulators so they can recommend it more often" (16226).

"In Lieu Fee"

- "Well I think the only thing that I would change about banking in general is that we prohibit the activities of regulators in the banking area. That we would prohibit any regulator from owning or operating mitigation banks. And I don't think there should be an

in lieu fee fund either because it is a very easy way of losing track of what we are trying to restore. I think the banking industry, the way it is structured now has been very direct, fairly simple and has been effective" (09110).

- Abolish in lieu fee program nationwide. That they are an absolute total sham rip off of the environment, the taxpayer, the environmentalist" (18250).

"Nothing"

- "Off the top of my head I don't think there would be anything that I would change I think it's a pretty good balance" (23282).
- I don't really feel strong on anything, one way or another. It's been fine, it's done well for us, we're pleased with it" (12174).

"Service Area"

- "Larger service areas and more generous credit ratios" (0549).
- "I would choose service area to be expanded. And I choose that not selfishly, but biologically. I think that if a BIG bank on a good site is done well, the environmental benefits are HUGE. And the small service area drives smaller, less valuable banks, scattered across the landscape. That's one thing I would change" (31357).

"Agency Agreement"

- "I'd like to see a better coordination between the regulatory agencies in the approval process. D: Ok, So the various agencies that your working with? R: Yeah they need to work in harmony a little better" (0323).
- "Make the states' law and the federal law congruent. There are times that the two laws direct us in opposite directions" (15220).

"Requirements/Process"

- I would try to put less of a command and control structure, I would try to I would have less of a regulatory structure" (0441).

"Other"

- "Fewer competitors I guess" (0689).

"Natural"

- "Well I think, just like I said, being able to pick sites based on where they should be ecologically instead of having them be sites that people propose to us because they happen to have the land" (24296).
- "Well for us it would be to make more of a natural area that is less engineered" (0440).

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