

# Protecting Tomorrow:

## The Roles of Private For-Profit and Nonprofit Organizations in Mitigating Resource Impacts of Infrastructure Projects

The Corpus Christi Metropolitan Planning Organization



Prepared for the Corpus Christi Metropolitan Planning Organization by SONRI, Inc.

April 2010

## **Protecting Tomorrow:**

### **The Roles of Private For-Profit and Nonprofit Organizations in Mitigating Resource Impacts of Infrastructure Projects**

#### **Introduction**

An important thread in the history of America is the dynamic tension between man and our environment. The commercialization of natural resources such as wood, food plants and animals, and minerals drove the great western migration and the creation of an economic powerhouse. Even in the Information Age, natural resources provide the basic building blocks of the machines and infrastructure that allow mankind to build an economy of ideas. But this history is also fraught with examples of exploitive practices that have resulted in the outright destruction of many resources and the pollution of others to the point that they are no longer useful to man.

Over the past 150 years public opinion, federal, state, and local law and policy, and economic reality have come together to create both a demand and desire to find a balance between the built environment of man and the resources and denizens of the natural world. Vast areas of land have been set aside as parks, wildlife areas, forests, and scenic vistas to ensure that future generations can both enjoy and use the resources they contain and support. Laws and policies have been put in place to prevent and correct practices that have polluted our air and water. And private citizens, acting alone and in groups, have both taken on the burdens of land and resource stewardship and advocated for further political action to protect our natural resources.

Nowhere has the effect of this dynamic tension been more evident than in the development of America's infrastructure. Highways, roads, dams, bridges, water and wastewater utilities, ports, canals, communications infrastructure, and other facilities are essential both to human health and safety and to the support of commerce and our economy. But the building of infrastructure requires that the natural world be shaped and changed to fit the needs of man. Thus to create the infrastructure necessary to human life, man must destroy or alter the very resources we depend upon to support that life.

These negative impacts became more and more evident and alarming in the middle decades of the last century, and led to a national debate about the policies and practices for the use of natural resources. In the realm of infrastructure development, a fundamental protocol was established to address the negative impacts of construction. This "mitigation protocol" offers a simple, three step hierarchy of design practices: 1) Avoid impacts on natural resources entirely whenever possible; 2) Minimize impacts on natural resources to the greatest degree possible; and 3) Compensate for the negative impacts of construction on natural

resources when avoidance and minimization are not enough. The third step in this protocol, Compensate, is today accomplished primarily through “mitigation”, and has led to the creation of many new practices and even whole financial markets in the past 30 years.

Merriam-Webster’s Online Dictionary (<http://www.merriam-webster.com/dictionary/>) defines “Mitigation” as: “**1** : to cause to become less harsh or hostile : **mollify** **2 a** : to make less severe or painful : **alleviate** **b** : **extenuate**”. In the practice of infrastructure development mitigation often refers to efforts to completely recreate resources or otherwise compensate for resources destroyed or harmed by construction. Thus under the “no net loss” policy for wetlands management (see Background) when a wetland must be destroyed to build a new road, a wetland of equal size and commensurate natural resource value must to created elsewhere and managed long term to mitigate for that destruction.

While these actions can be and often are undertaken by governmental entities, private sector entities have emerged in the past 30 years that complement and enhance the effectiveness of governmental efforts. Private, for-profit mitigation and conservation “banks” and nonprofit conservation organizations provide new ideas, new practices, and increased capital that have taken the concept of mitigation from that basic one-for-one compensation mentioned above and expanded it to produce a portfolio of ecological services that promises to revolutionize not just infrastructure development, but our entire model of land use planning in America.

This paper offers insights and analysis into these private sector activities, and suggests actions to be taken by the Corpus Christi Metropolitan Planning Organization (CCMPO) and other entities to develop and maximize the benefits of partnerships with nongovernmental organizations in the future growth of the Coastal Bend region.

