

Avoid, Minimize, Compensate:

Infrastructure Mitigation Policy and Implementation in Texas

The Corpus Christi Metropolitan Planning Organization



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Introduction

Section 6001 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) states:

“(i) GENERAL.—A long-range transportation plan shall include a discussion of types of potential environmental mitigation activities and potential areas to carry out these activities, including activities that may have the greatest potential to restore and maintain the environmental functions affected by the plan.

(ii) CONSULTATION.—The discussion shall be developed in consultation with Federal, State, and tribal wildlife, land management, and regulatory agencies.”

This requires Metropolitan Planning Organizations (MPO) to begin the process of planning for mitigation while future transportation projects are still in their conceptual stages, and to undertake this planning in consultation with key regulatory agencies to a greater degree than ever before.

Section 404 of the Clean Water Act (CWA) establishes protocols and policy for the mitigation of negative impacts on the nation’s water resources by construction projects of all kinds. The act establishes a three step protocol of design and construction 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.

Today, the concept of “mitigation” has evolved to be applied many types of resources in addition to water. Impacts to endangered species habitat, air quality, noise, stream banks, prime soils, viewsheds, cultural and historic sites, and many other resources are mitigated for a variety of reasons and in a variety of ways. But no matter what type of resource, the basic protocol of “avoid, minimize, compensate” is universally followed to address the impacts of construction, land use changes, and other human actions on the resource.

This paper examines infrastructure mitigation policy and procedures in Texas with particular emphasis on the mitigation of water resources under CWA and endangered species habitat under the Endangered Species Act (ESA.) It reviews roles and responsibilities of all levels of governmental and quasi-governmental agencies in implementing mitigation policy, and provides key contact information for the major agencies most cognizant of and involved in mitigation. It also examines the emerging and growing practices of air quality mitigation as they relate to the current Clean Air Act and analyzes likely future impacts of new legislation

currently under development by Congress to address global warming as a function of air quality.

Background

The Clean Water Act of 1972 was a direct response by Congress to the disaster on the Cuyahoga River in 1969. Industrial solvents, oil, gasoline, and other lighter than water flammable materials had been dumped into the Ohio river for decades by manufacturing plants in the Cleveland region, and lay floating on its slow moving surface. No one knows how the fire was sparked, but on June 22, 1969 the river became an inferno, with flames said to be five stories high. Though the fire was quickly brought under control and extinguished, film and pictures of the blaze made national news, and the event became a rallying point for environmental action.

The CWA reauthorization in 1977 strengthened water quality standards and put greater protections and penalties in place. CWA establishes a shared authority for the protection of water resources between the United States Army Corps of Engineers (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 was further reinforced by the policy of “no net loss” of wetlands set out by President George H. W. Bush in 1988.

Like CWA, the Endangered Species Act of 1973 was also a result of the heightened environmental awareness of the second half of the 20th Century. ESA goes far beyond the concept of “no net loss,” since it requires the management of habitat and species for the recovery of species numbers above levels at which the survival of the species is endangered. For many years, this had the effect of completely stopping many infrastructure projects that required the destruction of critical habitat. In the 1980s, the U. S. Fish & Wildlife Service (USFWS), the agency tasked with enforcement of ESA, changed its interpretation of ESA to allow for the destruction or “take” of species as long as that take is compensated for in such a way that science reasonably expects the compensation to result in a net gain in species numbers.

Over the past 20 years a number of methods and techniques have been developed to meet the requirements of CWA and ESA laid out in law and policy. At first mitigation was accomplished strictly on a project-by-project basis. The concept of mitigation banking evolved first around wetlands mitigation (see *Protecting Tomorrow: The Roles of Private For-Profit and Nonprofit Organizations in Mitigating Resource Impacts of Infrastructure Projects*, Corpus Christi MPO, 2010) and in the

1990s was extended to species through the concept of conservation banking. In-lieu fee compensation is a somewhat controversial practice that allows the builders of a project to pay fees or penalties for destruction of wetlands or takes of species with the funds spent elsewhere by other organizations to mitigate for project impacts. Species translocation, the moving of plants and animals out of harms way from the construction project to an area of safety is under study for several species, especially in the Southeast. Other variations and permutations of mitigation and resource management, such as the Recovery Credit System, are currently under study and debate, but all implementing techniques share the underlying protocol of avoid, minimize, compensate.

