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APPENDIX A

COASTAL TRAINING MARKET ANALYSIS AND NEEDS ASSESSMENT

Coastal Training Market Analysis and Needs Assessment

Mission-Aransas National Estuarine Research Reserve

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List of Acronyms

AES	Texas AgriLife Extension Service (formerly Texas Cooperative Extension)
ANWR	Aransas National Wildlife Refuge
APA	American Planning Association
CBBEP	Coastal Bend Bays and Estuaries Program
CBBF	Coastal Bend Bays Foundation
CBLT	Coastal Bend Land Trust
CCA	Coastal Conservation Association
CCPD	Coastal Community Planning and Development
CHARM	Community Health and Resource Management
CSC	Coastal Services Center (NOAA)
CTP	Coastal Training Program
GLO	Texas General Land Office
NERR	National Estuarine Research Reserve
NERRS	National Estuarine Research Reserve System
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
SWCD	Soil and Water Conservation District
TAMU	Texas A&M University
TAMUCC	Texas A&M University Corpus Christi
TCCF	Texas Community Futures Forum
TCEQ	Texas Commission on Environmental Quality (formerly Texas Natural Resource Conservation Commission)
TMDL	Total Maximum Daily Load Program
TNC	The Nature Conservancy
TPWD	Texas Parks and Wildlife Department
TSSWCB	Texas State Soil and Water Conservation Board
TWDB	Texas Water Development Board
TxDOT	Texas Department of Transportation
US	United States
USDA	United States Department of Agriculture
UTMSI	University of Texas Marine Science Institute

Executive Summary

The National Estuarine Research Reserve System (NERRS) was established in 1972 by the Coastal Zone Management Act (CZMA) to provide opportunities for long-term research, education, and interpretation of coastal and estuarine resources. Consistent with the intent of the CZMA, the NERRS formally established the Coastal Training Program (CTP) in 2001 to provide additional training opportunities to coastal decision-makers throughout the county. The NERRS is comprised of 27 reserves throughout the United States covering a variety of regions and estuarine types.

The Mission-Aransas NERR represents the newest addition to this Federal-state partnership. Located in the Mission-Aransas Estuary north of Corpus Christi, TX, the Mission-Aransas NERR is the sole representative of Texas' extensive estuarine system. Due to the variety of issues specific to each location, each NERR has significant autonomy to meet the needs dictated by their coastal environment (natural and social). As such, a planning process was essential to the establishment of a CTP for the Mission-Aransas NERR.

This planning process required two primary components – a market analysis and a needs assessment. The market analysis characterizes the existing coastal training opportunities in the area surrounding the Mission-Aransas Estuary, known as the Coastal Bend. This includes a description of the counties in the Mission-Aransas NERR, a review of entities identified as potential providers of training, and information about existing training events such as the format of the event, topics covered, target audience, and location. This information will help to avoid duplication of existing training efforts and identify partnership opportunities. The market analysis indicated that the two most common training types in the Coastal Bend are “forums or public meetings” and “technical conferences or seminars.” Furthermore, the three predominate topic areas for existing training events are water issues, wildlife and ecosystem management issues, and land use and planning issues.

While the market analysis focuses on the current supply of training opportunities, the needs assessment characterizes the demand. An electronic survey was distributed and received 108 responses (over a 50% response rate). The survey characterized logistical training preferences, as well as levels of general knowledge, work-related experience, and perceived need for training. Results from the survey indicate that training events should occur predominately in the winter months and remain as short as possible. Results also indicate that the CTP should primarily focus training events on wetland protection and management, regulatory compliance, habitat restoration, and general land planning. Additional training efforts should consider issues such as coastal zone management, water resources, environmental education, coastal erosion and accretion, wastewater management, and erosion control. High ratings of perceived need for training demonstrate the need for additional training events in the Coastal Bend.

When combined, the findings of the market analysis and needs assessment define the niche needed for additional training opportunities. This document represents an important step in the establishment of a successful CTP for the Mission-Aransas NERR and the information will be used to meet the training needs of local coastal decision-makers.

1.0 Market Analysis Summary

The mission of the National Estuarine Research Reserve System (NERRS) is to establish and manage a national system of NERR sites that is representative of the various regions and estuarine types in the United States (US) through a Federal and State partnership. These NERR sites were established to provide opportunities for long-term research, education, and interpretation. The Mission-Aransas NERR in Texas strives to accomplish this through the development and facilitation of partnerships that enhance coastal decision-making through an integrated program of research, education, and stewardship. The vision of the Mission-Aransas NERR is to develop a center of excellence to create and disseminate knowledge necessary to maintain a healthy Texas coastal zone.

This vision is consistent with the development of a Coastal Training Program (CTP). As a component of the NERRS, the Mission-Aransas NERR is developing a CTP at its site. The CTP provides up-to-date scientific information and skill-building opportunities to individuals who make decisions that affect coastal resources. Through this program, the Mission-Aransas NERR can ensure that coastal decision-makers have the knowledge and the tools that they need to address critical resource management issues. The Mission-Aransas NERR recognizes local entities that provide training and seeks to coordinate efforts with these entities to increase the amount of training available and to avoid duplicate training events.

This market analysis describes entities providing coastal training events in the region surrounding the Mission-Aransas Estuary known as the Coastal Bend. This description includes a review of the entities and describes the types of training events, the use of post-training evaluation methods, training audiences, and training locations they utilize. Additionally, this analysis identifies topics for which some level of training already exists as well as topics where there is no known training effort.

Results from this document suggests that the Aransas County AgriLife Extension Service, Texas A&M University Corpus Christi, City of Rockport, Coastal Bend Bays Foundation, Coastal Bend Bays and Estuaries Program, Texas Parks and Wildlife Department, and Fennessey Ranch would each be potential members of the CTP advisory committee.

This assessment also determined that the two most common training types in the Coastal Bend are “forums or public meetings” and “technical conferences or seminars.” This suggests that these training types meet the needs of local decision-makers, but the Mission-Aransas NERR should consider providing alternative types as well. Furthermore, this document finds three general topic areas for existing training events: water issues, wildlife and ecosystem management issues, and land use and planning issues. Identification of entities providing training in these topic areas will inform partnership decisions for the Mission-Aransas NERR CTP when planning training events. In general, the findings of this document suggest that the training market is not saturated and the Mission-Aransas NERR is well positioned to have a positive impact on coastal training through both staff dedicated to providing coastal training and by developing key partnerships with existing entities in the Coastal Bend.

1.1 Introduction

The National Estuarine Research Reserve System (NERRS) formally established the Coastal Training Program (CTP) in 2001 with the purpose to provide up-to-date scientific information and skill-building opportunities to individuals who make decisions that affect coastal resources. Through this program, NERR sites can ensure that coastal decision-makers possess the knowledge and tools they need to address critical resource management issues. For the purposes of this document, the term coastal decision-maker will include any individual who makes regular decisions that impact the coastal or estuarine environments, either directly or indirectly, through their professional or volunteer activities.

The Mission-Aransas NERR is developing a CTP and this market analysis will inform the program about the current training market. Specific demographic information regarding the surrounding areas are crucial components to the understanding of the current training market. This knowledge will ensure that efforts to develop a CTP at the Mission-Aransas NERR are consistent with the mission of the NERRS and identify future direction of CTP development. Program development recognizes local entities that provide training and seek to coordinate efforts with these entities in order to increase the amount of available training and to avoid duplicate training events.

1.2 Regional Community Characteristics

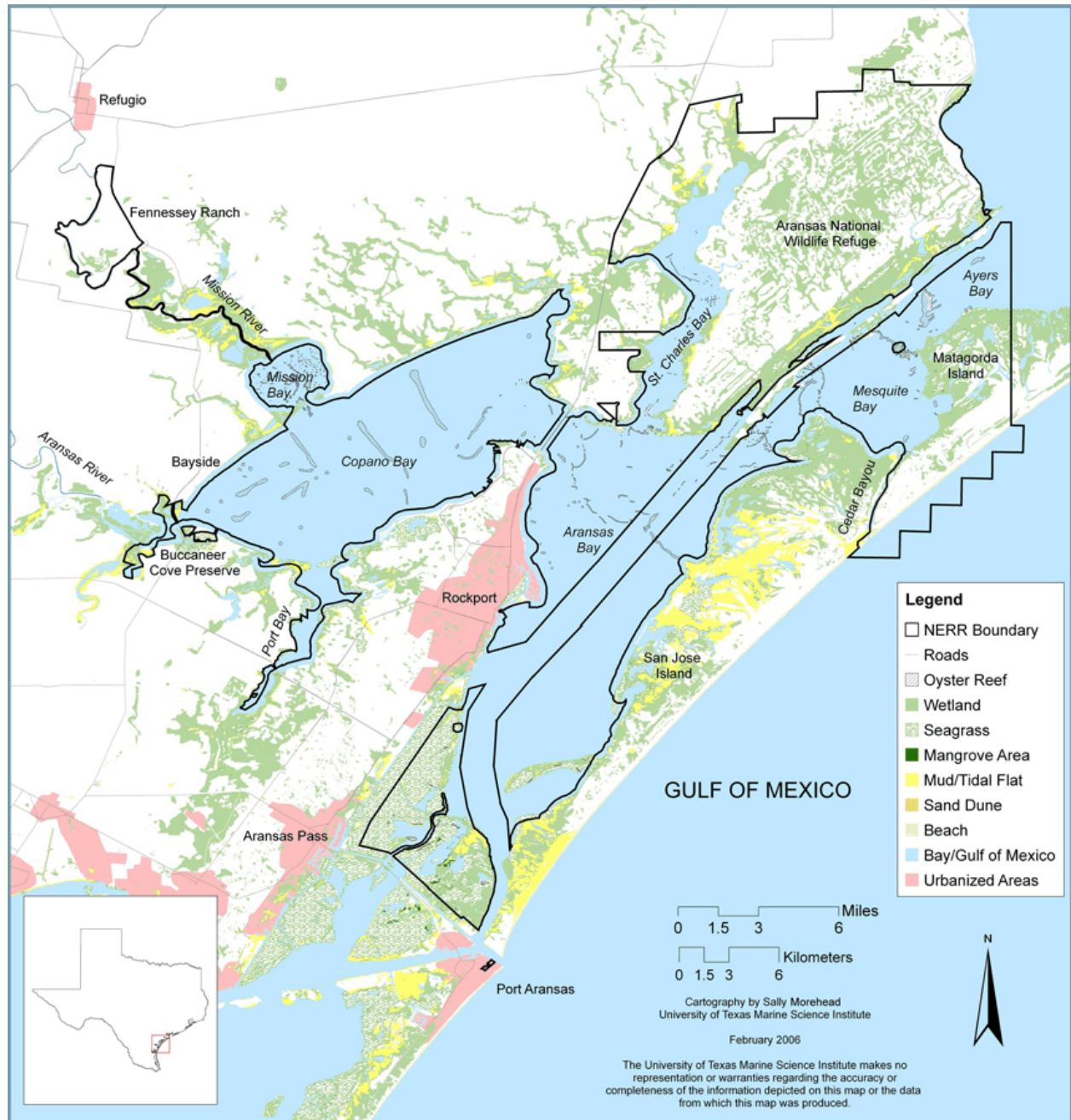
The Mission-Aransas NERR is developing a CTP to provide training events to individuals along the Texas coast. This document is the first step in characterizing the local market and defining the niche of the CTP. Aside from analyzing other agencies that are conducting training events, it is also important to recognize the local community characteristics of the region.

The Mission-Aransas NERR is the newest of the 27 sites in the United States (US) and is the only NERR in the Western Gulf of Mexico. The Mission-Aransas NERR is located 30 miles northeast of Corpus Christi, Texas in the Mission-Aransas Estuary. The Mission-Aransas NERR (185,708 acres/ 290 sq. mi./ 751.5 sq. km.) consists of a combination of approximately 115,138 acres of state-owned coastal habitat, including estuarine intertidal marsh, shallow open-water bottoms, and approximately 66,216 acres of estuarine marsh and non-tidal coastal plain habitat that is part of the Aransas National Wildlife Refuge (ANWR) (Figure 1). The site also encompasses Buccaneer Ranch Cove Preserve (728 acres), Fennessey Ranch (3,324 acres), and Goose Island State Park (271 acres). The Mission-Aransas NERR includes a diverse suite of estuarine and non-estuarine habitats that form major representative parts of a coastal watershed. The boundaries also include a number of archaeological sites (i.e., Indian middens) and significant faunal and floral components. The lands within the Mission-Aransas NERR are relatively rural with limited industrial and urban impacts. Portions of the Mission-Aransas NERR surround the rights-of-way of the Gulf Intracoastal Waterway and cabins leased by the Texas General Land Office (GLO) but these features are not included in the boundary.

The Mission-Aransas NERR spans five different counties: Aransas, Refugio, Calhoun, Nueces, and San Patricio. These counties represent a variety of different social characteristics, habitats, and environmental issues and concerns. An understanding of these differences is essential to the

development of a successful CTP for two reasons. First, this knowledge will allow for a more complete understanding of the motivations and needs of local coastal-decision makers. Secondly, this information will allow for the CTP to tailor events to meet the specific training needs in regard to both content and logistics, such as location.

Figure 1. Mission-Aransas NERR boundary and habitats.



Aransas County

The majority of the Mission-Aransas NERR (139,311 acres, 75%) lies within Aransas County. With an estimated population of 24,721 in July 2007, Aransas County encompasses the City of Rockport, the biggest population center in the area, and the Town of Fulton. An important portion of the economy in Aransas County depends on tourism and future development is predicted to impact the area.

When compared with surrounding counties, Aransas County has the highest percentage of both bare lands and developed lands. Most bare lands in this area are delineated as bay shoreline beaches, facilitating the significant tourism focus in the county and extensive urban development. Aransas County and the City of Rockport also mutually agree upon a local governmental representative, who serves as part of the Reserve Advisory Board for the Mission-Aransas NERR, to ensure public input from the area in management efforts. Further information regarding Aransas County is available on the internet at <http://www.aransascounty.org/> or www.census.gov.

Refugio County

With an estimated population of 7,358 in 2007, Refugio County has the second largest percentage of area in the Mission-Aransas NERR and includes the towns of Refugio, Woodsboro, Bayside, and Austwell. Interestingly, Refugio County is the only county in the Mission-Aransas NERR with a population that has declined since the last US Census; in 2000, the population was 7,828. The Mission-Aransas NERR holds a conservation easement on Fennessey Ranch in Refugio County. This location currently serves as a reference site for the study of surface water and groundwater interactions.

Refugio County has the most rural land use of the five counties in the Mission-Aransas NERR, with the majority of the land used for agriculture or ranching. Limited urban development in the county is centered around the towns mentioned above. Proposals for large groundwater exports pose a serious threat to Refugio County groundwater reserves and fragmentation by subdivision is an additional threat to Refugio and the Mission River watershed. Further information regarding Refugio County is available on the internet at <http://www.co.refugio.tx.us> or www.census.gov.

Calhoun County

Calhoun County represents the third largest percentage of area in the Mission-Aransas NERR with all of the included area occurring within the ANWR. The total estimated population in Calhoun County is 20,352 as of July 2007, and Calhoun County includes the town of Port Lavaca. Further information regarding Calhoun County is available on the internet at <http://www.portlavacainfo.com/> or www.census.gov.

Nueces County

Nueces County contains an estimated population of 321,135 according to July 2007 estimates. The City of Corpus Christi, with a population of over 250,000, is the largest city in both this county and the area surrounding the Mission-Aransas NERR. As a result, the Nueces Estuary generally has more anthropogenic activities than the Mission-Aransas or Baffin Bay-Laguna Madre Estuary (Montagna *et al.* 1998). The Port of Corpus Christi is the sixth largest port in the US, making marine transportation a dominant industry in the area. The Port of Corpus Christi houses several facilities, including liquid bulk docks, cargo terminals, Rincon Industrial Park, Ortiz Center, and a cold storage terminal.