## **Background**

In 1958 Congress passed the *Fish & Wildlife Coordination Act* (FWCA) which, for the first time, required the U.S. Army Corps of Engineers (USACE) to seek the inputs of both federal and state fish and wildlife regulatory and management agencies in the development of projects that impact water resources. Further, FWCA requires that USACE consider adoption of specific recommendations from those agencies into plans for federal water resource projects or as conditions for the issuance of permits. This was the first tangible step toward the active mitigation protocol and widespread practices of today, though mitigation as a concept and a policy was primarily focused on wetlands until the 1990s.

Mitigation was given a major boost in the passage of the *Clean Water Act* (CWA) in 1972 and its reauthorization in 1977, when water quality standards were strengthened and greater protections put in place. CWA establishes a shared authority for the protection of water resources between USACE and the U.S

Environmental Protection Agency (EPA), and Section 404 of CWA codifies the “avoid, minimize, compensate” protocol and guidelines for applying the protocol to federally sponsored or permitted projects. This was formalized into policy through Executive Order 11990 *Protection of Wetlands* issued by President Carter in 1977, which directs federal agencies to: “...avoid to the extent possible the long and short term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative...”. This has the effect of forbidding the use of federal funds in projects that adversely impact wetlands without mitigation of those impacts.

These seminal laws and policies resulted in the reinterpretation of laws as old as the *Rivers and Harbors Act* of 1899, and sparked widespread debate about the practical implementation of the protocol. Adding fuel and information to the debate were a number of studies conducted in the 1970s and 1980s by USACE, universities, other federal and state agencies, and private contractors that showed that over 50% of the wetlands in the continental United States had been destroyed since the founding of the nation. The outcome of this debate was the adoption of a “no net loss of wetlands” policy goal by President George H. W. Bush in 1988, and the codification of that goal into agency policy by all federal resource management and regulatory agencies. Many states subsequently passed laws or adopted similar policies.

While the policy debate raged, federal highway and building construction projects moved ahead, states adopted a number of approaches to complying with federal law, private industry sought affordable solutions to regulatory compliance, and private nonprofit conservation groups sought to protect resources. Project managers knew they had to mitigate for harming or destroying a wetland, and did so on a case-by-case basis working with regulators who interpreted law and policy in different ways on a seemingly random basis. This added costs to projects, caused delays, and was generally unsatisfactory to all involved.

Forward thinking people in both the private conservation sector and state and local government began espousing the idea of establishing “banks” for mitigation in the late 1970s. The basic idea was simple: 1) take an appropriate piece of land and create a wetland on it; 2) ask the responsible regulatory agency to recognize this newly created wetland as meeting the compensation requirement of the protocol for mitigation on construction projects; 3) apply the acreage of that new wetland to mitigate for on-the-ground construction projects on a one-for-one basis until the acreage of the new wetland is all accounted for. The primary benefit to be gained is in step 2, where the parties go through the process of meeting the compensation requirements in advance. This eliminates much of the time and additional cost that case-by-case mitigation produces in construction projects.

This concept was first put to the test in 1980 with the creation of the Bracut Marsh Mitigation Bank by the California Coastal Conservancy. A combination of private companies and the City of Eureka, California paid the Conservancy to restore the 14-acre Bracut Marsh to address wetland losses in the area. It is significant to note that this first effort was undertaken by a private entity, with a combination of private and public funds. While the project itself was less than successful and required a complete rework in 1999, it set an important tone of public-private partnership and leveraging of funds that holds true to this day.

The next bank was not established until 1984, and various small-scale projects followed throughout the 1980s. The first mitigation bank focused solely on transportation project mitigation was established by the State of Wisconsin in 1989 with the creation of the 160-acre Patrick Wetland Mitigation Bank to service Wisconsin Department of Transportation projects. Transportation infrastructure projects have been and will remain the primary drivers of demand for mitigation in America for the foreseeable future, though the concept of mitigation has spread to other types of natural resource management and has evolved in recent years to include sophisticated concepts of a package of ecosystem services that may be derived from banks.