Whether for water resources or species protection, mitigation is a complex, time consuming, and expensive endeavor. Policy and practice seek to balance the economics of mitigation with benefits to the natural resources affected. Corpus Christi Metropolitan Planning Organization (CCMPO) officials and staff must develop a thorough understanding of the interaction of policy and practice, and should incorporate principals in all planning documents that help implementing agencies and member jurisdictions manage the complexity and costs of adhering to both the letter and the spirit of the law.

Wetlands and Stream Mitigation Rules

Under “avoid, minimize, compensate” project planners must first and foremost attempt to avoid negative impacts on wetlands. This is generally accomplished through changes in routing or siting of infrastructure. If avoidance is impossible, planners must then minimize impacts. Both regulatory policy and practice makes the spectrum of how much minimization can be allowed before moving on to compensation a very narrow band. Once avoidance and minimization have been exhausted, planners move on to the concept of “compensatory mitigation.”

Stream bank mitigation is a generally much less mature concept than that of wetland mitigation, and wetland mitigation rules are in use while research and development take place to establish appropriate protocols. The following paragraphs will thus focus on wetland mitigation rules, and revisit stream bank mitigation at the end of the section.

In 2008 USACE and EPA jointly published revisions to the rules governing the issuance of permits for construction projects that impact wetlands and streams. This “New Rule” defines compensatory mitigation as:

“the restoration (re-establishment or rehabilitation), establishment (creation), enhancement, and/or in certain circumstances preservation of aquatic resources for the purposes of offsetting unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved.”

In practical terms this sets out a further hierarchy of potential approaches the permittee can take to achieve mitigation, and the New Rule lays out the procedures required to meet those requirements. The permittee may:

1. Re-establish or rehabilitate a wetland that had been degraded or destroyed by some human action in the past. This must result in a net gain of wetland function, wetland acres, or both;
2. Create a wholly new wetland. This must result in a net gain of both wetland acres and function;
3. Enhance the function of an existing wetland. This must result in an overall improvement in wetland function that offsets the negative impacts of construction;
4. Preserve an existing wetland. This action is very limited in applicability, does not contribute to an improvement in wetland function or increase in acres, and must be tied to ecologically significant resources that contribute to the sustainability of an entire watershed.

There are three distinct mechanisms available to permittees to accomplish one or some combination of the above:

Permittee-Responsible Mitigation: This is the most common form of mitigation, representing about 60% of all mitigation actions undertaken today. The permittee performs the mitigation after the permit is issued and is ultimately responsible for implementation and success of the mitigation, including long-term management. Permittee-responsible mitigation may occur at the site of the permitted impacts or at an off-site location within the same watershed.

Mitigation Banking: This is the fastest growing type of mitigation, accounting for approximately 35% of all mitigation today. In this type of mitigation, a third party acquires land and undertakes one or more of the actions above, applies to USACE for recognition of that action and quantification of some combination of wetlands function and acres, then sells that “credit” to a permittee. Mitigation banks can be established for a special purpose that serves only one permittee, or to offer credits on the open market to any buyer. Permittees must have the concurrence of the regulatory agency to apply credits to their project. **NOTE:** Federal policy states that mitigation banks are preferred above all other forms of mitigation, but this preference is described as “flexible” and is at the discretion of the federal regulatory agency involved in oversight of a specific project.

In-Lieu Fee Mitigation: In-Lieu Fee mitigation generally takes place after the impact has occurred to the resource. It is modeled on the use of air and water quality permit violation fines to compensate for pollution. Funds are provided to a third party sponsor (either a public agency or nonprofit organization) and are used to accomplish mitigation that compensates for the impact. Usually that sponsor pools funds from multiple permittees to develop a larger mitigation site similar to a mitigation bank, with the primary difference being the timing of the mitigation itself.

The ultimate key to the success of any of the approaches above is the determination of how much mitigation is required and whether the mitigation accomplished meets the need. This is a subjective process dependent upon the opinions and judgment of technical experts who represent the permittee and/or banker or sponsor, the regulating agency, and other interested parties. It depends upon a number of factors, the most salient of which are:

1. Impact to the resource. Though it is not a best-case scenario, total destruction of a wetland is in many ways much easier to quantify than some degree of impact. While extensive scientific research is completed and underway, and complex computer models are available, there is still much that is simply unknown about how wetlands form and operate. Measuring the functionality of a wetland (e.g. how much silt or pollutants it filters, how much carbon it sequesters, how many and what type of flora and fauna use it for habitat, etc.) is extremely difficult, and will remain so for the foreseeable future. Efforts are currently underway to define and quantify these “ecosystem services” and provide economic tools to relate them to the built environment.
2. Mitigation site selection. First and foremost, the mitigation site must be, in the opinion of experts, “ecologically connected” to the impact site. The New Rule requires that mitigation sites be in the same watershed as impacted sites. This “watershed approach” is somewhat controversial, as it takes the concept of “no net loss” and focuses work geographically. This approach may be particularly problematic in urban settings where open land is unavailable or in small coastal watersheds with steep geology. It may also be problematic in very large watersheds with great variation in geology, hydrology, flora, and fauna where the concept of ecological connection may be debatable. EPA’s National Hydrology Dataset is used to define watersheds and guide technical review.
3. Technical feasibility. Modern construction technology allows us to build an artificial wetland literally anywhere. Soils and plants can be introduced, hydrology engineered, and water pumped to any location. The rules use a sustainability test to govern the degree of human intervention required. The ideal wetland creation or restoration is one in which no active management will be required to maintain the existence or the wetland or its functionality. This is generally impossible to achieve, and mitigation agreements spell out in great detail the actions required by the permittee, banker, sponsor, or combination of interests to produce and maintain the wetland acres and functionality required in perpetuity.

A number of other factors such as economic viability, financial assurance, inclusion of upland areas in management plans as buffers or for other reasons, and others go into the planning for mitigation and may be spelled out in the agreement document.

Steps in the Mitigation Process

1. Identify the need. The need to mitigate is identified early in the design process (and under the new SAFETEA-LU guidance during conceptual planning to some degree) and agreed upon by permitting agencies using the “avoid, minimize, compensate” protocol. **NOTE:** in order to use the In-Lieu Fee mitigation mechanism permittees must have the prior approval and agreement of the regulating agencies.
2. Quantify the mitigation required. As design continues, wetlands are identified and studied to determine their size and functionality. In highway construction this is a collaborative effort between the permittee, state and federal permitting agencies, design firm, and related regulatory agencies (such as USFWS.)
3. Propose a mitigation approach and mechanism. The permittee and design firm seek to balance environmental need with cost and propose a mitigation approach (re-establishment/rehabilitation, creation, enhancement, or preservation) and mechanism (permittee-responsible, banking, or in-lieu fee) to the regulatory agencies. This begins a process of consultation and negotiation in which the following steps are often performed concurrently. In the case of in-lieu fee mitigation the parties proceed to drafting a formal agreement.
4. Requirement consultation. As the permittee and design firm begin mitigation design, all parties involved consult to reach consensus on whether the approach and mechanism proposed achieves the mitigation required. If consensus is reached mitigation design continues, if not, the permittee and design firm either adjust plans or start over to meet requirements. If the choice is to use a pre-approved mitigation bank, the parties proceed to the drafting of a formal agreement.
5. Mechanism/design approval. During the consultation/negotiation process the interested parties review and modify designs and requirements as new knowledge arises and as other conditions change. The end result is a conceptual approval of the approach, mechanism, and specific design of the mitigation required. This may take the form of a specific mitigation project, or may identify an appropriate existing and pre-approved mitigation bank from which the permittee may purchase the necessary credits.
6. Formal agreement. A mitigation agreement is negotiated and finalized that includes detailed information on the approach, mechanism, design, timeline, costs, financial assurances, long-term monitoring and management plans, and other elements intended to ensure that the no net loss goal is met in perpetuity.
7. Construction. If the permittee-responsible mechanism is used construction takes place as near simultaneously as possible with the degradation of the impacted resource. In the case of both the mitigation banking and in-lieu fee approaches financial transactions take place that provide either credits or funding for future mitigation.

8. Long-term monitoring and management. Permittee-responsible mitigation requires regular and perpetual monitoring and management of sites, including regulatory reporting and oversight. Mitigation bankers and in-lieu fee sponsors provide the long-term monitoring and deal with regulatory requirements if one of those mechanisms is used.

It is important to note at this point the three different types of permits which may be issued for projects. Depending upon their scope, which agency is the permittee, and the specifics of the particular project, USACE may issue either a project-specific Standard Permit that applies only to a single project, or may recognize the project as qualifying under a General Permit. General permits, like mitigation banks, were developed to help streamline and rationalize the permitting process, and may be issued on a national, regional, or local level. Beginning with the assumption that, except in certain circumstances, a wetland is a wetland, a series of common conditions, project elements, and likely impacts are recognized by all the regulating agencies involved, and permittees must merely demonstrate how the specifics of their projects attain. The ultimate goal of USACE is to be able to use a combination of general permits and mitigation banks to greatly speed the entire mitigation process, but due to the wide variation in specific circumstances and the almost ubiquitous nature of endangered species this will likely remain a goal that is only achieved occasionally. The final type of permit is a Letter of Permission, which while not as timely as a General Permit is a much faster process than the Standard Permit. The Letter of Permission requires previous coordination with cognizant state agencies.