In addition to Corpus Christi, the City of Port Aransas lies in Nueces County. The University of Texas Marine Science Institute (UTMSI), which administers the Mission-Aransas NERR, is located in Port Aransas. All ship traffic headed toward the Port of Corpus Christi passes through the Aransas Pass ship channel, adjacent to the northern side of Port Aransas and UTMSI and just south of the designated boundaries for the Mission-Aransas NERR. Further information regarding Nueces County is available on the internet at <http://www.co.nueces.tx.us/> or www.census.gov.

San Patricio County

San Patricio County encompasses a very small portion of the Mission-Aransas NERR including Buccaneer Cove Preserve and the southern tip of Port Bay. The US Census estimates the population of the county at approximately 68,520 as of July 2007. San Patricio County includes cities and towns such as Gregory, Ingleside on the Bay, Lake City, Lakeside, Mathis, Odem, Sinton, Taft and parts of Corpus Christi, Aransas Pass, Ingleside, Portland, and San Patricio.

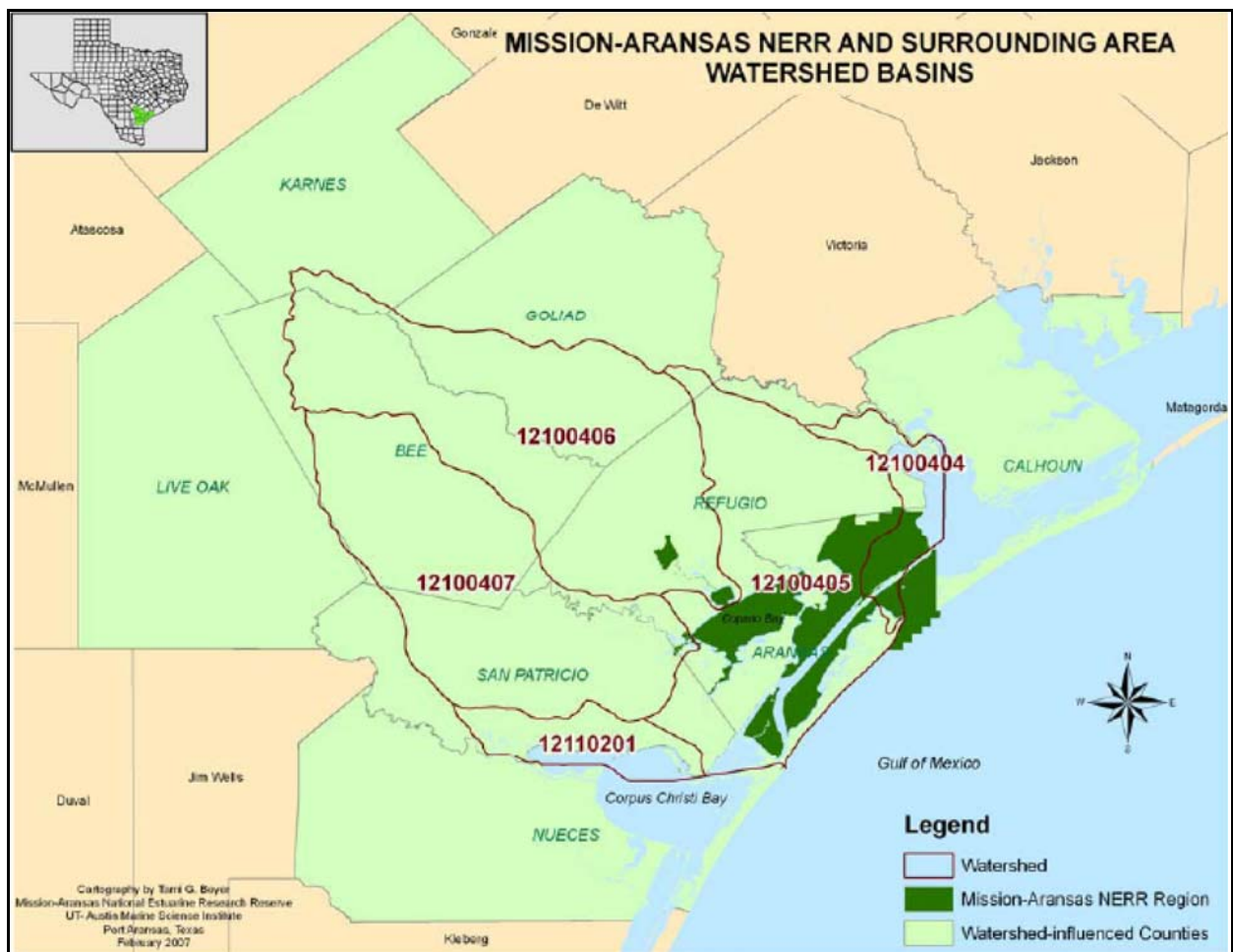
Of the counties in the Mission-Aransas NERR, San Patricio has the highest percentage of cultivated lands. The Aransas River watershed includes Chiltipin Creek and other unnamed tributaries that drain approximately two-thirds of San Patricio County, including the cities of Sinton, Odem, and Taft. This drainage includes more than 250,000 acres of intensely managed cotton and grain sorghum row crop farms. Much of the Aransas River watershed lies within the land holdings of the Welder Wildlife Foundation (7,800 acres), whose primary purpose is wildlife management and conservation. Further information regarding San Patricio County is available on the internet at <http://www.co.san-patricio.tx.us/> or www.census.gov.

Other Counties within Mission-Aransas NERR Watershed

In a broader sense, a total of nine different counties influence the Mission-Aransas NERR due to the extent of the watershed (Figure 2). Thus, in addition to the efforts devoted to coastal training for decision-makers within the boundaries of the Mission-Aransas NERR, additional effort must focus on the overall impacts of the watershed to achieve the maximum effect of any training effort dealing with water or water quality. While the primary focus of the training effort will involve local counties, efforts may be expanded to include other counties in the watershed. These counties include, Karnes County with an estimated population of 15,067 in July 2007, Goliad County with an estimated population of 7,154 in July 2007, Bee County with an estimated population of 32,689 in July 2007, and Live Oak County with an estimated population of 11,349 in July 2007. Further information regarding these counties is available on the internet through the US Census Bureau at www.census.gov or through their county website as follows:

- Karnes County <http://www.co.karnes.tx.us/>
- Goliad County <http://co.goliad.tx.us/>
- Bee County <http://www.co.bee.tx.us/>
- Live Oak County <http://www.co.live-oak.tx.us/>

Figure 2. County boundaries in the Mission-Aransas NERR and adjacent watersheds.



1.3 Methods

This document identifies agencies that provide training and characterizes the types of training events, audiences, evaluation methods, and training locations for those agencies identified. Preparation of this document implemented a variety of different techniques in order to identify and evaluate providers of coastal training in the areas surrounding the Mission-Aransas NERR. As a first step, CTP market analyses from other NERR sites were reviewed to provide a general framework of the types of entities that one might observe in any coastal community. This general knowledge was then used to help identify the specific entities involved in training in the Coastal Bend. Recipients of the Final Programmatic Environmental Impact Statement were also considered to help identify other providers of coastal training in the area (US Department of Commerce 2006).

The result of these combined efforts was an evaluation of numerous entities for existing training activities. After an entity was identified as a potential provider of coastal training, phone interviews and internet research were conducted to characterize their coastal training efforts. This information was used to identify topics for which some level of training already exists as well as topics where there is no known training effort. The document is also supplemented by responses to questions included within the Mission-Aransas NERR needs assessment survey that was distributed to coastal decision-makers in the Spring of 2008. These responses provided additional information regarding the types of services provided by coastal decision-makers and the frequency of events for those entities that reported providing training. Additionally, survey responses helped characterize the impacts of partnership on the training market in the Coastal Bend.

1.4 Coastal Training Provider Information

This report includes a synopsis of agencies that provide coastal training to local decision-makers. The entities identified provide a broad range of training events with several entities clearly providing resources that meet the description of coastal decision-maker training. Other entities provide some combination between training and education at various levels including a few entities that provide almost entirely educational or outreach events. In addition to identifying the coastal training capabilities of each entity, this section also reports brief descriptions of the training events offered, the use of performance measures or post-training evaluations, typical audiences, and training locations. This information will inform the program development of the Mission-Aransas NERR CTP and will also be used to help form a CTP advisory committee for the Mission-Aransas NERR.

Interaction with partners is a key for success and provides the Mission-Aransas NERR with access to a wider pool of information and resources. The Mission-Aransas NERR works with a variety of partners; nine entities make up a Reserve Advisory Board which provides advice to the management of the Mission-Aransas NERR. These partners include federal and state agencies as well as private land owners: US Fish and Wildlife Service, Texas General Land Office (GLO), Texas Parks and Wildlife Department (TPWD), Coastal Bend Land Trust (CBLT), the Coastal Bend Bays & Estuaries Program (CBBEP), The Nature Conservancy, the Fennessey Ranch, the Texas Department of Transportation (TxDOT), and a local representative

mutually agreed upon by the City of Rockport and Aransas County. The Mission-Aransas NERR CTP will not only work closely with the members of the Reserve Advisory Board but will also work with a wide variety of additional organizations.

Coastal Bend Bays & Estuaries Program

The Coastal Bend Bays & Estuaries Program is a local non-profit entity established in 1999 and is a member of the Reserve Advisory Board for the Mission-Aransas NERR. The CBBEP project area encompasses 12 counties of the Coastal Bend Council of Governments extending from the land-cut in the Laguna Madre, through the Corpus Christi Bay system, and north to the ANWR. The mission of the CBBEP is to protect and restore the health and productivity of the bays and estuaries while supporting the continued economic growth and public use of these environments.

The CBBEP operates as a non-regulatory, voluntary partnership effort with industry, environmental groups, bay users, local governments, and resource managers to improve the health of the local bay systems. A mix of local governments, private industry, state, and federal agencies provide program funding. CBBEP also seeks private grants and additional governmental funding.

The CBBEP now operates the CBLT which is also a member of the Reserve Advisory Board for the Mission-Aransas NERR. The CBLT preserves and enhances native wildlife habitat through ownership and management of private lands. It buys land outright at appraised value, buys it at a discounted value with a partial donation, accepts donations of land and buys or accepts donations of conservation easements. Funding for land acquisition and management is raised through a partial donation of the tax savings created by easement transactions, as well as through grants and gifts from individuals, businesses, charitable foundations, and governmental agencies. Further information regarding CBLT can be found on the internet at <http://www.coastalbendlandtrust.org/>.

The CBBEP provides outreach events in the Coastal Bend; however, these events are more directly related to educational outreach. Specifically, CBBEP hosts the "Learning on the Edge" teacher training that takes teachers into the Nueces Delta Preserve and teaches them field education skills. Additionally, the CBBEP assists in training in the Coastal Bend by providing resources and funding support for a variety of activities including training events. This support makes the CBBEP a good candidate for the Mission-Aransas NERR CTP advisory committee. The CBBEP has a 30-person conference room that is primarily used for interoffice meetings, but may be available for training events targeted at the CBBEP staff (Table 1). Further information regarding the CBBEP can be found on the internet at <http://www.cbbep.org/index.html>.

Coastal Bend Bays Foundation

The Coastal Bend Bays Foundation (CBBF) is a public interest organization dedicated to the conservation of freshwater and coastal natural resources through communication, advocacy, research, and education. Its membership is comprised of representatives of environmental groups, fishing organizations, port industries, government agencies, university scientists, and concerned citizens. This broad-based membership helps the CBBF to bring diverse interests

together in order to achieve community environmental and economic objectives. The CBBF hosts technical seminars in the Coastal Bend focusing on a variety of issues including healthy fisheries, heavy metals, and endangered species protection. The CBBF hosts monthly forums at Texas A&M University Corpus Christi and has hosted seminars on a variety of topics including water issues, Gulf of Mexico biodiversity, and mechanisms for seagrass growth which typically last for 1-2 hours (Tables 1, 2, and 3). In addition to these regular events, the CBBF advertises events for other entities such as the UTMSI Technical Seminars and Public Lecture Series, the Coastal Bend Audubon Society events, and the Surfrider Foundation events. The CBBF also sponsors events such as Earth Day-Bay Day that focus more on outreach and education rather than directly training coastal decision-makers. Nevertheless, the CBBF would be a good candidate for the Mission-Aransas NERR CTP advisory committee. Further information regarding the CBBF can be found on the internet at <http://www.baysfoundation.org/>.

Fennessey Ranch

The Fennessey Ranch is a member of the Reserve Advisory Board and is part of a 750,000 acre Texas land holding that has remained in the same family for 171 years. The ranch consists of 3,324 acres of abundant wetlands, meadows, natural lakes, riparian woods and brush land, and 14 artesian wells. The Mission-Aransas NERR and the University of Texas own a conservation easement on the Fennessey Ranch which restricts development and habitat fragmentation. Located in the heart of the migratory bird Central Flyway, Fennessey Ranch has nine miles of river front property, 500 acres of wetlands and natural lakes, and is located within the jurisdiction of the Refugio Groundwater Conservation District.

Fennessey Ranch operates a wide array of unique research and recreational programs. Fennessey Ranch is currently designed to be an environmentally sound as well as economically viable business. Its current economic base incorporates hunting, wildlife tours, photography tours, remnant oil and gas development, and cattle enterprises (Croft and Smith 1998). While Fennessey Ranch represents an important educational tool and venue for future training, the existing outreach efforts do not directly address coastal training, although some training of coastal decision-makers occurs indirectly (Table 2). Further information regarding Fennessey Ranch can be found on the internet at <http://www.fennesseyranch.com/>.

National Oceanographic and Atmospheric Administration Coastal Services Center

The National Oceanic and Atmospheric Administration Coastal Services Center (CSC) provides resources and expertise for coastal training workshops. The CSC partners with the NERRS throughout the US to provide a wide variety of workshops to coastal decision-makers. The partnership works well as the NERR provides the facilities, circulates invitations, and addresses logistical issues, while the CSC provides training, materials, and expertise to ensure that events will be locally relevant and as beneficial as possible to the target audience.

Training events cover a variety of subject matter including Coastal Community Planning and Development (CCPD), Coastal Inundation and Mapping, and a series of tools involving Geographic Information Systems (Table 2). Each training run by the CSC involves a different number of participants, depending on the topic. All training efforts incorporate a short

post-training survey that is usually distributed at the end of the training during a time allotted for attendees to respond. The Mission-Aransas NERR has worked with CSC to host coastal decision-maker workshops in the past and will continue to strengthen the partnership. Further information regarding the NOAA CSC is available on the internet at <http://www.csc.noaa.gov/>.

Natural Resources Conservation Service

The National Resources Conservation Service (NRCS) is an agency of the federal government, and is operated under the US Department of Agriculture (USDA). The primary task of this agency is to assist land owners such as farmers or ranchers on land conservation issues. While neither training nor coastal issues rank among the primary tasks of the NRCS, the group provides training for the local Copano Bay Soil and Water Conservation District Board. These training events typically occur over several days and primarily focus on issues directly related to agriculture, but also include informational training on riparian buffers, water quality, and conservation (Table 2).

The training events offered by the NRCS draw attendees from land owner groups, including farmers and ranchers. These training events are dominated by classroom activities such as lecture, discussion, and question/answer. The NRCS follows their training events with two methods of post-training evaluation. The first method is a quiz administered at the end of each day of a training. This quiz is intended to explore the level of retention and comprehension of the material presented in the training section. The second method of post-training evaluation is a questionnaire which asks attendees to comment more about what they liked or did not like about the form and function of the training session. Further information regarding the NRCS can be found on the internet at <http://www.nrcs.usda.gov/>.