### **Private Sector Mitigation**

The second mitigation bank was created by Fina Oil & Chemical Company in Louisiana in 1984 to mitigate for the impacts of oil and gas exploration in marshlands. Unlike Bracut Marsh in California, this bank had only a single user, and was established by a commercial entity as a cost management measure. The most significant difference with Bracut Marsh is one of scale, both physically and in terms of the various regulatory agencies involved. The Fina La Terre Mitigation Bank spans some 7,014 acres of marshlands and its approving agencies included the U.S. Fish & Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), the U.S. Soil Conservation Service (now known as the Natural Resources Conservation Service, or NRCS), Louisiana Department of Natural Resources, and Louisiana Department of Wildlife & Fisheries. It is important to note that neither USACE nor EPA, the two agencies tasked with CWA oversight, are signatories to the establishing agreement. This set new precedent and laid the foundation for the creation of the concept of conservation banking in the 1990s.

Parallel to the development of mitigation banks, a new approach to forestland investment and management emerged in the 1970s. In 1976, the Lyme Timber Company of New Hampshire began acquiring forest assets to manage them in a more sustainable manner than previous practices allowed, and began seeking investment dollars from conservation-minded wealthy individuals. This proved to be a popular way for the wealthy to both express their desire for resource conservation and enjoy a reasonable return on their money. In the early 1980s,

institutional investors such as retirement funds also began putting funding into this small but growing niche of the investment sector.

It did not take long for the proponents of wetlands mitigation to identify potential synergies with the new forestlands investment model, but legal and policy impediments stood in the way. Most significantly, neither nonprofit conservation organizations nor government entities could offer returns on investment. Additionally, the regulatory agencies involved had an institutional distrust of commercial ventures, despite the success of Fina La Terre.

To address these issues, the financial and nonprofit conservation sectors came together and formed partnerships. Funding for mitigation banks would be developed by selling interests in investment funds, much like the mutual funds that were so popular in the 1980s. The commercial firm would then partner with a nonprofit conservation organization to restore the resource, and the nonprofit conservation organization would take on the long-term responsibility of managing the land. The commercial partner would then sell the mitigation credits created by the restoration, with a part of the proceeds flowing through to the nonprofit partner to pay for that long-term management. Lyme Timber and other forestland investment firms expanded their offerings to embrace this concept, and offered their investors the added return of revenue from the sustainable harvesting of timber. Thus was born the modern mitigation banking industry.

With the growing success of wetlands mitigation banks, federal and state regulators began considering how the policy concepts could be applied to other natural resources. In the 1990s the EPA developed a program of carbon sequestration offsets under the Clean Air Act of major, "point source" polluters such as petrochemical plants. Under this policy the polluter could either pay a fine for noncompliance or invest in reforestation projects that would provide for the natural sequestration of airborne carbon particulates by trees. Similarly, EPA fines collected from polluters of either soil or water resources could be used by either nonprofit conservation organizations or units of government to manage for the recovery of some endangered species or the buffering and natural filtering of runoff into streams and watersheds. In the early 1990s the USFWS began authorizing the mitigation of negative impacts on endangered species through procedures modeled off of wetlands mitigation banks, and called these new banks "conservation banks." This line of reasoning has gone on to lead to the concept of "ecosystem services", which states that a single piece of land may offer multiple benefits, from habitat for endangered species, to water quality filtering, to carbon sequestration, to hunting and fishing and other human recreation opportunities. The current cutting edge of thinking is wrestling with how to value and bundle or layer those services in such a way as to truly protect resources while achieving the goals of the protocol and providing a return on investment.