Stream bank mitigation follows the same rules, sequence of events and procedures as wetland mitigation. The difference between the two lies in the greater scientific understanding of the functions and ecosystem services of wetlands versus the functions of stream bank riparian zones. While our understanding of wetlands is incomplete, it is much greater than our understanding of riparian zones. In addition, construction along stream banks has a much more evident and immediate impact on water quality and water users downstream from the construction site. The quantifying of mitigation is also different, since instead of acres of wetlands permittees and regulators are concerned with linear feet of stream bank.

Another fundamental difference in stream bank mitigation is one of bureaucratic culture. For many decades, the primary mission of the civilian side of USACE was focused on the navigability of the Waters of the United States and flood control. This led to the channelization of many streams and the building of dikes, dams and levees that dramatically changed the hydrology of many watersheds. Only in recent years are we beginning to understand the functions of natural stream meander and erosion, flood plains, riparian runoff filtering, and natural impediments to the velocity of stormwater. This is requiring a major shift in both the policy and culture of USACE, and this shift is not without resistance inside the bureaucracy.

Roles and Responsibilities for Wetland and Stream Mitigation in Texas

So who are the players in wetland and stream mitigation for transportation infrastructure in Texas? What are their roles and responsibilities? How do they interact with each other? In general, the interested parties can be grouped into three broad categories: 1) Advocates and Implementers, 2) Stakeholders, and 3) Regulators.

Advocates and Implementers

These are the agencies, jurisdictions, and contractors responsible for planning and constructing infrastructure. They include the Texas Department of Transportation (TXDOT), MPOs and Councils of Government (COG), city and county planning and public works departments, design and construction firms, and consultants. Their roles in mitigation include:

- Long-range planning: TXDOT, MPOs, COGs, and city and county planning departments are responsible for identifying current and future needs for transportation infrastructure and proposing plans to address those needs. MPOs in particular at this point are advocates for future projects who are required by Section 6001 of SAFETEA-LU to identify the need and plan for mitigation of future projects. Design and consulting firms usually play major roles in supporting public agencies in all phases of planning. Outreach to stakeholders is a major element of these processes.
- Design, funding, and right of way (ROW) acquisition: TXDOT and city and county planning and public works departments take the lead roles in estimating and budgeting the costs of specific projects identified in long-range plans as they are scheduled for construction. At this point specific design begins, and characterization of wetland and stream impacts lead to the identification of specific mitigation needs. ROW acquisition may include acquisition of land suitable for mitigation. It is during this stage that initial prospectuses of mitigation projects are submitted to regulating agencies and the approach and mechanism for mitigation are identified. Again, outreach to stakeholders is an important element in this phase of a project.
- Permittee: the lead agency in design and construction of the project now becomes the permittee in the eyes of regulating agencies. This is the agency responsible for all coordination and negotiation of the mitigation agreement, and for implementing that agreement in the short and long term. Mitigation bankers or in-lieu fee sponsors may become the

permittees partners in achieving mitigation, but the permittee is ultimately responsible.

- Construction: Private firms under contract to the lead agency undertake the vast bulk of actual construction, but construction may also be undertaken “in-house” for a variety of reasons. During construction the permittee is responsible for ensuring that impacts to resources do not exceed those that were planned for, and works closely with the construction firm, consultants, and regulators to monitor work and adjust plans as needed.
- Long-term monitoring and management: in the same way that a road must be maintained and periodically resurfaced, mitigation projects must be monitored and managed in accordance with the requirements of the mitigation agreement. Permittees who selected the permittee-responsible mitigation mechanism must provide for this long-term commitment, while the other mechanisms require periodic oversight to ensure that the mitigation banker or in-lieu fee sponsor is meeting the requirements of the agreement.

Stakeholders

This category includes a broad spectrum of interested parties that range from the general public to federal agencies who may have regulatory responsibilities that are impacted indirectly by infrastructure construction or mitigation. Landowners who are approached to sell right of way, potential users of the new or improved transportation infrastructure, members of nongovernmental advocacy and resource organizations, and other groups and individuals are examples of general public stakeholders. Local governmental and quasigovernmental agencies may also be stakeholders. A river authority may have jurisdiction over a streambed, school districts may have an interest in the siting of infrastructure, flood control districts may be concerned with impacts to stormwater capacities. Examples of State agencies who may be stakeholders include the Texas Parks & Wildlife Department, who may play a resource conservation advocacy role, the General Land Office, who may be a landowner of ROW and/or may have some regulatory interests in coastal areas, TXDOT (in the case of purely local road and bridge construction) may have interests in how local infrastructure will impact the state system, etc.