Rockport Water Quality Committee

The Rockport Water Quality Committee is a recently formed committee in Rockport, Texas that organizes presentations by experts in various scientific fields such as water quality testing, seagrasses, and bird life. The purpose of the monthly workshops is to allow the members of the committee to increase their knowledge regarding water quality throughout the surrounding area and to inform recommendations they make to the Rockport City Council. Through this effort, the Rockport Water Quality Committee provides a form of coastal training that the Mission-Aransas NERR CTP can support and partner with to create more in-depth training events. This committee typically hosts monthly workshops at the Rockport City Hall with a capacity of 50 people (Table 1). The City of Rockport and Town of Fulton also have many other venues available for training events (Table 1). Further information regarding the Rockport Water Quality Committee can be found on the internet at <http://www.cityofrockport.com/index.asp?NID=69>.

Texas A&M University Corpus Christi

Texas A&M University Corpus Christi (TAMUCC) provides training events to decision-makers in the Coastal Bend. The TAMUCC Center for Coastal Studies is involved with training Texas Master Naturalists and hosts a semi-annual training, focused on riparian ecology, at Fennessey Ranch. This training typically draws approximately ten attendees who spend the morning in the

classroom, learning key concepts and definitions, and then spend the afternoon learning sampling techniques in the field and discussing possible scenarios they might adopt for the individual projects that are a required part of the program. The Master Naturalists then take this knowledge and return to their local communities where they often work with local conservation groups and governmental officials to apply their considerable knowledge.

Other training events provided by TAMUCC rely on grant funding and can vary widely in topic. These coastal training events typically attract about 25 people from relevant sectors such as experts on local water quality and elected officials. Presently, the TAMUCC Center for Coastal Studies has applied for a grant from the USDA to offer water quality training in the Coastal Bend. Specifically, this grant would be used to develop a conceptual model of water quality issues and explore how to develop potential management alternatives. The aim of this training is to bring national experts to the area to train local resource managers. This series of workshops will likely partner with the Mission-Aransas NERR and involve one event in Port Aransas at the UTMSI, one event in Rockport, and one event in either Refugio or Sinton. Further information regarding TAMUCC is available on the internet at <http://www.sci.tamucc.edu/>.

Texas AgriLife Extension Service

The Texas AgriLife Extension Service (AES) (previously known as the Texas Cooperative Extension) works with its Texas A&M System partners, the state legislature, and the communities it serves, to provide Texans with community-based education. The AES provides numerous training activities through a network of 250 county Extension offices, 616 Extension agents, and 343 subject-matter specialists. With locally based staff, the AES strives to provide unbiased, research-based information, educational programs, and technical assistance throughout the Coastal Bend in the local areas of expertise such as agriculture and natural resources, family and consumer sciences, 4-H and youth development, horticulture, integrated pest management, and marine resources.

The training efforts of the AES office in Aransas County include a variety of forums, events, or workshops intended to educate local leaders, elected officials, and citizens (Table 2). One of the more recent events that the AES has hosted was the Texas Community Futures Forum (TCFF). The TCFF elicited input from county residents on what they perceived to be the most important issues affecting the county. This input helped them to tailor programs to better assist local citizens. Population growth was one of the most prominent issues, with many of the comments centering around the need to keep Aransas County's unique "coastal charm." The Aransas County AES office offered a series of workshops on population growth issues in 2005 and 2006 and formed a stakeholder committee to guide the development of a program of workshops designed to inform decision-makers and local citizens about the impact of different growth alternatives.

In 2006, AES received a grant from the GLO under the Coastal Management Program to aid this effort, and was titled Coastal Community Health and Resource Management (CHARM). The CHARM project administered a quality of life survey to help guide policy makers and design future educational programs. The survey was administered at several meetings or public events in 2006 and 2007 and was answered by both residents and vacationers. Results from the survey

were discussed in public meetings and discussion forums, where agents of the AES presented the findings to local governmental officials and the general public. As a follow-up, the Aransas County AES hosted a series of public meetings entitled “Conversations About Growth.”

In addition to these efforts, the Aransas County AES office supports the Rockport/Fulton Area Chamber of Commerce by providing speakers for luncheons and participating when needed. This arrangement allows the AES to utilize these luncheons as a means of training coastal decision-makers. The Aransas County AES also hosts and co-hosts a variety of training events regarding smart growth, rainwater harvesting, native plants, and ecotourism, among others. In addition, the AES provides and coordinates the training for the local Master Naturalists and Master Gardeners. Master Naturalists must receive 40 hours of classroom and field instruction in addition to completing 40 hours of volunteer service and eight hours of continuing education. Similarly, Master Gardeners must receive 50 hours of classroom training and perform 50 hours of volunteer service in addition to completing six hours of continuing education.

The Aransas County AES office will likely be a primary partner for CTP efforts, but other surrounding County AES offices, such as Nueces, Refugio and San Patricio, will also partner in training events. Many of the other county offices are also conducting decision-maker training events for the TCCF and are involved in the training of local Master Naturalists and Master Gardeners. While some activities remain the same for AES offices, each county office focuses on a set of issues that best serves the needs of its community. The Refugio County AES office focuses on agricultural issues, 4-H and youth development, and quality of life issues. The Calhoun County AES office focuses primarily on issues of integrated pest management and the Farm Bill. The Nueces County AES office focuses on issues relating to quality of life such as community health, and agricultural issues including 4-H activities, horticulture, gardening, and urban pest management. In comparison, the San Patricio County AES office deals with both of the agricultural and quality of life issues common across the various counties but also addresses issues of rangeland management and integrated pest management. While the Aransas County AES office is likely the best fit as a member of the Mission-Aransas NERR CTP advisory council, partnerships between the Mission-Aransas NERR and other AES county offices remain a valuable option for the CTP when hosting events that address issues related to agriculture and the coastal and estuarine environments. Further information regarding the AES can be found on the internet at <http://texasextension.tamu.edu/> or <http://aransas-tx.tamu.edu/>.

Texas Chapter of the American Planning Association

The American Planning Association (APA) is a nonprofit public interest and research organization representing over 39,000 practicing planners, officials, and citizens involved with urban and rural planning issues. The mission of the Texas Chapter of the APA is to advocate the profession of planning, providing expertise and processes that empower citizens to be engaged in the development and sustainability of communities in Texas.

The Texas Chapter of the APA held its ninth annual series of training sessions for planning commissioners and elected officials during the months of April through August in 2007 (Table 2). The training was staffed by professional planners and the sessions were coordinated with the

Texas Association of Regional Councils, local Council of Government offices, and Regional Sections of the Texas Chapter. The course titles for this training series included the following:

- Texas Planning – What You Need to Know in 2007
- Being an Effective and Ethical Planning Commissioner: Roles, Responsibilities, Ethics and Legal Responsibilities
- A Comprehensive Plan That Works
- Learn By Doing – An Exercise In Decision Making
- Introduction to Zoning
- Use of Planned Development districts
- The Board of Adjustment
- Legislative and Court Activity

These sessions provide an opportunity for appointed and elected officials in the Mission-Aransas NERR watershed to become better informed of their duties and responsibilities. The APA is the primary entity that local land use planners utilize and the CTP should involve them in training events that relate to land use. Further information regarding the APA can be found on the internet at <http://www.txplanning.org/>.

Texas Commission on Environmental Quality

Texas Commission for Environmental Quality (TCEQ) does not directly pursue the training of coastal decision-makers; however, TCEQ does fund the Texas Stream Team that is administered through Texas State University. The Texas Stream Team (formerly know as Texas Watch) is a water quality sampling program that provides sampling protocols, coordinates sampling efforts, and trains volunteer samplers (Table 2). This program also reviews and analyzes data for various water quality parameters, including bacterial counts. Training events hosted under the Texas Stream Team program typically attract local citizens and government representatives interested in water quality and public health issues. Further information regarding the TCEQ can be found on the internet at <http://www.tceq.state.tx.us/>.

In addition to supporting the Texas Stream Team, TCEQ does support one avenue of coastal training that addresses total maximum daily loads (TMDL). A TMDL exists for Copano Bay, the tidal portion of the Mission River, and the tidal portion of the Aransas River. The goal of the TMDL is to reduce bacteria concentrations to levels that will make it safe to harvest and eat shellfish from the bay. As a result of the TMDL, TCEQ has hosted several public meetings designed to share information about the TMDL process and gather feedback from stakeholders (Table 2). Previous TMDL meetings disseminated technical information regarding bacteria source tracking efforts and sampling of waste water treatment plants. Feedback from attendees was requested through a survey distributed at the public meetings and contact information was provided to receive feedback from attendees at a later time. Further information on the Texas Stream Team can be found on the internet at <http://texaswatch.rivers.txstate.edu/>, and further information regarding Texas State University can be found on the internet at <http://www.txstate.edu/>.

Texas Department of Transportation

The Texas Department of Transportation, in cooperation with local and regional officials, is responsible for planning, designing, building, operating, and maintaining the State's transportation system. TxDOT maintains the Copano Causeway and the state highways that are adjacent to the Mission-Aransas NERR and is a member of the Reserve Advisory Board. TxDOT, acting through the Texas Transportation Commission, is also the nonfederal sponsor for the Gulf Intracoastal Waterway. As the nonfederal sponsor, the TxDOT coordinates local management efforts with the US Army Corps of Engineers. Coordination by TxDOT is run out of the Gulf Intracoastal Waterway Office in the Transportation Planning & Programming Division.

The Texas Department of Transportation (TxDOT) provides regular annual and semi-annual training events (Table 2). These training events are often co-sponsored by the Texas Transportation Initiative which is a research department with Texas A&M University College Station. These training events are interrelated and cover topics such as ports and waterways, environmental affairs for highway sites, surveying and planning, and maintenance of the transportation system. These training efforts seek to reach public officials and TxDOT staff, vendors, and customers. Further information regarding TxDOT can be found on the internet at <http://www.dot.state.tx.us/>.

Texas General Land Office

The Texas General Land Office (GLO) is responsible for the management of state lands and mineral-right properties and is a member of the Reserve Advisory Board for the Mission-Aransas NERR. Included in the management responsibility of the GLO are Texas beaches, bays, estuaries and other "submerged" lands out to 10.3 miles in the Gulf of Mexico. In managing this land, the GLO leases drilling rights for oil and gas production on state lands, producing revenue and royalties for the State's Permanent School Fund.

Coastal training is not a primary goal of the GLO, but the GLO has hosted and participated in numerous educational events for citizens throughout Texas, although many of these have not directly targeted coastal decision-makers (Table 2). The GLO does, however, host several types of conferences that draw the attendance of coastal decision-makers. The GLO hosts technical conferences featuring topics such as beach nourishment, wetland and habitat restoration, shoreline change, sea level rise, and coastal hazards, among others. Such a conference might draw 300 to 400 attendees ranging from local to international. These technical conferences take the form of a speaker and presentation, which is followed by a question and answer session and a discussion.

In addition to hosting technical conferences, the GLO hosts public issues forums that are non-technical and accommodate a much wider audience. Recently, the GLO partnered with the American Shore and Beach Foundation to host a public issues forum in Galveston, Texas. This forum focused on as many as 25 different coastal issues ranging from beach nourishment and erosion to activities such as surfing. A public issues conference could draw between 1,000 and 2,000 attendees. The public issues forum utilizes discussion tables with each table being

assigned a topic for discussion and the attendees rotating to discuss different topics with different people.

The GLO frequently uses SurveyMonkey® for their post-training evaluations (www.surveymonkey.com). SurveyMonkey® is an electronic survey tool that offers a variety of question types so users can customize any survey to meet their specific needs. The goal of these surveys is to check retention and comprehension of information among the attendees as well as to evaluate the logistics of the workshops such as the frequency and lengths of breaks.

While the GLO does not directly target coastal decision-makers with their conferences, they indirectly attract coastal decision-makers to their events, due to the large audiences. Additionally, the GLO is looking to get more involved in public outreach and training as they seek to fill a new marketing position. This position would increase the public involvement of the GLO throughout Texas, but will likely remain focused primarily on marketing and outreach, rather than training. Further information regarding the GLO can be found on the internet at <http://www.glo.state.tx.us/>.

Texas Parks and Wildlife Department

Texas Parks and Wildlife Department (TPWD) provides outdoor recreational opportunities and manages and conserves wildlife, wildlife habitat, and historic areas. TPWD is a member of the Reserve Advisory Board for the Mission-Aransas NERR and manages several areas in the Mission-Aransas NERR including Goose Island State Park and the Redfish Bay State Scientific Area. Goose Island State Park is located north of Rockport in Aransas County and consists of 321.4 acres of oak mottes, coastal prairie, and wetlands that are bounded by the St. Charles Bay and Aransas Bay. The Redfish Bay State Scientific Area contains 50 square miles (32,000 acres) of prime fishing habitat and includes 14,000 acres of submerged seagrass beds. Redfish Bay contains the northernmost extensive stands of seagrass on the Texas coast. As such, Redfish Bay was designated as a state scientific area by the Texas Parks and Wildlife Commission for the purposes of protecting and studying the native seagrasses.

Training of coastal decision-makers is not the primary responsibility of the TPWD; however, the efforts of this agency do involve some coastal training capabilities. For instance, in 2006, TPWD developed and implemented a seagrass protection regulation for Redfish Bay State Scientific Area. In developing and implementing this regulation, TPWD communicated with and educated local governments at the city and county level, Chamber of Commerce members, and stakeholder groups such as the Coastal Conservation Association.

The training events hosted by TPWD often take the form of a public meeting with an informational presentation followed by discussion to allow for comprehension, understanding, and input from the attendees regarding the release of a new regulation. This training enables decision-makers to understand how a regulation affects their constituents and assists them in pursuing informed public policies. Further information regarding TPWD can be found on the internet at <http://www.tpwd.state.tx.us/>. Additional information regarding Goose Island State Park can be found on the internet at

http://www.tpwd.state.tx.us/spdest/findadest/parks/goose_island. Further information regarding Redfish Bay State Scientific Area can be found on the internet at <http://www.tpwd.state.tx.us/landwater/water/habitats/seagrass/redfish.phtml>.

Texas State Soil and Water Conservation Board

The Texas State Soil and Water Conservation Board (TSSWCB) is the lead state agency for planning, implementing, and managing programs and practices for preventing and abating agricultural and silvicultural nonpoint sources of water pollution. The TSSWCB also coordinates the programs of the Texas' 217 soil and water conservation districts such as the Copano Bay District and administers the state brush control program. The TSSWCB maintains regional offices in strategic locations across the state to help carry out the agency's responsibilities. Additionally, the TSSWCB partners with the NRCS in order to ensure that water quality management plans meet USDA standards.

TSSWCB is also currently partnering with AES to host Texas Watershed Steward programs. The Texas Watershed Steward program is designed for those interested in water quality issues and those who may want to become more directly involved in watershed protection and management in their area. The workshops are one-day training events that address the fundamentals of watershed systems, water quality regulation and monitoring, watershed improvement methods, enhancing watershed functions, and community-driven water resource management. Each training will focus on a specific watershed but the workshop is structured so that participants from outside these targeted watersheds will be able to apply what they learn to where they live. Participants will receive a free copy of the Texas Watershed Curriculum Handbook, a certificate of completion, and continuing education units and/or credit hours for a variety of fields. Further information regarding TSSWCB can be found on the internet at <http://www.tsswcb.state.tx.us/managementprogram/txwsp>.

Texas Water Development Board

The Texas Water Development Board (TWDB) provides water planning, data collection and dissemination, and financial and technical assistance services to the citizens of Texas. The mission of the TWDB is to provide leadership, planning, financial assistance, information, and education for the conservation and responsible development of water for Texas. While the TWDB does not hold formal training events for decision-makers, they collect data and hold meetings for regional water planning groups. While some information is likely to reach decision-makers through this process, the primary aim is to present information, rather than to provide training. The TWDB is a good resource for identifying coastal decision-makers that may be interested in water issues. Further information regarding TWDB can be found on the internet at <http://www.twdb.state.tx.us/home/index.asp>.