The final factor that enabled the growth of a movement into a true investment industry came in 1995, with the release of the policy *Federal Guidance for the Establishment, Use, and Operation of Mitigation Banks* jointly by the EPA and USACE. While mitigation banks had now become widespread, the process of reviewing and approving these banks and establishing how many credits they could produce was still done on an essentially ad hoc basis, with different agencies and even different federal employees within the same agency applying the policy differently. The uniform policy guidance provided the private sector with a greater degree of predictability in the regulatory process, reducing investor risk and providing the industry with a more accurate way to assess costs. This led to a boom in the industry, from just 42 approved mitigation banks in 1992 to at least 320 mitigation banks in 2002. Today the number of mitigation banks in the United States is estimated at over 1,000, and there are nearly 200 conservation banks.

### **How Mitigation and Conservation Banking Works**

As stated above, early mitigation banking assumed a one for one ratio of created or restored wetland for every acre of wetland impacted by a construction project. Regulatory scientists quickly saw that this simple formula would not be sustainable, since different wetlands contain different ecosystems and provide differing quality of resources. A variety of formulae were developed to convert the acre-for-acre approach into “credits”, and the 1995 rule established a single formula and protocol for its application. In 2008 USACE and EPA issued what is commonly called “the new rule” that amends and clarifies that policy and streamlines procedures.

The market establishes the monetary value of a wetland or other resource credit. Driven by the economic law of supply and demand, willing sellers (the bankers) come together with willing buyers (such as the project partners developing a new highway) and negotiate a sale price. Bankers factor in the costs of acquisition and restoration of the resource, as well as the costs of long-term management of the resource and the percentage return on investment their business model requires. Buyers consider how the convenience and efficiency of purchasing established credits compares to the cost of case-by-case mitigation, which is still a viable regulatory alternative. Recent sales of credits offer a benchmark in much the same way as an appraisal provides an opinion of value on a house.

But to reach this point, bankers must first have acquired and restored the resource. This is a capital intensive venture, requiring the ability not just to purchase land, but also to invest in the restoration or even creation of soils, hydrology, plants, habitat, and other elements of the ecosystem that were the original result of natural processes. They also must coordinate this effort with the appropriate regulatory agencies, and acquire letters of opinion from those agencies that establish the type, number, and quality of credits that may be sold. Those banks that follow industry best practices also establish a partnership with a nonprofit conservation organization that will be responsible for the long-term stewardship of the land. Indeed, it has become common practice for the regulatory agency approving the

banking instrument to require at least that a conservation easement be transferred to a nonprofit partner, giving them a legal stake in the process and providing for perpetual monitoring and enforcement of the easement. The inclusion of a nonprofit partner also offers assurance to the regulatory agencies concerned of both the goodwill of the banker and the longevity of the planned resource management. However it is important to note that bankers are not required by law to include a nonprofit conservation partner, merely to establish escrow funding to pay for management.

In order to raise capital to establish and restore the bank, bankers sell shares or interests in the bank using the same investment model of common stock investment funds. These shares are not publicly traded (though some banks have plans to move into the public markets when economic conditions permit) but are marketed directly to private and institutional investors. Compared to most stock funds, the return on investment for mitigation banks is in the medium to low end of the spectrum, ranking well above most money market funds but well below higher-risk instruments. A typical return on investment for mitigation banks is between 5 and 8%. Mitigation bank investments also require a longer payout than stock funds, since it takes a considerable amount of time to acquire and establish the wetland or other resource, obtain regulatory concurrence, and market the credits.

Firms like Lyme Timber hybridize the process by including the production of agricultural products (most often timber) on mitigation lands. This adds complexity to the regulatory transaction and long-term management, but also enables offering investors a higher return with lower risk through the revenue stream of the agricultural production. Typical return on investment for these “hybrid” banks is in the 10 to 15% range. This type of bank is by far the most popular to form in the industry, but also limits the availability of banking to those regions with productive timber forests.

While the returns offered by mitigation and conservation banking are not as high as more common investment interests, it is nonetheless estimated that the total value of investment in mitigation and conservation banks exceeds \$6 billion. There are two factors other than return on investment to keep in mind that make the market what it is. The first is investor motivation.