- General public stakeholders: landowners in and adjacent to the ROW corridor identified for a new road or major expansion of existing infrastructure are motivated by many different factors. The road may significantly change the value of their land because it changes the potential highest and best use of the property. Giving up land for ROW

may negatively affect the ability of a farmer or rancher to produce their products, or even split farms and ranches into multiple parcels. Questions of economic equity and private property rights are more and more often the objects of litigation and legislation in America.

Advocacy groups may form around the issues mentioned above or for the purposes of protecting natural, cultural, recreational, or other resources. Transportation users, especially users of alternative transportation such as bicyclists, are becoming more active and sophisticated in their demands for equal treatment with motorized vehicles in transportation projects. Neighborhood associations and parental groups may have concerns about safety, noise, air and water quality, and changes to land use that may occur due to infrastructure development.

There are numerous opportunities for the general public to input into infrastructure planning processes, and one motivation for Section 6001 of SAFETEA-LU is to ensure more transparency in all aspects of infrastructure planning. However the knowledge and sophistication of general public stakeholders about how transportation planning works and how to appropriately voice their interests varies widely, and notification about planning processes lags behind modern communication technologies. Thus infrastructure advocacy and implementation organizations are often faced with a daunting outreach and education effort to garner the political support necessary to fund and build projects.

- Local governmental and quasi-governmental organizations: Schools, hospitals, fire and police agencies, utility districts, flood control districts, economic development corporations, river authorities, port and airport authorities – these are just some examples of the myriad of organizations authorized under Texas law to perform various functions for the benefit of the state. Each is focused on providing some service to the people of its service area, and each is tasked with advocating for the opportunity and means to perform their service.

Agencies that have some cognizance or mission concerning water and other natural resources play particular roles in wetland and stream bank mitigation. River authorities are often charged in their charters with protecting water quality that may be impacted by infrastructure projects. Infrastructure projects often impact hydrology and add impervious cover that may exacerbate the challenges faced by flood control districts. Ground water districts may have concerns about the impact of infrastructure on karst features and loss of water quality filtering functions in wetlands and streams.

The role of each of these stakeholders is to be aware of infrastructure planning, review those plans for possible impacts to their missions, and speak out during the planning process. Unfortunately many of the same impediments to understanding and communication that complicate the input of the general public into planning processes also affect the input of agency stakeholders. Infrastructure advocacy and implementation organizations can reduce some of these impediments through the use of contact databases and notifications through clearinghouse agencies like COGs.

- State agencies: state agencies may play both stakeholder and regulatory roles in infrastructure projects, and in some cases one division of an agency may be a stakeholder while another is a regulator, but the two divisions may not be aware of their related role and interests. Some agencies may have roles as transportation advocates that are not immediately apparent, such as the interests of the Texas Department of State Health Services in advocating for bicycle and pedestrian infrastructure to provide the public with the opportunity to exercise to fight the obesity and heart disease epidemics. The following is a review of the roles and responsibilities of some state agencies as stakeholders, but is not an exhaustive list.

The Texas Parks & Wildlife Department (TPWD) is tasked with a dual mission of providing recreational resources for people and protecting plant and animal resources. In a wetland or stream bank mitigation process their interest may be in protecting public access to the resource for recreational or educational purposes, or in protecting species habitat. As such, TPWD may provide unsolicited comment on infrastructure plans during the normal public review process, or permittees and planners may seek TPWD review and comment through the formal Wildlife Habitat Assessment Program. Such review is required by Texas law in the cases of endangered or threatened species impacts for species listed by the State of Texas. TPWD is the lead agency for maintenance of the state-level endangered and threatened species list (which is similar but not identical to the federal list), and for permits for the take and mitigation of impact on those species. See Regulators below.

- The Texas Department of Agriculture (TDA) plays an advocacy role in the development of infrastructure to support agricultural commerce, such as the Texas Farm-to-Market or Ranch-to-Market Road System, as a defender of family agricultural and agricultural heritage, and as funder of infrastructure development in non-entitlement communities through the Texas Capital Fund.
- The Texas General Land Office (GLO) is both a major landowner in Texas and a regulator of coastal resource impacts. GLO often partners with

economic development corporations and private commercial interests to develop projects on GLO lands to produce revenue for the Permanent School Fund. GLO may partner with local government and/or TXDOT to provide ROW for infrastructure improvements such as interchanges, overpasses, and on and off ramps that increase the accessibility and thus marketability of GLO properties.

