



## Alternatives to In-Kind Wetland Mitigation in Texas: Summary Report

From playas in the panhandle to freshwater marshes along the Trinity River, from cypress swamps near the Louisiana border to tidal salt marshes along the gulf, Texas is home to a diversity of wetland types. According to Section 404 of the 1977 Clean Water Act (CWA), all activities involving the discharge of dredged or fill material into navigable waters of the United States, including their associated wetlands, must be approved and permitted by the Army Corps of Engineers (Corps).

Due in part to its large size, Texas is very diverse ecologically and has a large number of types of wetlands (see [Table 1](#)). An agency such as the Texas Department of Transportation (TxDOT), which serves the entire state, must be prepared to mitigate every kind of wetland that is impacted and must possess knowledge of the general

Table 1. Types of Wetlands in Texas.

BOTTOMLAND	Lowland among streams and rivers, usually on alluvial floodplains, that is periodically flooded. When forested, it is called a bottomland hardwood forest in the southeastern and eastern United States.
MANGROVE	Subtropical and tropical coastal ecosystem dominated by halophytic (salt-loving) trees, shrubs, and other plants growing in brackish to saline tidal waters. The word “mangrove” also refers to the dozens of tree and shrub species that dominate mangrove wetlands.
MARSH	A frequently or continually inundated wetland characterized by emergent herbaceous vegetation adapted to saturated soil conditions.
PLAYA	An arid to semiarid region that has distinct wet and dry seasons. Term used in the southwest United States for marsh-like ponds similar to potholes, but with a different geologic origin.
SALT MARSH	A halophytic (salt-loving) grassland on alluvial sediments bordering saline water bodies where water level fluctuates either tidally or non-tidally.
TIDAL FRESHWATER MARSH	Marsh along rivers and estuaries close enough to the coastline to experience significant tides by saline water. Vegetation is often similar to non-tidal freshwater marshes.
WET MEADOW	Grassland with waterlogged soil near the surface and with standing water for most of the year.
WET PRAIRIE	Similar to a marsh, but with water levels usually intermediate between a marsh and a wet meadow.

Descriptions taken from: W. Mitch and J. Gosselink (2000), *Wetlands*, 3rd Ed., NY: Wiley.



characteristics of each kind of wetland. TxDOT has recognized the need for a current practice assessment of wetland mitigation alternatives across the country as well as an assessment of TxDOT's wetland mitigation program so that decisions can be made more effectively regarding the future of wetland mitigation at TxDOT.

### What We Did...

Project 0-4545 investigated literature and current practice; performance of previous mitigation efforts; the statutory, regulatory, and policy roadblocks to mitigation alternatives; and appropriate alternatives to in-kind mitigation as well as strategies for implementing them.

A vast quantity of research details the various aspects of wetlands and wetland mitigation, but for this project, researchers narrowed the literature review to the following topics:

- summary of critical issues,
- state and federal transportation research projects, and
- alternatives to on-site mitigation: research, regulatory guidelines, and practices.

In addition, researchers narrowed the assessment of current practice to specific transportation departments,

including TxDOT, after examining information taken from literature, departmental websites, and direct phone conversations with transportation department employees responsible for wetland mitigation. Particular note was given to the favored mitigation options and alternatives, to departmental organization, and to environmental streamlining or partnerships.

Researchers conducted case studies on various TxDOT wetland mitigation sites to document distinct regional characteristics and mitigation practices throughout Texas. The seven districts included in the case studies were Bryan, Corpus Christi, Dallas, Laredo, Lufkin, Paris, and Yoakum. The results of the case studies are documented in Report 0-4545-1, *TxDOT Wetland Mitigation Alternatives: Options and Procedures for In-Kind Mitigation*.

### What We Found...

The review of literature and current wetland mitigation policies and state practices raised several key issues in considering mitigation alternatives. These issues include:

- the role of formalized partnerships and/or agreements with other agencies and organizations to ensure that mitigation

will meet watershed-level ecological needs,

- the historical preference by regulators for on-site mitigation,
- the recent emphasis on the ecological needs of the watershed,
- the role of a centralized decision-making department in forming long-term mitigation goals,
- the need to locate mitigation banks in the same service area of impacts (usually the U.S. Geological Survey watershed),
- the need to maintain mitigation sites in perpetuity,
- the method for weighing costs/benefits with the likelihood of success for each mitigation option, and
- the departmental ability to sufficiently review work completed by mitigation consultants.

The site analysis/delineation showed several sites with positive elements as well as several sites where concerns were noted. One of the positive elements included the formation of partnerships with other state agencies such as Texas Parks and Wildlife and Texas Department of Corrections (see [Figure 1](#)). These partnerships allowed TxDOT to use state-owned land for wetland mitigation





Figure 1. This wetlands site shows an example of a successful partnership between TxDOT and the Texas Department of Corrections.

that continued to be maintained by the partner agency for use by either its employees or the public. Other projects were situated adjacent to rivers that experience regular flooding regimes and have ultimately resulted in the benefit of larger-than-anticipated wetland acreage.

Because of the size of Texas and the decentralized organizational structure of wetland mitigation staff, the mitigation specialization of staff members is a less straightforward task than it would be in smaller states with fewer watersheds to manage. The successful implementation of wetland mitigation alternatives requires upfront planning by experienced staff.

### The Researchers Recommend...

There are several opportunities for wetland mitigation alternatives recommended for consideration within TxDOT and the wetland mitigation community. These opportunities include:

- Transportation Equity Act for the 21st Century emphasis on mitigation banking and environmental streamlining;
- examples of previous, successfully implemented partnerships with agencies for individual wetland mitigation projects;
- hands-on experience and expertise of district environmental staff throughout TxDOT; and

- examples of other states' successful implementation of wetland mitigation alternatives.

In addition, TxDOT should consider using the following steps (discussed in detail in Report 0-4545-1) when determining the appropriate mitigation alternative for transportation projects:

Step One: Avoidance

Step Two: Appropriateness of on-site mitigation

Step Three: Available alternatives within the watershed

Step Four: Off-site project-specific mitigation

Step Five: Partnerships

Finally, Report 0-4545-1 describes six organizational options the Texas Transportation Institute research team recommends that TxDOT explore for managing wetland mitigation processes. These options range from making no organization change to the creation of a Wetland Expert Team (WET), which pools individuals' various expertise in order to address individual mitigation needs.



## For More Details...

The research is documented in [Report 0-4545-1, \*TxDOT Wetland Mitigation Alternatives: Options and Procedures for In-Kind Mitigation\*](#).

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## TxDOT Implementation Status—December 2004

Research project 0-4545 has determined that in-kind, on-site very small wetland mitigation projects can be very difficult and expensive to develop with no real assurance of success. Therefore, TxDOT proposes to follow the Federal Highway Administration guidance released July 11, 2003 (FHWA 24-03). The guidance states that mitigation banks should be used in preference to on-site mitigation for impacts to waters of the United States.

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### YOUR INVOLVEMENT IS WELCOME!

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## Disclaimer

This project was conducted in cooperation with the Texas Department of Transportation (TxDOT) and the Federal Highway Administration (FHWA). The contents of this report reflect the views of the authors, who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of TxDOT or FHWA.

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