Whether private individuals or institutions, investors in mitigation and conservation banks must be what is known as “patient money.” In other words, they must be willing to wait longer to receive their returns due to the length of time required to create and market the mitigation credits. Most individual investors in this market are already wealthy, and their prime motivation for the investment is to promote resource conservation or otherwise be a good citizen and support the greater good. Return on investment is a secondary factor. Similarly, institutions invest in the market in support of their own organizational or public policy to promote conservation. As long as they do not lose money, they get a return both from the goodwill of the act of conservation and from supporting policy goals.

The second factor that enables the mitigation and conservation banking market is the investment of public funds in both the input and output of the market.

### **Public Funding for Mitigation and Conservation Banking**

Public funding is an important part of the mitigation and conservation banking business model both as capital investment to create credits and as revenue in the purchase of credits to mitigate public projects. Another important motivation for bankers to partner with nonprofit conservation organizations is to qualify their projects for federal land protection program grants. The Land & Water Conservation Fund, Forest Legacy Program, Farmland Protection Program, Coastal and Estuarine Land Conservation Program, North American Wetlands Conservation Act Grants, and other federal programs may be used to leverage the private investment of the banker to acquire land, restore or create resources, and provide for their ongoing management. Similarly, a variety of state and local governments offer grants. In most cases, these grants have significant limitations on their use and demand carefully documented public benefits in return, which tends to limit their ultimate value in the banking business formula. Nonetheless, many banks would not exist without such funding. In 2009, the U.S. Department of Defense (DoD) became the first federal agency with specific authority from Congress to invest directly in conservation banks for the purpose of creating credits that would accrue back to DoD for future mitigation purposes. To date, that authority has not been exercised.

Possibly even more important to the bankers' business model is the ability to count on revenue from public projects in need of mitigation credits. New highways, road expansions, bridge replacements, new interchanges, and construction of new public buildings and facilities all produce a demand for credits. This demand is relatively predictable due to the long-term nature of government budgeting, design, and construction. Federal Highway Administration (FHWA), DoD Military Construction, and USACE budgets are all of great interest to mitigation and conservation bankers, and they work actively to support and advocate both federal and state funding for projects.

### **Current Mitigation and Conservation Banking in the Coastal Bend**

The USACE "RIBITS" online database (Regional Internet Bank Information Tracking System) provides the definitive source for listing all approved mitigation banks in America. No similar resource exists yet for conservation banks, though the USFWS has stated intentions to develop one. Instead, an informal listing of conservation banks is maintained on a volunteer basis by the National Mitigation Banking Association (NMBA).

RIBITS lists eight mitigation banks in Texas. All are overseen by the Galveston District of USACE, and none provide services west of the Houston metropolitan area.

Two are owned by the Texas Department of Transportation (TXDOT), one by the Harris County Flood Control District, and five by mitigation bankers, though one of these is currently listed as “suspended” by USACE and is not currently selling credits. TXDOT is rumored to be considering selling their two banks.

The NMBA conservation banking information listed only one conservation bank in Texas as of their latest survey in late 2008. This bank is the Williamson County Karst Conservation Foundation, focused on mitigation for the endangered Bone Cave Spider in the Austin area.

The Coastal Bend Wetland Mitigation Bank, owned by the Port Bay Hunting and Fishing Club is currently seeking approval of their banking instrument by the Galveston District of USACE. The bank is to offer 130 initial credits on 540 acres of wetland, and Ducks Unlimited will hold a permanent conservation easement to oversee long-term management. While regulatory processes are never certain, the bank’s manager is confident that sale of credits will begin in the summer of 2010. The bank is a good example of the multiple benefits to be derived from banking activities, in that Ducks Unlimited is to provide outdoor education opportunities for school children on the land, and the landowner will derive additional revenue from the sale of hunting leases.