Welder Wildlife Foundation

The Rob and Bessie Welder Wildlife Foundation, established in 1954, is a non-profit, 501(c)(3) foundation. The Welder Wildlife Foundation headquarters and offices are located on a 7,800-acre native wildlife refuge eight miles north of Sinton, Texas, in San Patricio County. The

Welder Wildlife Foundation's research and educational priorities include wildlife management, conservation, and other closely related disciplines.

While the focus of the outreach efforts of the Welder Wildlife Foundation is education, the training of coastal decision-makers occurs indirectly. The conservation education programs target public school and university groups, and emphasize ecology and management of wildlife and its habitats. A wide array of public tours, school and college programs, teacher in-service programs, conservation workshops, scientific education programs, symposia, and field days, led by professionally trained staff, are offered throughout the year.

The Welder Wildlife Foundation offers training events featuring speakers from throughout Texas, with the majority of speakers being from the immediate region. Training events include a combination of classroom work such as lecture, question/answer, or discussion and field study such as skills practice, monitoring, and observation. The training events are often species specific and can cater to landowners interested in land conservation, nature enthusiasts, or natural scientists. In addition to focusing on individual species, topics of interest for the training events include impacts of various fire regimes, water quality, and ecology (Table 2). Training events often utilize outdoor facilities and an indoor theater style auditorium (Table 1). Further information regarding the Welder Wildlife Foundation can be found on the internet at <http://www.welderwildlife.org/>.

Table 1. Training facilities and their locations in the Coastal Bend region.

Location	Facility Name	Approx. Capacity	Contact
Paws & Taws <i>Rockport, TX</i>	Paws & Taws	100	Front desk
Rockport Beach Park <i>Rockport, TX</i>	Saltwater Pavilion; Beach Pavilion	150; 50	Tom Staley
City of Rockport <i>Rockport, TX</i>	City Hall	50	Tom Blazek
Texas Maritime Museum <i>Rockport, TX</i>	Meeting Room	30	Jennifer Rogers
Welder Wildlife Foundation <i>Sinton, TX</i>	Auditorium	50	Selma Glasscock
ANWR <i>Austwell, TX</i>	Visitor Center and outdoor venues	30	Chad Stinson
UTMSI <i>Port Aransas, TX</i>	Auditorium	150	Linda Fuiman
TAMUCC <i>Corpus Christi, TX</i>	Carlos F. Truan Natural Resources Center	150	Liz Smith
CBBEP <i>Corpus Christi, TX</i>	Conference Room	30	Jace Tunnell

Table 2. Market analysis summary table.

Entity	Title/ Topic(s)	Training Type	Training Length	Target Audience	Evaluation Method
CBBF	Water issues, biodiversity, sea grasses, and bacteria	Forum or public meeting (monthly)	Typically 1 to 2 hour events	Coastal decision-makers, students, and interested citizens	None
	Fisheries, heavy metal toxicity, and endangered species	Technical conference or seminar	Varied	Coastal decision-makers and interested citizens	None
Fennessey Ranch	Ecology, wildlife management, water quality, agriculture, etc.	Indirect training: Education or outreach events	None	Varied	N/A - education or outreach
NOAA CSC	Coastal Community Planning and Development/ smart growth	Technical conference or seminar	2 day events	Coastal decision-makers representing various sectors of the local community	Paper evaluation distributed at the end of the event
NRCS	Agricultural issues including riparian buffers, water quality and conservation.	Technical conference or seminar	Multiple day event	Copano Bay Soil and Water Conservation District Board	Survey administered at day end and a final survey administered at the end of the event. Used Survey Monkey to administer surveys.
Rockport Water Quality Committee	Issues relating to the water quality, including topics such as bacteria, bird life, and sea grasses	Technical conference or seminar	Typically 1 to 2 hour events	Members of the committee, other coastal decision-makers, and interested citizens	None
TAMUCC	Master naturalist training/riparian ecology	Fieldwork for a certification program	40 hours class 40 hours field	Naturalists training for their Master Naturalist certification	None

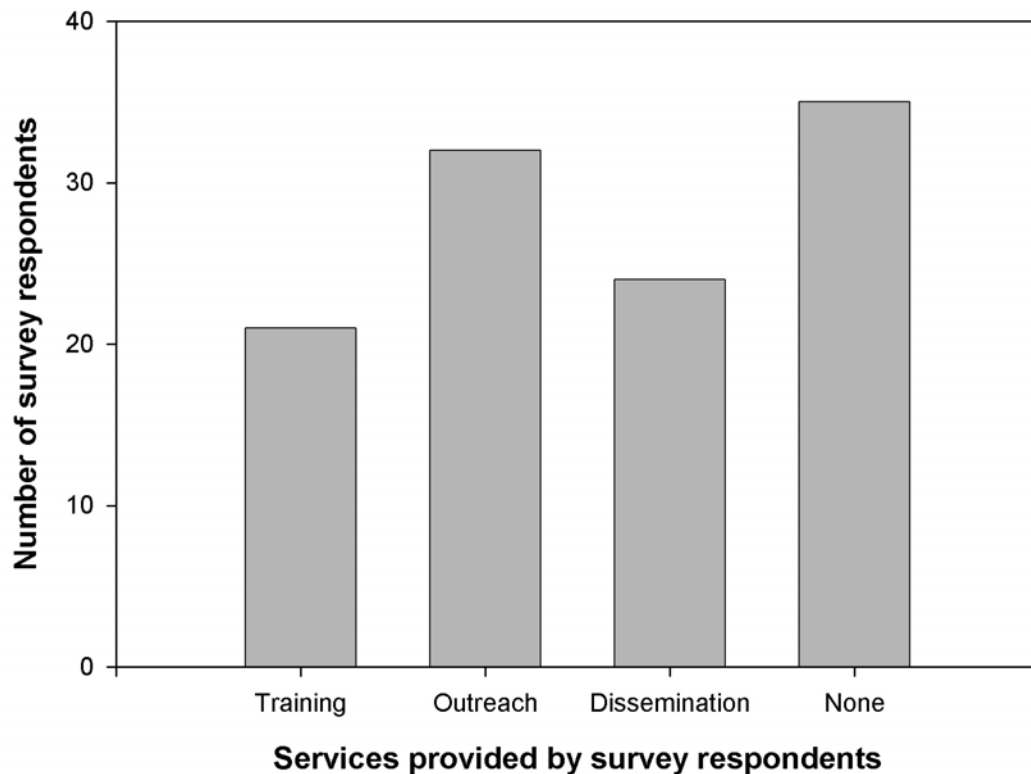
Entity	Title/ Topic(s)	Training Type	Training Length	Target Audience	Evaluation Method
	Water quality	Technical conference or seminar (grant funded)	NA	Local experts and officials	None
TAES	TCCFF/ growth, development and community preferences	Forum or public meeting	Varied	Coastal decision-makers and interested citizens	None
	Ecotourism	Luncheon	~1 hour event	Members of the Rockport/ Fulton Area Chamber of Commerce	None
	Master Gardener	Certification program	50 hours class 50 hours field 6 hours continuing education	Local gardeners	N/A - certification program
	Master Naturalist	Certification program	40 hours class 40 hours field	Local naturalists	N/A - certification program
Texas Chapter of the APA	Landuse planning, decision-making, legislation rules and regulations	Annual training event	NA	Coastal decision-makers and planning commissioners	None
Texas Stream Team	Volunteer monitor training	Volunteer monitor training	Varied	Coastal decision-makers and other citizens interested in monitoring their local water quality	Quality assurance and control measures performed on the volunteer data
TCEQ	Total Maximum Daily Load	Forum or public meeting	~3 hours	Coastal decision-makers, stakeholders, and concerned citizens	Survey collected at the close of the meeting
TxDOT	Ports and waterways, environmental affairs for highways sites, surveying, planning, and system maintenance	Technical conference or seminar	NA	TxDOT staff, vendors, customers, and other coastal decision-makers	None

Entity	Title/ Topic(s)	Training Type	Training Length	Target Audience	Evaluation Method
Texas GLO	Beach nourishment, wetland and habitat restoration, shoreline change, sea level rise, and coastal hazards	Technical conference	NA	300-400 coastal decision-makers and specialists ranging from local to international	Distributes 2 surveys: retention of information and training logistics and format
Texas GLO (continued)	25 coastal issues including beach nourishment, erosion, and surfing	Rotating issue specific discussion	NA	1000-2000 coastal decision-makers and interested citizens	Distributes 2 surveys: retention of information and training logistics and format
TPWD	Compliance and enforcement of sea grass regulations	Forum or public meeting	NA	Coastal decision-makers, stakeholders, and concerned citizens	None
TSSWCB/AES	Texas Watershed Steward Program/ water quality	Technical conference or seminar; certification program	1 day events	Decision-makers dealing with water resources	None
TWDB	Development and conservation of water resources	Technical conference or seminar	NA	Regional water planning groups	None
Welder Wildlife Foundation	Ecology, environmental management, conservation, fire regimes, and water quality	Indirect training: Education or outreach events	NA	Land owners, naturalists, and local residents and their children	N/A - education or outreach

1.5 Analysis of Findings

Several market analysis questions were included on the Mission-Aransas NERR needs assessment survey to gather additional input from coastal decision-makers in this document. The needs assessment survey was distributed to 215 coastal decision-makers in the Coastal Bend and received 108 responses (over 50% response rate). Of those surveyed, 21 respondents reported providing training opportunities beyond the scope of typical education or outreach activities (Figure 3).

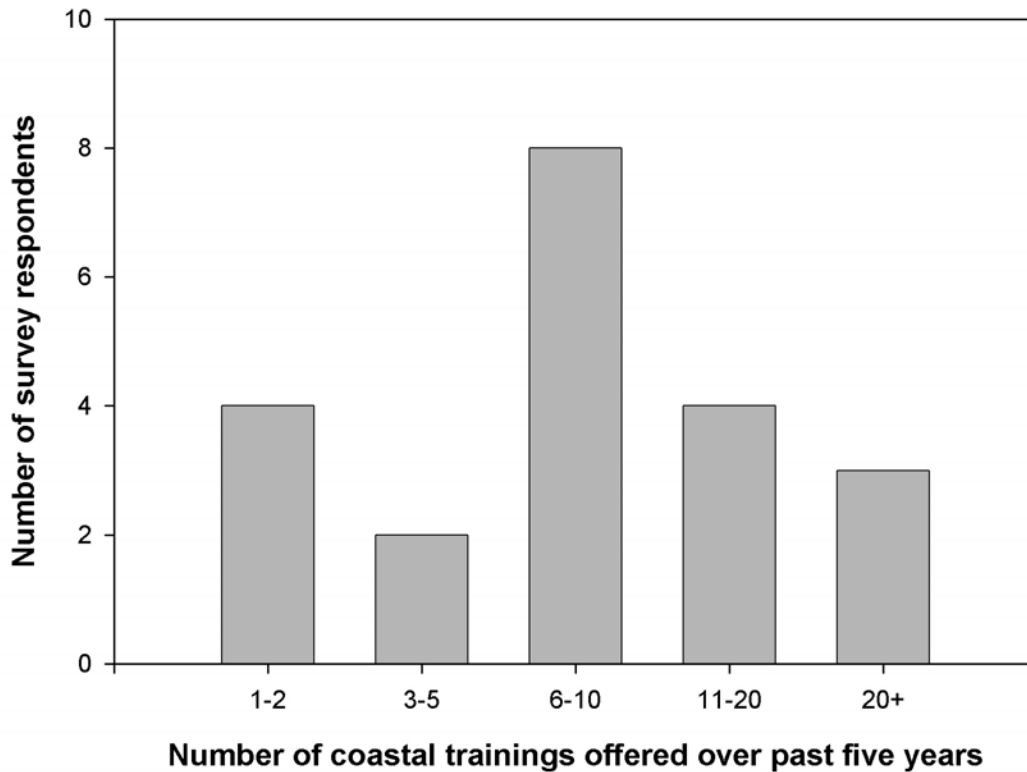
Figure 3. Services provided among respondents.



Of those respondents that reported providing coastal training, 14 provided fewer than ten events over the last five years (fewer than two per year), while only three respondents had provided more than 20 trainings over the last five years (more than four per year) (Figure 4). This suggests that several organizations provide a number of training opportunities, but the majority hold events infrequently. Additionally, the small number of respondents that reported providing high levels of training in the past five years suggests that a core group of entities have been responsible for past local training efforts.

The survey also sought information to determine the importance and availability of partnership opportunities for coastal training. Based on survey responses, approximately 66% of local training events occurred through partnerships. This suggests that some training events might have been counted twice in the survey results with multiple respondents reporting the same event. Also, 80% of respondents indicated that they would be willing to partner with the Mission-Aransas NERR in some way to increase the amount of training available in the region. Together, these responses demonstrate the importance of partnerships in coastal training activities.

Figure 4. Number of coastal trainings offered by survey respondents.



To complement data from the needs assessment survey, this analysis also used the list of topics from the survey to identify the topics of existing training efforts. Each topic from the list was evaluated based on research and telephone interviews to identify topics where some level of training was available and to indicate which entities have addressed the topic (Table 3). In some cases, multiple organizations provide training on the same topics. These cases represent potentially duplicate efforts; however, these cases may also represent reasons for multiple events such as an essential topic, varying aspects of the topic, or other restrictions that require multiple events such as geographic or social barriers. Training topics already addressed by another organization in some way represent ideal opportunities for partnership, especially in cases where there is a clear need for additional training, despite the existing effort.

The list of topics included in the needs assessment survey was subdivided into five categories: habitat, coastal management, water/air, planning and regulation, and resource management. Each of the five categories contains between five and seven topics in which there is an existing training effort, except for the coastal management category. This category only contains two topics with an existing training effort and each of these topics is only addressed by one entity. As such, topics of coastal management such as coastal and estuarine processes represent potentially important topics of training for the Mission-Aransas NERR. Refer to the needs assessment document for further information on local training needs.

Table 3. Issues addressed by training events from local entities.

Habitat Issues	
Biodiversity	Fennessey Ranch, Welder Wildlife Foundation
Endangered/threatened species	Fennessey Ranch, Welder Wildlife Foundation, TPWD
Fire management	Fennessey Ranch, Welder Wildlife Foundation
Habitat buffers	Fennessey Ranch, Welder Wildlife Foundation, NRCS
Invasive species	AES
Native species	AES
Wetland protection/management	Fennessey Ranch
Coastal Management Issues	
Coastal erosion and accretion	GLO
Recreational use	AES
Water/Air Issues	
Combined sewer outflows	Rockport Water Quality Committee, AES
Eutrophication & nutrient loading	Rockport Water Quality Committee, AES, GLO
Non-point source pollution	TSSWCB
Point source pollution	TCEQ
Septic system issues	Rockport Water Quality Committee, TAMUCC, CBBF, TCEQ
Waste water management	Rockport Water Quality Committee
Water resources (supply & quality)	TWDB, NRCS
Planning and Regulation Issues	
Conservation land planning	AES, Texas Chapter of the APA
Environmental health	AES, GLO, Rockport Water Quality Committee
Environmental legislation	TPWD
General land planning	AES, Texas Chapter of the APA
Sustainable building, development, and/or industries	AES, Texas Chapter of the APA
Resource Management Issues	
Agricultural issues/practices	Fennessey Ranch, NRCS
Critical area delineation and management	AES, Fennessey Ranch, Welder Wildlife Foundation
Ecological landscaping	AES
Environmental education	AES
Erosion control	GLO
Watershed management	TCEQ, TPWD, TSSWCB

To identify other opportunities for coastal training, a gap analysis was used to identify training topics that were not being addressed by other organizations in the area (Table 4). The gaps in the existing training effort represent areas where additional training does not risk duplicating a known training effort. These topics represent training gaps for local coastal decision-makers, although specific topics should not be identified solely by existing market conditions. The gap analysis revealed two categories of issues with 11 topics each, coastal management and resource management. This suggests that training in these categories will fill gaps in existing training efforts. The needs reported by coastal decision-makers in the needs assessment will provide the additional information to identify topics for training that meet coastal decision-maker needs while avoiding the duplication of an existing effort.