The GLO Coastal Management Program has a dual role similar to that of TPWD, in that it is responsible for providing access to coastal recreational resources and for protecting coastal natural resources. See Regulators below.

- In similar and related fashion to TDA, Texas AgriLife Extension Service plays an advocacy role for the promotion and protection of farming and ranching commerce and heritage, and the provision of infrastructure to support it. It plays an important role in the education of farm and ranch landowners about the importance of maintaining and buffering wetlands and streams, and the ecosystems services water resources provide to agriculture, and may consult with them about the impact of infrastructure projects on their property and productivity.

Regulators

State agencies have regulatory duties both as tasked by Texas law and in exercising authorities delegated by federal agencies. In terms of wetlands and stream bank mitigation these duties are primarily exercised by four agencies: TCEQ, TPWD, TXDOT and GLO.

- TCEQ is the delegated agent of the EPA in permitting activities in streams and rivers under the Clean Water Act. This water quality permitting role gives the agency special cognizance in the mitigation of stream banks, and requires that it work closely with USACE Districts in overseeing mitigation in wetlands and the Waters of the United States. In addition, TCEQ exercises authority over the water quality in Waters of the State of Texas, and sets the Texas Surface Water Quality Standards through a formal periodic review process. Coordination of TCEQ is required on all mitigation projects.
- As stated above, TPWD plays a major role in the management of habitat and species issues in the state. In wetland and stream bank mitigation however they only play a regulatory role in the rare cases where project impacts effect species that are listed under the laws of the State of Texas but do not appear on the federal Endangered Species Listing. However TPWD plays a role in the setting of management targets and thus mitigation thresholds through developing the State Wildlife Action Plan in

coordination with USFWS. This advises both wetland and endangered species mitigation policy. In addition, TPWD often adds its considerable technical expertise to the mitigation process through comments made to the federal oversight agency concerning specific projects.

- TXDOT is the primary implementer of major highway construction projects, and thus plays the permittee role described above in most cases. Through Memoranda of Understanding (MOU) with TPWD, TCEQ, GLO and USACE the Texas Department of Transportation takes on the responsibility of self-regulating its compliance with CWA, ESA, other federal law, and state natural resource conservation law. It also provides technical advice and consultation to other implementing agencies concerning the regulatory process and compliance.
- GLO's role as a regulator of coastal resources is in practice very similar to that of TPWD in Texas mitigation. It is the delegated agent for the National Oceanic and Atmospheric Administration's (NOAA) federal regulatory authorities through a MOU (see Federal Agencies below) but NOAA's regulatory powers are very limited. In the very rare cases when an action would not fall under federal regulatory scrutiny, GLO acts as the State's regulator, but as stated above the major implementer, TXDOT, self-regulates under a MOU. Thus GLO ultimately plays an advocacy and advisory role to other agencies in the practice of mitigation.

Federal Agencies

Just like the state agencies mentioned above, the roles of federal agencies can range from implementer, through stakeholder to regulator. The most significant implementers are those agencies who routinely undertake infrastructure construction and maintenance projects on their land holdings, such as the Department of Defense (DoD), National Park Service (NPS) and USFWS. Similarly, the most significant stakeholders tend to be those agencies that hold large tracts of land or are tasked with a role in natural resource protection, such as the U.S. Forest Service (USFS) or Natural Resources Conservation Service (NRCS.)

- USACE plays the most active regulatory role in wetland and stream bank mitigation of any federal agency in Texas. Permittees work directly with offices in the four USACE districts that serve the state (Ft. Worth, Galveston, Tulsa, and Albuquerque.) Staff in these offices process all applications and coordinate the input of all other cognizant agencies. USACE delegates part of its responsibilities in fieldwork to USFWS and to TCEQ through separate MOUs.
- The EPA Region Six office in Dallas oversees EPA's role in mitigation in Texas. As stated above, EPA's authorities under the CWA are almost

entirely delegated to TCEQ for implementation. As a result, EPA primarily plays an oversight and advisory role in mitigation.