Given the lack of existing mitigation or conservation banking opportunities, two questions arise: 1) is there some lack of opportunity or demand that has kept the private banking industry from investing in the region; and 2) if demand and opportunity exist, how can the Corpus Christi MPO and its member jurisdictions encourage market development and reap the benefits of partnership?

### **Assessing the Need and Opportunity**

The existence of marshes, wetlands, swamps, and tidal flats is a fact of life in the CCMPO service area. Geology, hydrology, and soils of the region are highly conducive to the formation of wetlands, and the vast majority of transportation infrastructure projects have at least some impact on a wetland. The need for CWA Section 404 wetland mitigation is a given.

Similarly, geology, hydrology, soil, and habitat are also highly conducive to an exceptionally diverse biology for the region. Plants, birds, fish, mammals, insects, and invertebrates all benefit from the complex interactions of salt and fresh water, mild climate, nutrients carried downstream on rivers, and the cycle of coastal flood and drought. As a result, the USFWS lists 12 species as either threatened or endangered in the service area. Of those 12, several are species dependent upon marshes, wetlands, and tidal flats for at least some portion of their life cycle. The likelihood of some degree of impact on those species in infrastructure development is high, and the need for conservation is well known.

As for opportunity, federal and Texas law both authorize banking, and the

regulatory environment in Texas is very favorable to private sector bank development. Indeed, the regulatory environment in Texas has been described by some as lax, and this may be a prime reason why the banking industry has not blossomed in Texas. However federal regulatory policies are tightening at the same time that public awareness of the need for balance between environmental impacts and economic benefits of development is growing. As the mitigation banks in East Texas continue to succeed in helping find that balance, demand is sure to grow in the rest of the state.

### **Connecting the Dots in the Service Area**

Private investment in mitigation and conservation banking in the Coastal Bend could offer many advantages to the CCMPO:

- Leveraging of public funds in infrastructure projects;
- Cost savings through streamlined regulatory compliance in infrastructure planning;
- Cost avoidance through advance mitigation for construction
- Improved water quality in area streams and rivers through natural filtration of stormwater runoff;
- Enhanced carbon sequestration on bank lands through reforestation;
- Enhanced quality of life for area residents through the availability of additional lands for outdoor recreation and education and protection of viewsheds and open space;
- Goodwill and enhanced partnerships with the nonprofit conservation community.

The challenge is in outreach and education within the mitigation and conservation banking community, and encouraging market development through policy and action.

The mitigation and conservation banking industry enjoys the luxury of fairly predictable demand thanks to federal environmental regulations. However the process is not as simple as picking a piece of land and beginning construction of a wetland. Considerable up-front investment goes into finding the best and most cost effective sites for a bank, and specialized knowledge and skills are required to restore or create wetlands, habitat, and other natural features. The population of people with those skills is relatively limited in Texas compared to other parts of the country, so some effort on the part of state and local government to let people in those other regions know about the opportunities that exist would be beneficial.

In the case of the Coastal Bend, the cost-demand ratio is more marginal than in other parts of the country due to more business-friendly regulatory environment and relatively lower costs of infrastructure development. State and local government partnering with both nonprofit conservation organizations and for-profit bankers to attract federal and state grant funding or other public investment

could enhance the profitability of banks and thus encourage their development. An excellent example of this would be the Texas General Land Office, which owns many thousands of acres in the region, partnering to develop conservation banks.

Local and state government investment in geospatial and geographic information systems whose data is made available to the industry can help jumpstart the site selection process and support bank profitability. Similarly, local government support can be an important factor in encouraging regulatory approval of banking instruments and help reduce up front costs. Pooling of demand from several jurisdictions (as would be the case in CCMPO-led planning efforts) can also be an attractive enhancement to business models.