Table 4. Issues not addressed by training events from local entities (Gap Analysis).

Habitat Issues	Water/Air Issues
Habitat restoration	Air emissions/air quality
Protected/special area management	Groundwater issues
Streambank restoration	Sedimentation
Wildlife Corridors	Thermal pollution
Coastal Management Issues	Resource Management Issues
Beach and nearshore ecology	Aquaculture/mariculture
Coastal public access	Conservation technologies
Coastal and estuarine processes	Environmental monitoring
Coastal hazards	Estuarine Ecology
Coastal zone management	Fisheries/by-catch issues
Dredging and filling	Fisheries and fishery law
Fisheries management	Forestry issues
Marina management	Global climate change/sea level rise
Port/harbor planning and management	Mineral, oil, and natural gas extraction
Saltwater intrusion	Real estate issues
Shoreline upland ecology	Renewable energy
Planning and Regulation Issues	
GIS	
Interagency coordination	
Regulatory compliance	

1.6 Conclusions

The Mission-Aransas NERR is developing a CTP within the framework of the NERRS. This market analysis will inform the program development about the current training market and will identify potential partnerships as well as existing training efforts. The CTP development will tailor training events to meet specific needs in regard to both content and location.

The majority of the Mission-Aransas NERR lies within Aransas County and this area will be a primary focus of coastal decision-maker training events for the CTP. Since future development is predicted to impact the area, it is likely that planning and regulation issues will be future topics for CTP training events. Key partnerships for training events in the Aransas County area include Aransas County AES, NOAA CSC, and Texas Chapter of the APA. It is also anticipated that there will be training needs for issues related to ecotourism and natural resources and therefore it is important that partnerships be created with TAMUCC, TCEQ, and TPWD.

The majority of the training events hosted in Aransas County will occur in the City of Rockport because it is the biggest population center in the area and contains several venues and facilities appropriate for CTP events. Rockport Water Quality Committee meetings can be also used as an outlet for technical seminars. In addition, the CTP can partner with the committee to use technical seminar speakers for training events outside the water quality meetings.

Nueces County contains the largest population of the counties represented by the Mission-Aransas NERR and the City of Corpus Christi and Port Aransas will be a key focus of CTP coastal decision-maker training events. Large population centers and anthropogenic impacts in this county indicate that there will be many training needs that the CTP can seek to provide. Key partnerships for training events in the Nueces County area include NOAA CSC, TAMUCC, Nueces County AES, TxDOT, and the Texas Stream Team.

The Mission-Aransas NERR headquarters are located in the City of Port Aransas and will be the primary location for training events that target decision-makers in Nueces County. Coastal Bend Bays Foundation will also serve as an outlet for technical seminars. In addition, the CTP can partner with CBBF to use technical seminar speakers for training events outside the City of Corpus Christi.

Much of the Mission-Aransas NERR lies within Refugio County and it is anticipated that CTP training events in this area will focus issues such as groundwater, agriculture, and ranching. San Patricio County lies adjacent to Refugio County and also has similar issues including agriculture and ranching. Training events will likely seek decision-makers from both counties due to their small populations and similar interests in the issues. Key partnerships for this area include the NOAA CSC, NRCS, Welder Wildlife Foundation, Nueces County AES, Refugio County AES, San Patricio County AES, TCEQ, TSSWCB, and TWDB.

It is anticipated that the majority of the training events hosted in Refugio and San Patricio County will be hosted in the Cities of Refugio and Sinton, which are the largest cities in the counties. Training events that require field sites, will rely upon the facilities at Fennessey Ranch and potential partnerships with Welder Wildlife Foundation.

Additional CTP events will be provided on an as needed basis for other counties in the Mission-Aransas NERR watershed. CTP partnerships with the CBBEP and NOAA CSC are vital to the success of the program. Although CBBEP does not host training events, this agency is well informed of the issues, information needs, and decision-makers in the Coastal Bend region. NOAA CSC will be an important partner to the CTP because this agency has the capacity to provide resources such as speakers and training materials that are tailored to the training needs of the Coastal Bend region.

In general, it appears that two types of training events are predominant in the Coastal Bend (Table 2). The first common training type is a “forum or public meeting.” This meeting type is characterized by an open attendance with presentation and discussion format. This type of training offers a valuable forum for coastal decision-makers to clarify their understanding of the issues presented. These training events typically do not incorporate post-training evaluations.

The second common training type is a “technical conference or seminar.” This type of training can be similar to the forum or public meeting training type, but typically attended by smaller groups that have previous knowledge of a subject. This training type is common among professions that require or encourage continuing education such as government technical staff, city planners, and professional engineers. These training events tend to follow a pre-determined schedule of topics and allow for the use of surveys as post-training evaluation instruments to gather information about comprehension, retention, and training logistics.

Despite the prevalent nature of these two training types, it is likely that the Mission-Aransas NERR will most often offer training events that would fall into one of these two categories. The prevalence of these training types suggests that this format serves the needs of those attending and are likely to be successful. In some instances, the Mission-Aransas NERR will attempt to increase the variety of training types to include “certification programs” and other less common training types.

Several questions on the needs assessment survey were intended to gather information for this market analysis. Among respondents to the survey, 21 reported providing some form of coastal training in the past five years. Of those who have provided training during this period, 14 provided fewer than ten trainings in the past five years. Approximately 66% of trainings occurred through partnership and 80% of respondents stated that they would be willing to partner with the Mission-Aransas NERR in some way to increase the amount of training available in the region.

Of the five categories of topics, four of them contain between five and seven topics with some level of existing coastal training. Within each of these general topic areas, a core group of entities provide the majority of the training events (Table 3). A gap analysis also indicated that there is no existing training effort for multiple topics in each category of issues (Table 4). While specific training needs will be evaluated in the needs assessment analysis, the information in this document will prove valuable in avoiding duplicate trainings and identifying potential partners for future training events.

The findings of this document suggest that the Mission-Aransas NERR is well positioned to have a positive impact on coastal training through the efforts of staff who are dedicated to providing coastal training and by developing key partnerships with entities in the Coastal Bend that are also conducting training events.

Coastal Training Needs Assessment
Mission-Aransas National Estuarine Research Reserve

2.0 Needs Assessment Summary

Establishment of a successful Coastal Training Program (CTP) requires determining local training needs. The Mission-Aransas National Estuarine Research Reserve (NERR) completed a survey effort to provide data for a training needs assessment. This needs assessment will define the scope of the CTP by describing types of training needed, training topics, and logistical preferences for training events.

This document describes the methods, analysis, and results of the needs assessment survey. Survey findings include a detailed review of the survey data with information about training preference and respondents' evaluation of their general knowledge, work-related experience, and perceived need for training on a variety of coastal issues. Additionally, this section includes a review of the same findings for the subgroup of public sector respondents. The survey findings section also reviews the results of the follow-up interviews and a discussion of the assumptions and limitation of this analysis.

This document reviews the logistical and cost preferences of coastal decision-makers for training events. Findings suggest that the Mission-Aransas NERR should host training events predominately in the winter months and attempt to avoid hosting events in the summer months. Additionally, training events should begin in the morning, not exceed one day and be scheduled to be as short as possible. Respondents also had a significant preference to communicate with trainers using e-mail and the internet. The survey indicated that a \$15 training fee would accommodate approximately 84% of respondents, who would also be willing to pay approximately \$3.50 for breakfast, \$7.00 for lunch, and \$10.50 for dinner. The majority of respondents were willing to travel 28 miles one-way to reach a training event. This demonstrates a need for the Mission-Aransas NERR to host training events in local communities whenever possible to ensure adequate attendance. Again, the data for the subset of public sector respondents is consistent with these values for cost and distance.

Findings suggest that coastal decision-makers require additional training events than those currently available in the Coastal Bend. The categories that rated the highest for perceived need for training are planning and regulation and habitat. In regard to specific issues, the Mission-Aransas NERR should focus training events on the top two rated issues in each of these categories: wetland protection/management, regulatory compliance, habitat restoration, and general land planning. Additional training efforts should consider the issues ranking highest in the remaining categories: coastal zone management, water resources, environmental education, coastal erosion and accretion, wastewater management, and erosion control. Follow-up interviews indicated the presence of a variety of training needs related to water quality and coastal development/management.

In addition to analyzing the entire data set, the subset of public officials was also reviewed. In general, the public sector aligned closely with results of the entire data set. However, general land planning was an important issue as indicated by low levels of general knowledge and work-related experience, that was combined with a high need for training in this area. Additionally, ratings for perceived need for training were significantly high for both the entire data set and the public sector subset. This reiterates the need for additional training events in the Coastal Bend.

Overall, this document will be used to develop a CTP for the Mission-Aransas NERR. The logistical preferences conveyed by survey respondents will inform the form and function of future events. The survey results will provide the basis for future training events that meet the stated needs of coastal decision-makers to increase the utility of these efforts in meeting program goals. Additionally, the program can specifically address the needs of high priority groups such as the local governmental officials represented by the public sector respondents.

2.1 Introduction

The Mission-Aransas National Estuarine Research Reserve (NERR) is developing a Coastal Training Program (CTP) that provides up-to-date scientific information and skill-building opportunities to individuals who make decisions that affect coastal and estuarine resources. An integral part of establishing a successful program is determining the training needs in the region surrounding the Mission-Aransas Estuary, known as the Coastal Bend. A valid needs assessment required input from a variety of coastal decision-makers in the Coastal Bend. For the purposes of this document, a “coastal decision-maker” is any individual who makes regular decisions that impact the coastal or estuarine environments either directly or indirectly through their professional or volunteer activities. The Mission-Aransas NERR undertook a survey effort to collect data from individuals who met these criteria. Survey results are compiled in this needs assessment that will provide guidance for the CTP to develop programs and training events that fulfill the needs of the local decision-makers. The needs assessment outlines the training needs of coastal decision-makers including the types of training needed, training topics, and logistical preferences for training events. Additionally, the needs assessment analyzes needs expressed specifically by public sector survey respondents, because they are the primary coastal decision-makers in the Coastal Bend.

2.2 Methods

This needs assessment relies on data collected from decision-makers in the Coastal Bend. The first step in this process was to establish a list of individuals that are coastal decision-makers in the local area. After a list of coastal decision-makers was compiled, a survey was created and distributed to those individuals. Survey responses were collected and analyzed to determine the training needs identified by respondents. Finally, responses from those in the public sector were considered as a subset of the data to determine the specific needs of this group of coastal decision-makers.

The compilation of coastal decision-makers was initiated by modifying and adding to a list of existing contacts developed through the designation process of the Mission-Aransas NERR. This list was refined to delete contacts that were not coastal decision-makers and was revised to incorporate changes in contact information. This contact list was then supplemented to include other individuals that qualified as coastal decision-makers. Supplemented individuals were identified through research using the internet, phone books, and interviews with local governmental officials. The involvement of local government officials was critical as these individuals are among the primary coastal decision-makers in the Coastal Bend.

The contact list included a wide variety of potential respondents including heads of local government, local elected officials, other government officials, and other coastal decision-makers. A head of local government included officials such as county judges and local mayors, while other elected officials included individuals from county commissions, city/town councils, and elected committees and groups such as the Planning and Zoning Committee or the Aransas County Navigation District. Additionally, responses were sought from a variety of appointed government officials and government staff that would include officials such as City Manager and City Planner as well as unelected committees such as the Rockport Water Quality Committee. Finally, the contact list included coastal decision-makers who generally fell outside of the governmental process such as professional engineers, consultants, real-estate agents, builders, contractors, fishers,

university professors, representatives of local Chambers of Commerce, and not-for-profit organizations addressing coastal and estuarine issues. The list of coastal decision-makers was not, nor was it intended to be, representative of the general population, and the selection of potential respondents was not random. While efforts were made to include a diversity of potential respondents, some biases may exist in the selection and survey methods. Local elections occurred during the administration of the survey, which will date the survey results but should not significantly influence the overall trends observed due to the relatively few number of individuals whose status as a coastal decision-maker was influenced by the election. Additional description of the local counties, cities, and entities providing training is included in the market analysis.

Survey questions were developed to identify information about the need for coastal training efforts in the Coastal Bend. The survey was divided into the following sections:

- General information including contact information for the respondent
- Characterization of existing knowledge for various topics or issues
- Characterization of work-related experience for the same topics or issues
- Characterization of the perceived need for training for the same topics or issues
- Characterization of training preferences and past training experiences.

The questions were reviewed throughout survey development and with a test group comprised of a small set of individuals with a variety of backgrounds. Revisions were made to the questions after each test group trial. After performing a minimum of ten test trials of the survey, revisions were then made to the hard copy in order to increase comparability between the electronic and hard copy survey forms. The survey included a variety of question types (i.e, multiple choice, rating, free response) and care was taken to minimize the amount of time needed to complete the survey. Testing indicated that the survey could be completed in as few as 15 minutes but should not require more than 30 minutes to complete. The electronic version of the survey had the capacity to apply logic to survey questions and this technique reduced the time needed to take the electronic survey in comparison to the hard copy survey. For example, logic would allow a public employee to avoid reading questions directed at those in private industry. The use of survey logic is one key difference between the electronic survey and the hard copy survey. Hard copy surveys were distributed with a general purpose letter intended to meet the needs of all participants rather than the group letters used to promote the electronic survey notifications. This allowed these surveys to be taken to meetings and public events to accommodate any requests for hard copies. An example of the hard copy survey is included in Appendix 1.

After the contact list of coastal decision-makers was complete and the survey was created, the survey was distributed by mail, in person, and electronically using an internet tool called SurveyMonkey® (www.surveymonkey.com). During survey development, announcements at various events served as initial notification of the survey effort. The first formal correspondence to follow these announcements was a letter sent via e-mail to individuals on the coastal decision-maker contact list that included a hyperlink to the electronic survey. The cover letter was specific to the respondents' sector of employment and contained basic information about the survey effort including: what the survey information would be used for, an assurance that no responses would be connected to individual respondents in any report, and, for those distributed by e-mail, a website hyperlink was included to provide access to the survey (Appendix 2). Additionally, each letter encouraged respondents to contact the CTP Coordinator if they experienced any technical

difficulties or preferred to fill out a hard copy of the survey rather than the electronic copy, accessible through the internet.

The initial date of survey distribution was recorded for each survey recipient. For the surveys distributed electronically, each e-mail was carbon copied to the CTP Coordinator and a “read receipt” was requested from the respondent. These measures were undertaken to increase the accountability for respondents and therein encourage a higher survey response rate. Correspondence from the respondent was saved for future reference and is discussed when appropriate throughout this document.

A second e-mail reminder was sent approximately one month from the initial distribution. This reminder included the date of the first contact and a deadline for completing the survey in addition to the relevant information from the first letter. Respondents were all sent the same letter during this round of contact, and some respondents were contacted via telephone to encourage their response (Appendix 3). This second round of e-mails followed a similar procedure as the first round, in that the date of contact was recorded, a carbon copy was sent the CTP Coordinator, and a “read receipt” was requested from the respondent. Again, these measures were undertaken in order to encourage respondents to complete the survey. Approximately two weeks after sending the reminder e-mail, the survey was closed.

Any survey submitted in a hard copy format was entered into SurveyMonkey® manually before data was downloaded into Microsoft Excel® for analysis. Due to the format in which SurveyMonkey® stores survey responses, most responses were originally recorded in text. In order to explore statistical relationships, all standard responses involving text were coded into integer values. Any answer left blank by a respondent was also left blank in the resulting data codes. When necessary, responses were coded using a vertical look-up function, in order to assign all possible text responses a corresponding numerical value. This operation was not performed in instances where respondents were asked to expand upon, explain, or provide any additional information. These responses were handled on an individual basis and are addressed as necessary throughout this document. The final coded responses were cross-checked for errors prior to data analysis.