- While not directly tasked with regulatory oversight of water resources per se, USFWS uses its authorities over species and habitats to play a major role as a watchdog for mitigation decisions in Texas. The concurrence of the agency is required in all decisions which impact a federally listed threatened or endangered species, and in practice USFWS biologists provide extensive technical assistance to many projects. See endangered species mitigation below.
- NOAA's role in water resource regulation stems from the Coastal Zone Management Act of 1972 (CZMA) and CWA and is based upon the concepts of voluntary cooperation as opposed to police powers. For instance, while the Minerals Management Service (MMS) of the Department of the Interior (DOI) issues permits for oil exploration in the Waters of the United States, NOAA plays a major role in the management and remediation of spills that result from drilling accidents, but not in assessing liability or issuing fines for those accidents, a police power reserved to the U.S. Coast Guard. Similarly, while NOAA is tasked to cooperate with EPA in implementation of CWA regulations in coastal zones, actual police power is reserved to EPA.

In terms of species regulation NOAA carries greater powers under ESA. NOAA and USFWS authorities overlap in estuarine areas, but NOAA carries exclusive powers over aquatic species in deeper waters. Because infrastructure projects rarely reach those deeper waters, for practical purposes USFWS exercises all mitigation authority in this case.

NOAA exercises its limited authorities through cooperation and coordination with federal and state agencies and with NOAA funded local coastal and estuarine programs like the Coastal Bend Bays & Estuaries Program. In Texas specifically, NOAA relies primarily on its partnership with GLO to provide input into infrastructure mitigation projects.

Roles and Responsibilities for Endangered Species Mitigation in Texas

Unlike CWA authorities that are split between USACE and EPA and delegated in various ways to state agencies, oversight of ESA and endangered species mitigation in Texas is vested firmly in one agency, the U.S. Fish and Wildlife Service. When a project impacts habitat that is either 1) not associated with the Waters of the United States, or 2) is purely upland in nature AND a species listed as either threatened or endangered on the national species listing the mitigation of that impact must be permitted by USFWS.

ESA mitigation is often more complex than CWA mitigation alone. This is because a negative impact to habitat may result in the deaths of members of a protected species, or worse the destruction of habitat critical to species reproduction. This is called a “take.”

Unlike wetland mitigation that is guided by the “no net loss” policy, species mitigation requires the creation of conditions that will result in the increase in numbers of the species over time. The judgments required to ascertain this result are often highly subjective in nature, and may vary widely between different biologists and species. As a result, species mitigation is a much more difficult proposition than wetland mitigation. Worse yet, when the mitigations are combined as in the case of a protected species whose habitat is a wetland, the scientific and regulatory complexity are multiplied exponentially.

The same categories of interests (advocates and implementers, stakeholder, and regulators) hold with species mitigation as with wetland mitigation, and their role and responsibilities are similar with the exception of the regulatory role. In cases where projects impact species which are not on the national endangered and threatened species list but are recognized by the State of Texas as “rare, threatened, or endangered” TPWD exercises very similar regulatory authority to that of USFWS, but this authority is mostly delegated through MOU.

For more information see:

www.fws.gov/endangered/permits/index.html

Key Agency Contacts

Reader beware! The following listing of contact offices with key federal and state agencies is current as of 2010, but is subject to change. Webpage information is provided, but should be confirmed by internet search as required.

USACE – Headquarters

www.usace.army.mil/CECW/Pages/cecwo_reg.aspx

Headquarters, US Army Corps of Engineers
441 G. Street, NW Washington, DC 20314-1000

Phone: Regulatory (Permits) Office 202-761-5903

USACE – Galveston District

www.swg.usace.army.mil/reg/

U.S. Army Corps of Engineers, Galveston District
Attention: CESWG-PE-R
P.O. Box 1229
Galveston, TX 77553-1229

Phone: 409-766-3982
FAX: 409-766-3931

Corpus Christi Field Office
5151 Flynn Parkway, Suite 306
Corpus Christi, Texas 78411

Phone: 361-814-5850
Fax: 361-814-5912

EPA – Headquarters

www.epa.gov/wetlandsmitigation/

Phone: 1-800-832-7828
Fax: 202-566-1736

EPA – Region 6

www.epa.gov/region6/water/ecopro/watershd/contacts.htm

EPA Region 6 Main Office
1445 Ross Avenue, Ste. 1200
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The Clean Air Act – Current Implementation and Future Initiatives

The debate about the causes and affects of climate change is an ongoing part of our national policy dialog. The ozone crisis of the 1990s gave way to concerns about sea level rise, and issues of personal freedom clash with declarations about the public good, but the fundamental facts of an increased carbon load in the air are more and more evident with each new study. The Clean Air Act made great strides in cleaning up the emissions of identifiable discreet sources of air pollution such as steel mills, but experts on both side of the issue agree that more should be done. The real question is “how?”