The legal vehicles required for this kind of partnering already exist through cooperative agreements, memoranda of agreement, fee-for-service contracts, public-private partnership agreements, and other common governmental contractual vehicles. Economic development laws are also in place to encourage the growth of new industries. Experience already exists organically within the CCMPO in the development and management of similar efforts.

## **Conclusion**

Mitigation and conservation banking is not only good business it is also good policy. The use of market-driven approaches to supporting public infrastructure development makes good fiscal sense, and offers governmental entities the opportunity to further leverage and enhance the services they provide their constituents. Mitigation and conservation banking can create win-win-win scenarios for infrastructure developers, bankers, and the public.

Mitigation and conservation banks are not a panacea. They require considerable capital and time investment to create, require detailed regulatory approval, oversight, and compliance processes, and carry with them literally perpetual cost trails in terms of long-term management. While both law and policy have matured considerably over the past 20 years, science and engineering are still struggling to perfect the processes necessary to achieve the levels of success envisioned in the law.

Infrastructure development is a key feature in plans for the future of the Coastal Bend region, especially in and around the Corpus Christi Metropolitan Planning Organization service area. In today's economic and budgetary atmosphere, the constituent jurisdictions of the MPO must do all they can to manage costs while encouraging economic development. Reducing regulatory compliance and construction costs will be important factors in the success of future development projects. Investment in developing the capabilities and capacity to participate in the mitigation and conservation banking market and encouragement of the development of local banks would be an excellent policy decision that would reap benefits for the people of the Coastal Bend for decades to come.

## References

*Conservation Banking: Incentives for Stewardship*, U.S. Fish & Wildlife Service, 2009

Department of the Army, Section 404 Permit Regulations (33 CFR Parts 320-330)

Environmental Protection Agency, Section 404(b)(1) Guidelines (40 CFR Part 230)

Executive Order 11990, *Protection of Wetlands*, May 24, 1977, 42 F.R. 26961

Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.).

Fish and Wildlife Service Mitigation Policy (46 FR pages 7644- 7663, 1981).

*Mainstreaming Environmental Markets*, Adam Davis, Solano Partners, Inc. 2004

Memorandum of Agreement between the Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation under the Clean Water Act Section 404(b)(1) Guidelines (February 6, 1990)

National Environmental Policy Act (42 U.S.C. 4321 et seq.), including the Council on Environmental Quality's implementing regulations (40 CFR Parts 1500-1508)

National Wetland Mitigation Banking Study, *The Early Mitigation Banks: A Follow-up Review*, Fari Tabatabai & Robert Brumbaugh , IWR Report 98-WMB-Working Paper, U.S. Army Corps of Engineers, 1998

Rivers and Harbors Act of 1899 Section 10 (33 U.S.C. 403 et seq.)

*Stream & Wetland Mitigation Banking: An Introduction and Brief History*, PowerPoint presentation, Richard K. Morgensen, EarthMark Mitigation Services, 2009

Texas Natural Resources Code, Title 12, Chapter 221 Wetland Mitigation

*The Next Generation of Mitigation: Linking Current and Future Mitigation Programs with State Wildlife Action Plans and Other State and Regional Plans*, Wilkinson, Bendick, et al, Environmental Law Institute and The Nature Conservancy, 2009

U.S. Army Corps of Engineers, Institute for Water Resources, Website,  
<http://www.iwr.usace.army.mil/inside/products/pub/publications.cfm>

U.S. Army Corps of Engineers Regional Internet Bank Information Tracking System  
[http://www.erdc.usace.army.mil/pls/erdcpub/www\\_welcome.navigation\\_page?tm\\_p\\_next\\_page=114145](http://www.erdc.usace.army.mil/pls/erdcpub/www_welcome.navigation_page?tm_p_next_page=114145)

**Prepared in cooperation with the US Department of Transportation, Federal Highway Administration, Federal Transit Administration and the Texas Department of Transportation**



SONRI, Inc.  
[www.sonricorp.com](http://www.sonricorp.com)  
210-387-8628