A variety of statistical methods and techniques were used to evaluate the data generated by the needs assessment survey. All statistical analysis was performed using Microsoft Excel®. The statistics presented include arithmetic means, medians, standard deviations, standard errors, and measures of significance. Two separate methods were used to calculate the standard deviations. In general, the standard deviation for the data was calculated by measuring the square root of the variance, using the following formula:

$$SD = \sqrt{\left(\frac{1}{(n-1)}\right) \sum (x_i - x_a)^2}$$

Where *SD* represents the standard deviation, *n* represents the number of observations, *x_i* represents the observed value of each response, and *x_a* represents the average response. In essence, this equation calculates the variance of each response, recorded from the average response for that question, and uses this information to calculate the standard deviation based on the sample size.

For responses measured in percentages or those involving a discrete choice between two options, the bootstrap method was used to determine the standard deviation. This method estimates the standard deviation of the data by assuming that the survey responses are representative of the population of coastal decision-makers. This measure provides a good estimate for reasonably large sample sizes and allows for measures of standard deviation to be taken when otherwise impossible. Standard deviation was calculated using the bootstrap method by the following formula:

$$SD = \sqrt{(x * (1 - x))}$$

Where SD is the standard deviation and x represents the percentage of respondents indicating a particular selection in the survey.

In addition to calculating standard deviations, the needs assessment used a z-test to test the statistical significance of findings. The z-test uses the following formula:

$$z = \frac{(x_O - x_E)}{SE}$$

Where z represents the desired result, x_O represents the observed value, x_E is the expected value, and SE is the standard error. The standard error is calculated using the standard deviation and relating it to the standard normal cumulative probability curve. The z-statistic describes how many standard errors away the observed value is from the expected value or null hypothesis. By applying this information to a standard normal table a p-value or an observed significance level can be determined. The p-value is the probability of getting a z-statistic as extreme or more extreme than the observed value on the basis that the null hypothesis or observed value is correct. Thus, the smaller the p-value, the stronger the evidence is against the null hypothesis and the more statistically significant the result. In keeping with the literature, this needs assessment depicts results as significant at p-value of less than 5%. Other results were labeled as not statistically significant and treated as such throughout the document.

In addition to reviewing the entire data set, a subset of public sector responses were analyzed to identify both the specific needs of this group and differences to the entire data set. The watershed of the Mission-Aransas NERR spans nine counties which include more than 20 municipalities ranging from small, rural communities to larger urban communities such as Corpus Christi. Local governments in Texas wield tremendous authority which, when combined with the number of municipalities, complicates the management of environmental resources that span political boundaries. Given the relative importance of local governmental officials as coastal decision-makers, analysis of the subset of public sector respondents is included throughout this document. Further subdivision of survey respondents was considered in this analysis, but statistics were not reported here due to concerns resulting from small sample sizes. This approach will allow the CTP to generally address the needs of local coastal decision-makers, while specifically exploring the needs of respondents in the public sector that represent an essential audience.

This analysis was concluded with several follow-up interviews with a sample of survey respondents. These interviews were designed to collect in-depth information about specific training needs beyond topical preferences such as technical skills or management tools (Appendix 4). A total of six survey respondents were contacted in December 2008 through telephone numbers furnished in the survey. Interviewees were given a brief update to remind them of the survey and to describe the reason for

performing follow-up interviews. Respondents were then asked a series of questions about their training needs.

2.3 Survey Findings

Survey research relies heavily on achieving a satisfactory response rate, and the response rate for the Mission-Aransas NERR needs assessment survey was 50.2% (52.6% public sector and 47.4% private sector). A total of 215 survey invitations were sent, of which, 108 responses were received, including both electronic and paper copies. For this type of survey, a response rate of 30-40% is considered average, so 50% is a good rate of response, serving as a testament to the commitment of many local coastal decision-makers and the efforts taken in survey marketing and distribution (University of Texas Division of Instructional Innovation and Assessment 2007).

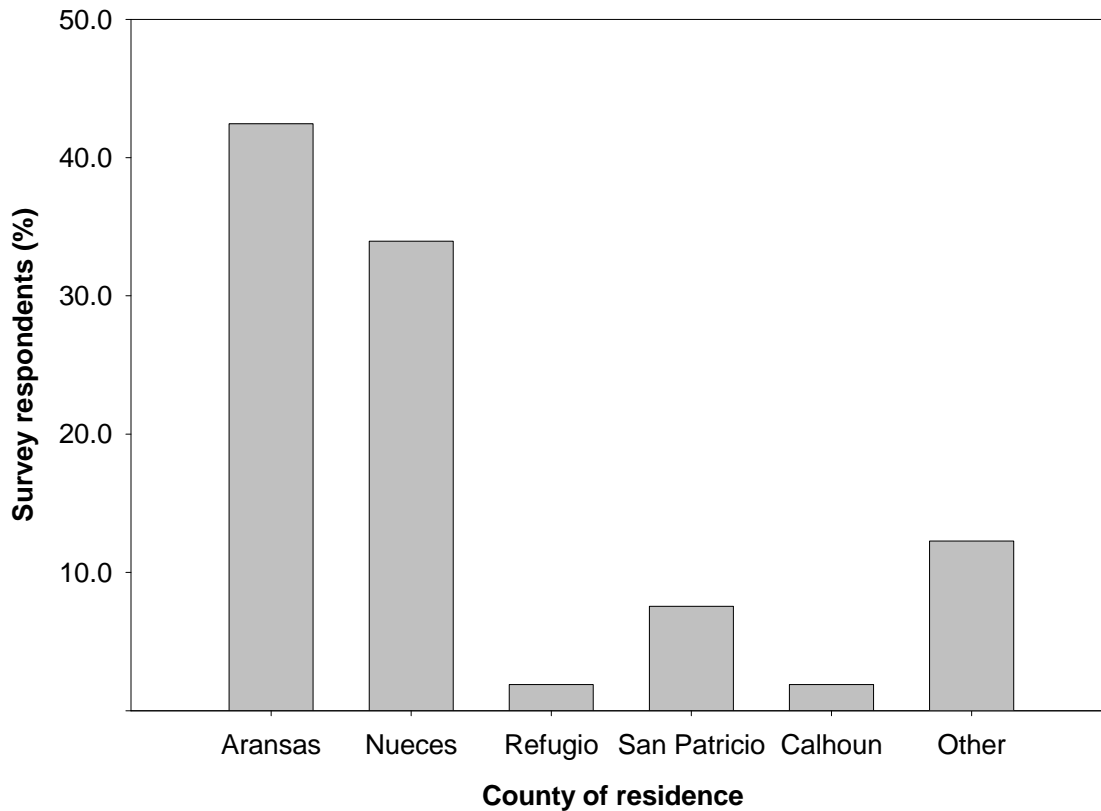
2.3.1 Background of Respondents

Residential Information

The majority of survey responses were received from coastal decision-makers that reside in the five counties adjacent to the Mission-Aransas NERR. The survey had the highest response from Aransas County (42.5%) (Figure 5). Participants also contributed from Nueces County (34%), San Patricio County (7.5%), Refugio County (1.4%), and Calhoun County (1.4%). Ideally, a higher percentage of the responses would have been received from San Patricio, Refugio, and Calhoun counties, but these counties have smaller populations with fewer coastal decision-makers than Aransas County or Nueces County. A high response from Aransas County and Nueces County is important for the needs assessment because these counties exert a disproportionate influence on the Mission-Aransas Estuary due to their large populations and close proximity. Although Aransas County and Nueces County received the highest percentage of responses overall, Nueces County contained a higher percentage of public sector respondents (39.1%) than Aransas County (37.5%).

A total of nine respondents indicated that they lived outside the five counties included in the Mission-Aransas NERR. These other counties included Bee, Chambers, Harris, Jim Wells, Matagorda, Medina, Travis, Webb, and Williamson. These counties seem to be divisible into two distinct groups. The first group includes coastal counties to the north of the Mission-Aransas NERR that surround the City of Galveston (Chambers, Harris, and Matagorda). Each of the respondents from these areas represents a regional interest in the environment of the Coastal Bend and met the definition of a coastal decision-maker. The second group includes one county (Bee) in the watershed of the Mission-Aransas NERR and several other inland counties (Jim Wells, Medina, Travis, Webb, and Williamson). With the exception of the response from Webb County, each of these respondents was identified as a coastal decision-maker; the response from Webb County included insufficient information to be included in further analysis. The effects of this distribution are discussed in section 2.3.5.

Figure 5. Residency distribution of survey respondents.



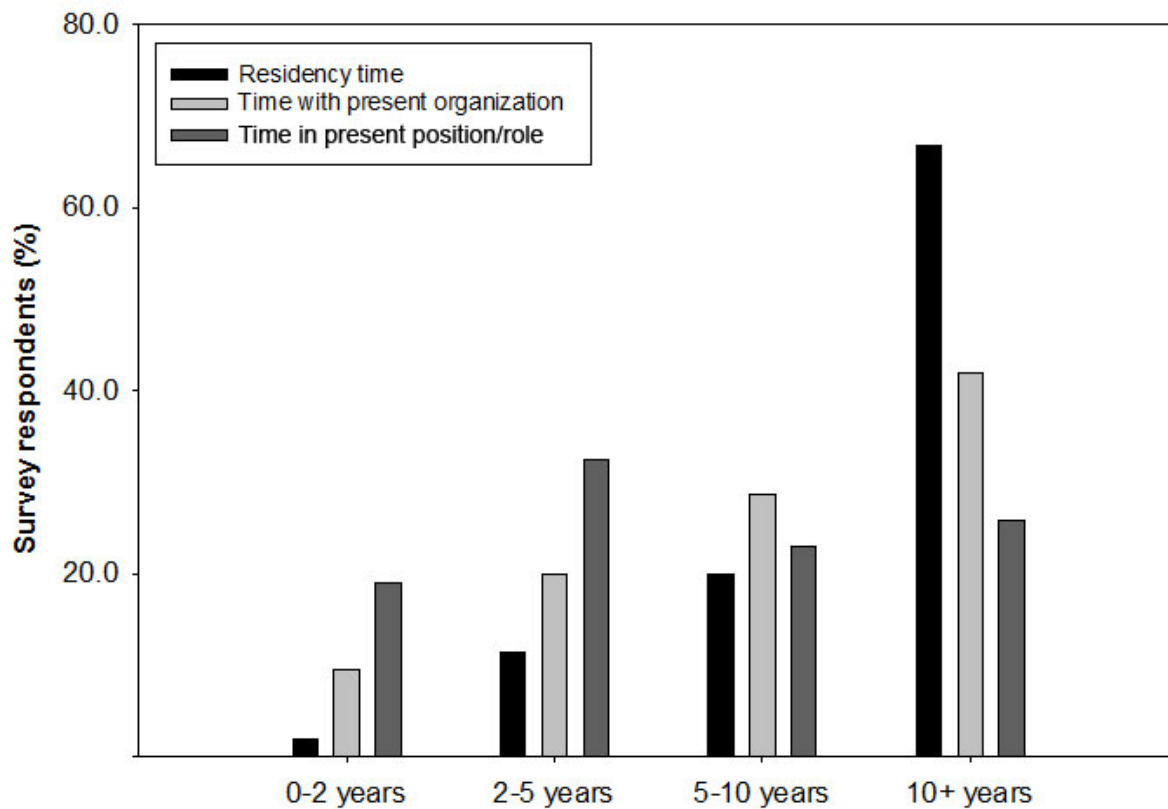
Duration of Residency and Experience

The survey included three questions to determine the duration of residence, as well as professional and civic experience. The first of these questions was intended to characterize the residency time of the respondent. The majority of respondents indicated that they had lived in the Coastal Bend for more than ten years (66.7%) (Figure 6). This suggests that the respondents have significant local knowledge and likely possess considerable experience with environmental issues and the decision-making process in the Coastal Bend. An additional 20% of respondents indicated that they had lived in the Coastal Bend for 5-10 years providing further indication that respondents likely possess sufficient knowledge and experience of the Coastal Bend. Only 11.4% of respondents had lived in the Coastal Bend for 2-5 years, and 1.9% of respondents had lived in the Coastal Bend for fewer than two years. This pattern supports the notion that respondents have local knowledge and/or experience, and that the results of this survey are representative of the current training needs.

The survey also included a question about the length of time the respondent had worked for their entity. Most respondents had worked for more than ten years with their current employer (41.9%) and 28.6% of respondents indicated employment for 5-10 years with the same entity (Figure 4). Few respondents indicated employment with their current organization for less than five years (29.5%) and only 9.5% reported periods of employment at less than two years. Results indicate that respondents have adequate local experience to provide valuable survey responses.

To explore the diversity of the respondents’ experiences, the survey asked about how long respondents had held their present position within their entity. Most respondents had held their current position for 2-5 years (32.4%) and 25.7% of respondents have held their present position more than ten years (Figure 6). A small percentage of respondents indicated holding their current position for less than two years (19.0%). When combined with the previous two results, this suggests that respondents have primarily held multiple positions with their current employer or held one position for their employer for some duration. This variety ensures that the responses include different types of experience. Additionally, responses from the public sector demonstrated the same trends as the overall data set.

Figure 6. Duration of residency and employment for survey respondents.



Sector of Employment

To explore the respondent backgrounds, the survey included a number of questions regarding sector of employment. The majority of respondents replied that they worked in the public sector (61.5%) and 38.5% of respondents replied that they worked in the private sector. This result is not surprising due to the efforts taken to contact individuals in the public sector who comprise the primary group of coastal decision-makers in the Coastal Bend.

Those in the public sector were also asked if their positions were elected, appointed, or neither. The majority of these respondents answered that they were neither elected nor appointed (57.8%); while,

21.9% of these respondents indicated that their positions were appointed and 20.3% that their positions were elected. Additionally, 60.9% of public sector employees described their positions as non-regulatory while 39.1% of these respondents described their positions as regulatory.

Respondents in the private sector were asked if their company or organization was for-profit or not-for-profit. Private sector respondents were distributed evenly with 51.2% working for a profit and 48.8% working for not-for-profit organizations.

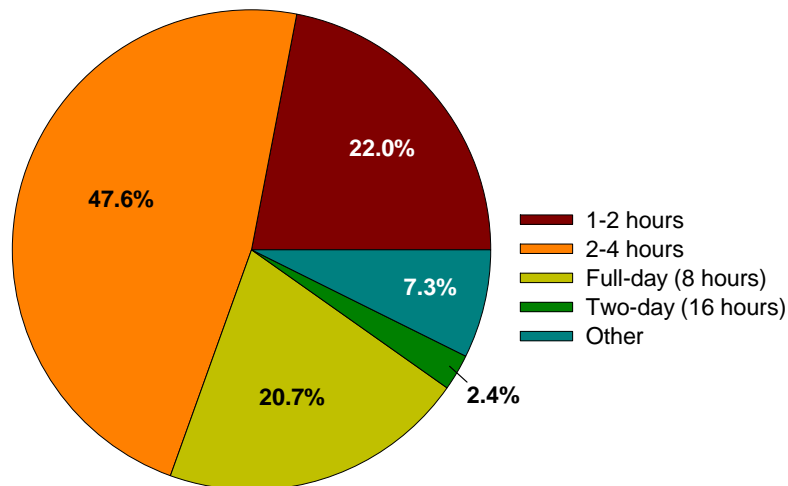
In addition to classifications based on the criteria from the survey, an additional classification was added for each respondent to identify their sector of employment based on the groupings outlined in the NERRS CTP Performance Monitoring Manual (2006). This document identifies ten groupings for identifying audiences for reporting purposes. These groupings are general but are more specific than those used for the survey. Survey respondents included three from the federal government, 18 from the Texas state government, 15 from county governments, two from regional professionals, 14 from local governments, 36 from a wide variety of business interests, 13 university faculty and staff, seven other community members, and 14 from the non-profit community. No respondents were identified as media or tribal.