A system of fines and offsets for point source air pollution has been in place since the 1970s, and today works in ways very similar to in-lieu fee wetland mitigation, and to a lesser degree mitigation banking. Identifiable point sources of pollution, such as oil refineries, are given permits by EPA (through TCEQ in Texas) to emit certain levels of carbon pollutants into the air as part of normal operations. When the permitted levels are exceeded, fines are assessed and corrections are made. The funds collected from those fines are spent, often through third parties, in developing projects that offset those carbon emissions, generally through the planting of trees that will sequester carbon in the soil through natural processes.

This led through the years to development of tree farms that sell carbon sequestration credits in the same way that wetland mitigation banks work. There is also a small secondary market for the trading of those credits between owners through the Chicago Climate Exchange, though the science behind the service areas of those credits can be very debatable, given the fact of the wind. But that may change in the near future.

“Cap-and-trade” is the name given to the concept of expanding the carbon credit markets to a national scale. The idea is to be able to assign pollutant load limits to all types of pollution sources, including those that are not discreetly identifiable, and provide economic incentives for the reduction of emissions load over time. For instance, automobile and truck emissions are the largest non-point source contributors of carbon and other air pollutants in America. Since it is virtually impossible to identify how much every individual car on the road contributes to the total emissions load, vehicle manufacturers and gasoline producers and/or distributors would be assigned load limits based upon some economic factors such as market share or revenue. These limits would translate into tradable credits.

Polluters who have excess credits could sell those credits to whoever needs them. This would produce a financial incentive for auto manufacturers to decrease emissions on new model cars, or for electric utility companies to retrofit generation facilities to reduce emissions. Over time, credits would be retired and the overall national “cap” of total air pollutants would contract to a level that would be sustainable in terms of a national contribution to reducing the rate of and eventually reversing global climate change.

Why is this important in terms of transportation infrastructure impact mitigation?
For a number of reasons:

1. The capacity and quality of infrastructure projects has a direct correlation with the number of vehicles on the road and the efficiency with which they move from point to point. Fewer vehicles obviously equate to lower emissions, but increased infrastructure capacity invariably leads to an increase in the number of vehicles in an area. This increase can be partially offset by moving vehicles more quickly from point to point, but as the number of vehicles grows the efficiency of infrastructure goes down. This has a direct relation to air quality in a region.
2. Clean Air Act regulations play a major role in the decisions of infrastructure advocates and implementers, as they are held responsible for air quality in their jurisdictions and regions. Regions that fall into “nonattainment” are faced with EPA-mandated rules such as vehicle emissions testing that result in economic burdens for taxpayers, but these rules can be forestalled through planning and the inclusion of alternative transportation modes in infrastructure master plans.
3. There is a very strong movement in the scientific and resource conservation communities to identify the carbon sequestration capacities of grasses and

wetland habitat in addition to that of trees. This opens the possibility of future “credit stacking” on wetland and species mitigation sites. Credit stacking means that multiple types and amounts of credits could be produced on a given site (e.g. a wetland mitigation bank could offer not just water resource credits, but also carbon sequestration credits and possibly species credits.) This may make mitigation more economically viable and help offset other costs.

4. Future transportation and environmental legislation will almost certainly require expanded planning and inclusion of clean air criteria to an even greater degree than currently called for in transportation master plans. Planning authorities such as CCMPO can get ahead of this curve with advanced capacity planning and advocacy.

As of this writing the implementation of these concepts is mired in political controversy. Concerns over economic impacts, protection of individual freedoms, and the proper role of government in society are the fuel of that controversy. The current economic crisis and other significant national concerns such as illegal immigration sap the political will of Congress to tackle the difficult debate of the science of global climate change, the social equity of legislated solutions, and the setting of national goals. However “cap-and-trade” is a major goal of the Obama Administration that will definitely be addressed at some point before the 2012 Presidential Election.

Conclusion

Mitigation of water and species resources is a fact of life in infrastructure planning and development. As our understanding of the complex interactions of man and nature expands, so too does our capacity to identify and mitigate negative impacts on nature. This is not something that should be done just because it is the law, but because it is good public policy to ensure the long-term sustainability of where we live and work.

In today’s economic and budgetary atmosphere, the constituent jurisdictions of the Corpus Christi Metropolitan Planning Organization must do all they can to manage costs while encouraging economic development. Management of regulatory compliance and construction costs are important factors in the success of infrastructure 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.

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