2.3.2 Respondent Training Preferences

Training Length

Another objective of the survey was to identify preferences of meals, timing, seasonality, and training length. Respondents indicated a preference for shorter training events, demonstrating a significant preference for training events of 2-4 hours in duration (47.6%, $p \leq 0.0001$) (Figure 7) (Public sector: 44.9%, $p \leq 0.0001$). Although not a significant result, the second most frequently preferred training length was 1-2 hours (22.0%). Thus, almost 70% of respondents prefer a training no longer than four hours. An additional 20.7% of respondents preferred a training event lasting one day while only 2.4% preferred a training event lasting two days. The remainder of the respondents (7.3%) selected the other option with all but one response being “it depends” or some variation.

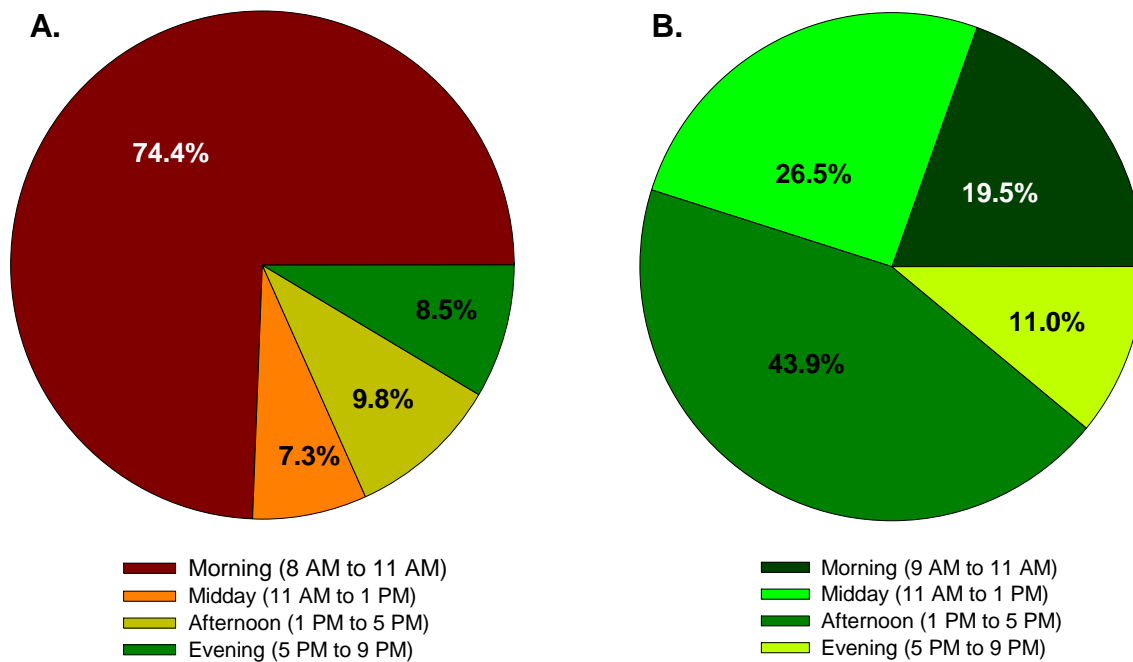
Figure 7. Training length preferences.



Start and End Timing

Respondents demonstrated a significant preference to begin events in the morning (8 AM to 11 AM) (Figure 8a) (74.4%, $p \leq 0.0001$) (Public sector: 75.5%, $p \leq 0.0001$). Fewer than 10% of respondents preferred any other starting time. More variation was observed in finish times for a training event. Respondents demonstrated a significant preference for training to conclude in the afternoon (between 1 PM and 5 PM) (43.9%, $p \leq 0.0003$) (Figure 8b) (Public sector: 51.0%, $p \leq 0.0001$). Preferences for start and finish time for training events will inform future training schedules.

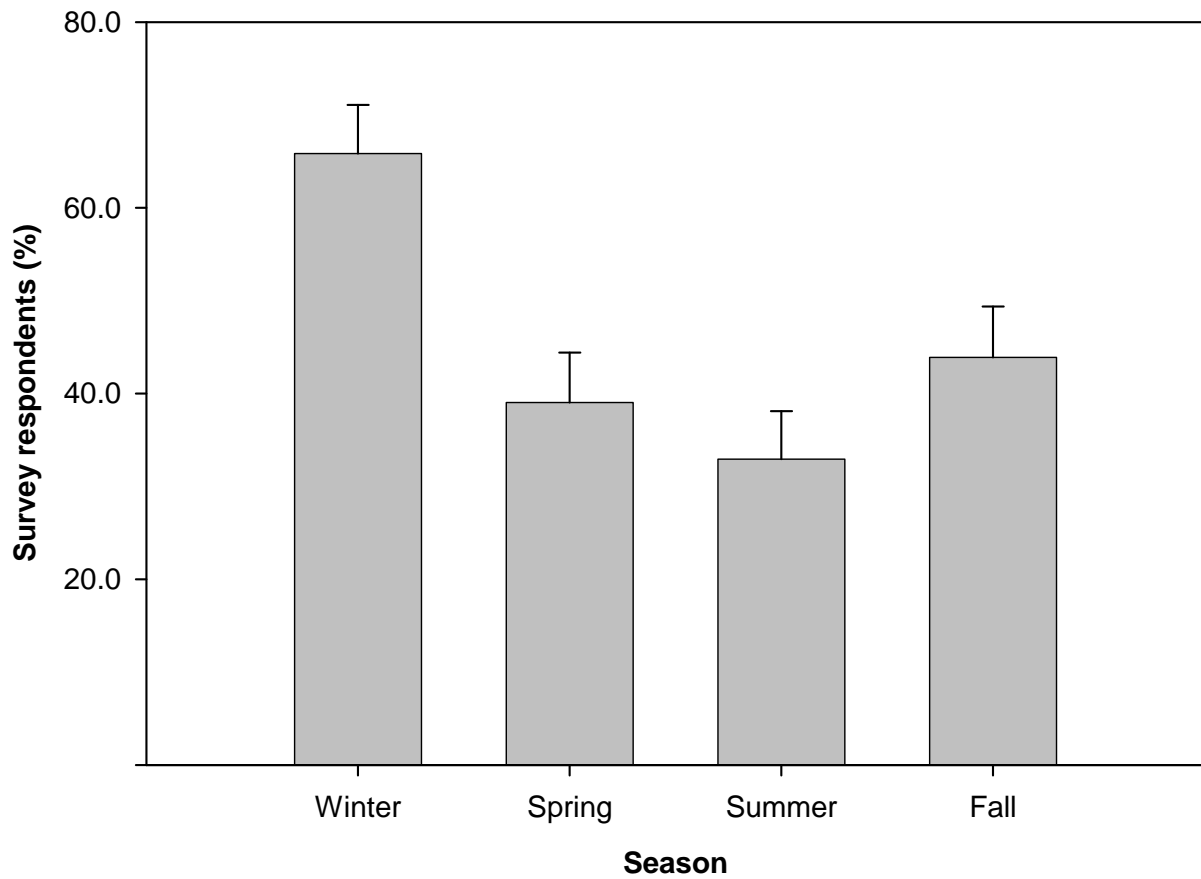
Figure 8. Preferred start and end time for training. A: start time preference. B: end time preference.



Seasonality

Respondents were asked in which season(s) they would prefer to have training events. A significant percentage of respondents (65.9%, $p \leq 0.0022$) preferred to have training events in the winter (Figure 9) (Public sector: 65.3%, $p \leq 0.0015$). Summer was the least preferred season for training events with a response of 32.9% ($p \leq 0.0005$). The respondents second least preferred season for training was the spring with a percentage response of 39.0% ($p \leq 0.0207$). While 43.9% of respondents preferred training events in the fall, this was not significant. This suggests that the Mission-Aransas NERR should focus training efforts in the winter months, while reducing training efforts in the spring and summer.

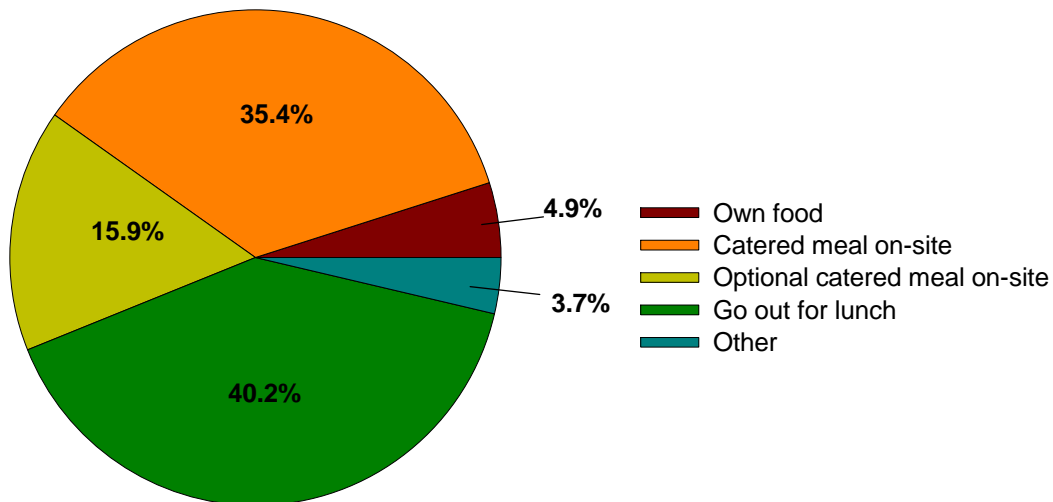
Figure 9. Training preference for time of year.



Meal Preferences

The survey also evaluated preferences for meal locations at training events. The most frequent selected option was time available to go out to lunch (40.2%, $p \leq 0.0025$), followed by the preference to have meals catered on-site with the cost included in the training price (35.4%, $p \leq 0.0250$) (Figure 10). An additional 15.9% of respondents preferred the option of purchasing a meal on-site in advance, and respondents clearly would not prefer to provide their own food and beverage, as only 4.9% of respondents selected this option. Several respondents (3.7%) provided a different response. Of these responses, one respondent suggested than any of the options provided would be acceptable, while another respondent indicated a desire to only have water available. The responses of public sector respondents closely mirrored the trends demonstrated by the analysis of the entire data set.

Figure 10. Meal preferences for training events.



Willingness to Pay for Training

While the CTP strives to provide events free of charge, some events may require a small fee to offset costs. The needs assessment survey explored cost preferences for training events. When asked how much they would be willing to pay for a full-day training event that included an out-of-town speaker and refreshments such as coffee, tea, water, and cookies, respondents indicated they would spend an average of \$42.33 (Table 5). The survey results indicate that, assuming the responses are normally distributed, 84% would be willing to pay at least \$15.82 for such a training event. The results for the subset of public sector respondents are consistent with these figures and trends. Some respondents (8.5%) provided alternative answers to these questions. These respondents usually conveyed a response of “it depends” or some variation, while one respondent replied with a value of \$0 indicating that they would not be willing to pay for a training event.

Respondents also demonstrated that training value is associated with training length. Over 80% of respondents indicated that they would pay more for a longer training event or less for a shorter training event. Only 19.5% of respondents considered training cost independent of training length.

Alternatively, only 15.9% of respondents would be willing to pay more for a larger variety of refreshments, indicating that while respondents would pay more for a longer event, they were unwilling to pay more for additional food options. Each of these scenarios yielded a significant result with p-values approaching zero; the same holds true for the subset of public sector respondents. This suggests that pricing decisions regarding training events depend less on the refreshments options and more on the length of training.

Table 5. Willingness to pay for training and meals.

Willingness to pay								
	Training		Breakfast		Lunch		Dinner	
	All ¹	Public Only ²	All ¹	Public Only ²	All ¹	Public Only ²	All ¹	Public Only ²
Mean	\$42.33	\$45.44	\$5.53	\$4.87	\$9.18	\$9.08	\$14.35	\$14.25
Median	\$50.00	\$50.00	\$5.00	\$10.00	\$10.00	\$10.00	\$15.00	\$15.00
Standard Deviation	\$26.51	\$26.20	\$2.04	\$1.73	\$2.38	\$2.26	\$3.72	\$3.82
Approx. 84%³	\$15.82	\$19.24	\$3.49	\$3.14	\$6.80	\$3.82	\$10.63	\$10.43
1- Columns labeled "ALL" show analysis based on all available data. 2- Columns labeled "Public Only" show analysis based on the subset of respondents who reported working in the public sector. 3- This measure was calculated by subtracting one standard deviation from the mean.								

Willingness to Pay for Meals

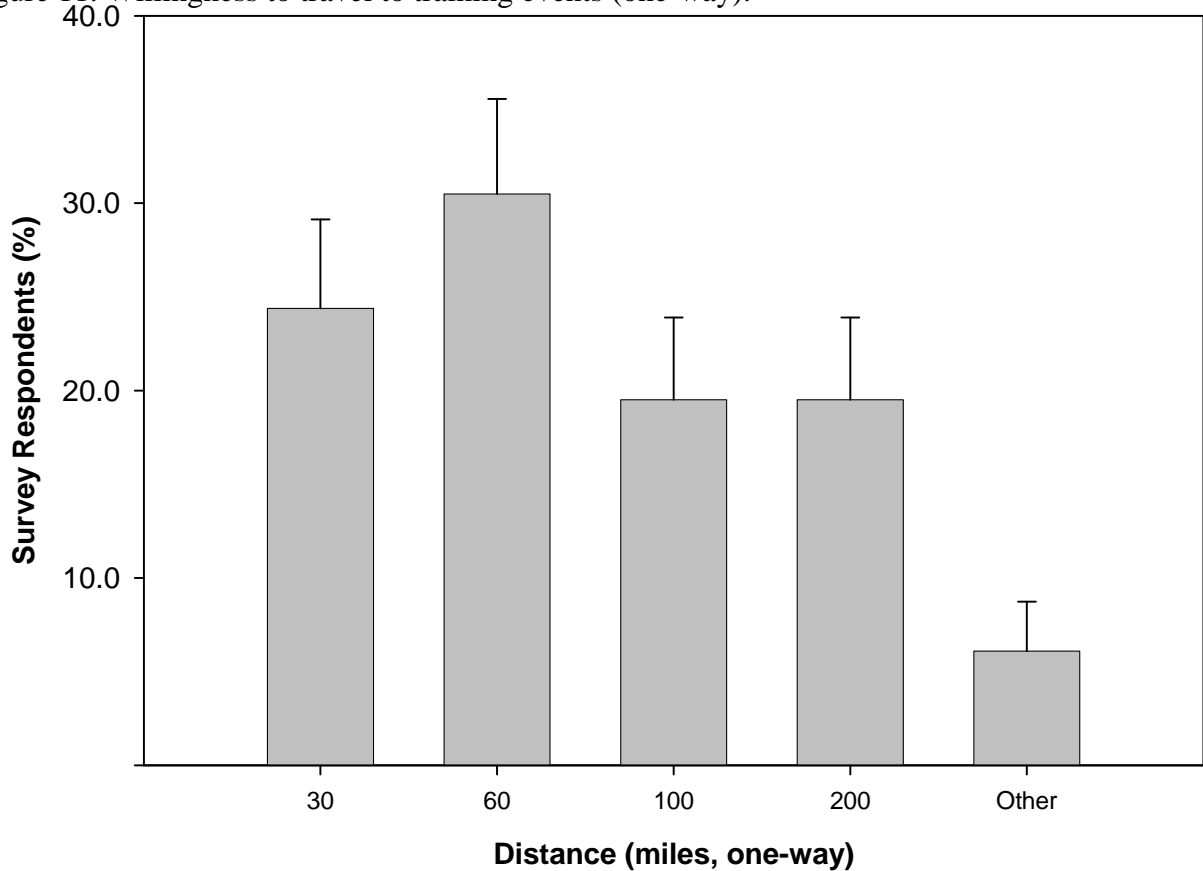
When asked how much they would be willing to pay for breakfast at the training, respondents answered that they would pay a mean average of \$5.53 for breakfast (Table 5). Assuming the data are normally distributed, an extrapolation of the data suggests that 84% of respondents would be willing to pay at least \$3.49 in addition to the training price for a breakfast (Public sector: \$3.14). Similar questions were asked for lunch and dinner. Respondents would pay a mean average of \$9.18 for lunch (Table 5). Assuming the data are normally distributed, an extrapolation of the data suggests that 84% of respondents would be willing to pay at least \$6.80, in addition to the training price, for lunch during training (Public sector: \$6.82). Respondents would also pay a mean average of \$14.35 for dinner (Table 5). Assuming the data are normally distributed, an extrapolation of the data suggests that 84% of respondents would be willing to pay at least \$10.63 in addition to the training price for dinner (Public sector: \$10.43). In issues involving cost, it is important to measure this willingness to pay in order to accommodate as many of the individuals as possible, to ensure participation in coastal training events.

Willingness to Travel

Another issue that could serve as a barrier to those attending training events is their willingness to travel. The primary facilities available to the Mission-Aransas NERR are located at the University of Texas Marine Science Institute. When asked about the maximum distance

they would be willing to travel to attend a full-day training event (one-way), 69.5% of the respondents reported a maximum willingness to travel of at least 60 miles (Figure 11). The mean response was 89.61 miles with a median response of 60 miles. Assuming the data are normally distributed, 84% of respondents were willing to travel 28 miles one-way to reach a training event (Public sector: 33 miles). This information will assist the CTP in selecting appropriate locations for training events and demonstrates the need to have access to additional training facilities.

Figure 11. Willingness to travel to training events (one-way).



Receipt of Correspondence and Materials

The final logistical detail that the survey explored was the method by which respondents prefer to receive correspondence. When asked how they would prefer to communicate with trainers, respondents overwhelmingly preferred to receive information via e-mail (91.5%). Respondents have a strong preference for receiving course-related materials via e-mail attachment (81.7%), although a group of respondents would prefer to receive materials via the United States (US) Postal Service (17.1%). The majority of respondents (93.9%) would prefer to register for events via the internet or e-mail. These results are mirrored by the subset of public sector respondents. These results for the general data set and the subset of the public sector suggest that while some instances may require the use of alternative contact methods, the use of e-mail and the internet to communicate with coastal decision-makers will satisfy the vast majority of individuals.

2.3.3 Analysis of Issue Ratings

Analysis of Full Set of Survey Respondents

The survey asked respondents to rate a series of issues based on their general knowledge, work-related experience, and perceived need for training. Within each of these three questions, the issues were divided into five categories: habitat, coastal management, planning/regulation, water/air, and resource management. Each category allowed the respondents to select from four possible ratings. For the general knowledge section, respondents were asked to describe their level of knowledge as: 1) expert, 2) knowledgeable, 3) some/limited knowledge, or 4) no knowledge. For the work-related experience section, respondents were asked to describe their experience as: 1) daily, 2) monthly, 3) annually, or 4) never. For the perceived need for training section, respondents were asked to describe their perception of the need of coastal decision-makers as: 1) essential, 2) important, 3) somewhat important, or 4) unimportant. Responses were assigned numerical values (0-3) to calculate a weighted average for comparison.

Respondents indicated they had the greatest general knowledge in issues of wetland protection and management, recreational uses, environmental impact assessments, water resources, and environmental monitoring (Table 6). This information is valuable in understanding the baseline level of knowledge when planning training events. These questions also identify potential training needs by indicating the current knowledge. For example, since sustainable building was rated low, this issue could be a good candidate for a training. Another option is advanced training events covering topics with high levels of general knowledge, such as wetland protection/management. The CTP will use this information to host more advanced training events for issues that rated highest and offer more introductory training events for those issues that rated lowest.

Table 6. Survey response from all participants to general knowledge of issues.

ALL RESPONDENTS – General Knowledge				
	Highest	Second Highest	Second Lowest	Lowest
Habitat	Wetland protection/management	Native species	Fire management	Streambank restoration
Coastal Management	Recreational use	Coastal and estuarine processes	Marina management	Port/harbor/planning/management
Planning/regulation	Environmental impact assessments	Regulatory compliance	Geographic information systems	Sustainable building, development, & industries
Water/Air	Water resources	Non-point source pollution	Combined sewer outflows	Thermal pollution
Resource Management	Environmental monitoring	Environmental education	Critical area delineation and management	Forestry issues

Respondents were also asked to consider their work-related experience for each issue. Respondents reported the highest levels of work-related experience in issues of wetland protection and management, recreational use, regulatory compliance, point source pollution and environmental

monitoring (Table 7). Responses of work-related experience were similar to those of general knowledge. This trend is expected, since people learn much of what they know through their profession; however, in some circumstances work-related experience differs from general knowledge. For instance, while water resources (supply and quality) was rated the highest issue in the water/air category for general knowledge, this issue rated below point source pollution in work-related experience. In this case, it is possible that more respondents handle point source pollution professionally and deal with water resources (supply and quality) more frequently in their personal lives. In general, training events focused on the relevancies of work-related experience may have a greater impact due to the professional involvement of many respondents in the coastal decision-making process.

Table 7. Survey response from all participants to work-related experience.

ALL RESPONDENTS – Work-Related Experience				
	Highest	Second Highest	Second Lowest	Lowest
Habitat	Wetland protection/ management	Native species	Streambank restoration	Fire management
Coastal Management	Recreational use	Coastal and estuarine processes	Port/harbor/ planning/management	Marina management
Planning/regulation	Regulatory compliance	Interagency coordination	Conservation land planning	Sustainable building, development, & industries
Water/Air	Point source pollution	Non-point source pollution	Combined sewer outflows	Thermal pollution
Resource Management	Environmental education	Erosion Control	Renewable energy	Forestry issues

The needs assessment survey also asked respondents to rate these issues based on their perceived need for training. Respondents indicated having the greatest perceived need for training of wetland protection and management, coastal zone management, regulatory compliance, water resources, and environmental education (Table 8). Comparisons can be drawn between the issue ratings for perceived need for training and issue ratings for general knowledge and work-related experience. For instance, although water resources (supply and quality) was not the highest rated water/air issue for work-related experience, it was the highest rated issue in this category for both general knowledge and perceived need for training. Thermal pollution rated the lowest water/air issue on all three rating iterations. This suggests that while respondents lack personal and professional knowledge in regard to thermal pollution, they do not consider this an issue of importance. The same might be said for fire management and streambank restoration, which were the two lowest rating habitat issues in all three questions.

Table 8. Survey response from all participants to perceived need for training.

ALL RESPONDENTS – Perceived Need for Training				
	Highest	Second Highest	Second Lowest	Lowest
Habitat	Wetland protection/ management	Habitat Restoration	Streambank restoration	Fire management
Coastal Management	Coastal zone management	Coastal erosion and accretion	Port/harbor/ planning/management	Marina management
Planning/regulation	Regulatory compliance	General land planning	Sustainable building, development, & industries	Geographic information systems
Water/Air	Water resources	Waste water management	Air emissions/ air quality	Thermal pollution
Resource Management	Environmental education	Erosion control	Mineral, oil, and natural gas extraction	Forestry issues

Average values of issues ratings in each category were compared to demonstrate categorical trends in responses. When considering their general knowledge, respondents rated habitat issues and coastal management issues the highest and resource management issues and planning/regulation issues the lowest (Table 9). None of these results are significant, although the habitat issues category was almost significant ($p \leq 0.0526$). While this information will not reveal which specific training would be successful, it is helpful to be aware that respondents consider their knowledge of habitat issues superior to resource management issues. As a result, the level of training events can be adjusted to the appropriate level for the audience.

Table 9. Average rating of issues from all participants by major category.

ALL RESPONDENTS – Average Issue Ratings by Category			
	General Knowledge	Work-Related Exp.	Perceived Need for Training
Habitat	1.62	1.75	2.16
Coastal Management	1.58	1.63	2.32
Planning/regulation	1.42	1.54	2.18
Water/Air Issues	1.47	1.55	2.08
Resource Management	1.41	1.51	2.08

The average ratings for work-related experience were higher than the ratings for general knowledge. Habitat issues and coastal management issues rated the highest, while planning/regulation issues and resource management issues rated the lowest. The only category for work-related experience to yield a significant result is the habitat category ($p \leq 0.0166$) suggesting that significant levels of professional expertise exist.

The average values for the perceived need for training were all higher than the average values indicated for general knowledge and work-related experience. The highest rated categories were coastal management and planning/regulation; the lowest rating categories were water/air and resource management. Interestingly, averages for all of these categories of perceived need for training were significant ($p \leq 0.0001$), therein demonstrating a large need for local training.

Analysis of the Subset of Public Sector Respondents

A subset of survey responses were analyzed for the public sector. The high diversity of respondents resulted in sample sizes that were too small to yield appropriate power for subgroup analysis. Given the importance of local government and the large numbers of public sector respondents, it was determined that further analysis of this group would provide valuable insight into the specific needs of the public sector as well allowing a comparison of the public sector data to the entire data set. Further information regarding local communities and organizations is included in the market analysis. Responses in the public sector had the greatest general knowledge in the issues of wetland protection and management, recreational uses, regulatory compliance, water resources, and environmental monitoring (Table 10). This information is valuable in understanding the baseline level of knowledge for public officials when planning training events. The only difference between this list of priority issues and the list for the entire data set is the increased knowledge of regulatory compliance. Issues with high ratings represent topics for more advanced and specialized training, while issues with low ratings might represent topics for introductory or intermediate training. For example, since general land planning rated relatively low for general knowledge among the public sector, this issue could be a good candidate for training.

Table 10. Survey response from the public sector to general knowledge of issues.

PUBLIC SECTOR RESPONDENTS – General Knowledge				
	Highest	Second Highest	Second Lowest	Lowest
Habitat	Wetland protection/management	Native species	Fire management	Streambank restoration
Coastal Management	Recreational use	Coastal and estuarine processes	Marina management	Port/harbor/planning/management
Planning/regulation	Regulatory compliance	Interagency coordination	Geographic information systems	General land planning
Water/Air	Water resources	Non-point source pollution	Air emissions/air quality	Thermal pollution
Resource Management	Environmental monitoring	Environmental education	Critical area delineation and management	Forestry issues

Respondents indicated that they had the greatest level of work-related experience with issues of wetland protection and management, native species, recreational use, interagency coordination, water resources, and environmental monitoring (Table 11). Work-related experience responses were similar to those of general knowledge. In general, training events focused on the relevancies of work-related experience may have a greater impact due to the professional involvement of many respondents in the coastal decision-making process.

Table 11. Survey response from the public sector to work-related experience.

PUBLIC SECTOR RESPONDENTS – Work-Related Experience				
	Highest	Second Highest	Second Lowest	Lowest
Habitat	Wetland protection/management	Native species	Streambank restoration	Fire management
Coastal Management	Recreational use	Coastal and estuarine processes	Port/harbor/planning/management	Marina management
Planning/regulation	Interagency Coordination	Regulatory compliance	Conservation Land Planning	Sustainable building, development, & industries
Water/Air	Water resources	Non-point source pollution	Air/emissions/air quality	Thermal pollution
Resource Management	Environmental monitoring	Environmental education	Mineral, oil, and natural gas extraction	Forestry issues

Respondents indicated that they had the greatest perceived need for training in wetland protection and management, coastal zone management, general land planning, water resources, and environmental education (Table 12). When compared to ratings for the entire data set, the public sector had lower rated level of general knowledge and a higher rated need for training in general land planning. This indicates a need for general land planning training events specifically for local governmental officials.

Table 12. Survey response from the public sector to for perceived need for training.

PUBLIC SECTOR RESPONDENTS – Perceived Need for Training				
	Highest	Second Highest	Second Lowest	Lowest
Habitat	Wetland protection/management	Habitat restoration	Streambank restoration	Fire management
Coastal Management	Coastal zone management	Coastal erosion and accretion	Salt water intrusion	Marina management
Planning/regulation	General land planning	Interagency coordination	Environmental impact assessments	Geographic information systems
Water/Air	Water resources	Non-point source pollution	Air/emissions/air quality	Thermal pollution
Resource Management	Environmental education	Environmental monitoring	Mineral, oil, and natural gas extraction	Forestry issues

Average ratings of issues in each category were compared to demonstrate categorical trends. When considering their general knowledge, public sector respondents rated coastal management issues and planning/regulation issues the highest and resource management issues and water/air issues the lowest (Table 13). In general, however, public sector respondents rated their general knowledge low in all categories producing a significant negative response (in each case $p \leq 0.0294$) except coastal management ($p \leq 0.0548$). While this information will not reveal which specific training would be successful, it is helpful to be aware that, for instance, respondents consider their knowledge of coastal management issues superior to resource management issues. As a result, the level of training events can be adjusted to the appropriate level for events directed toward the public sector.

Table 13. Average issue ratings by category among public sector respondents.

PUBLIC SECTOR RESPONDENTS – Average Issue Ratings by Category			
	General Knowledge	Work-Related Exp.	Perceived Need for Training
Habitat	1.29	1.04	1.84
Coastal Management	1.32	1.08	1.88
Planning/regulation	1.31	1.14	2.04
Water/Air Issues	1.20	0.85	1.84
Resource Management	1.14	0.89	1.73

Average ratings for work-related experience were generally lower than the ratings for general knowledge. This is a departure from the ratings for the entire data set; however, it is not surprising considering the breadth of issues that many public sector officials must address. In work-related experience, coastal management issues and planning/regulation issues rated the highest, while water/air issues and resource management issues rated the lowest. Each category that was averaged for the public sector responses had negative values in comparison to the range of ratings available (0-3). This result was different than the averages of the entire data set, which was positive.

Average values of perceived need for training from the public sector were also considered. These ratings were higher than the average values for both general knowledge and work-related experience. The highest rated subjects were coastal management issues and planning/regulation issues; the lowest rating subjects were water/air issues and resource management issues. Interestingly, averages for all categories, except habitat issues, were significant and demonstrate a strong need for training in the Coastal Bend (in each case $p \leq 0.0250$).

2.3.4 Follow-up Interviews

To further support the findings of the needs assessment survey, several follow-up interviews were performed. Subjects for these interviews were selected from the group of survey respondents in an effort to include responses from different counties and professions. Interviews included local and federal government officials, a contractor, a member of the local non-profit community, and a member of the ecotourism community for a total of six interviews. These interviews were designed to collect in-depth information about specific training needs beyond topical preferences such as

technical skills or management tools (Appendix 4). Respondents reported a variety of topics that represent primary needs for additional training effort, including climate change, sea level rise, water quality, ecosystem services, impacts of non-point source pollution, erosion control, bulkheading, permitting processes, and the impacts of urbanization and urban sprawl. Of these topics, water quality was mentioned by three of the six respondents, stressing the need for additional training in this subject.

Expanding upon the topical suggestions for training, the interview went on to ask participants to describe any technical skills that would be beneficial to them or other coastal decision-makers. Participants listed technical skills such as basic water quality sampling, bacterial source tracking, an update of research and methods for water quality sampling over the past five to ten years, ecosystem based management tools, the importance and use of metadata, understanding cumulative impacts, and basic modeling limitations and techniques. This set of technical skills further stresses the desire for more training involving water quality.

To approach the need for training from another direction, the interview asked participants to list any management tools that a workshop or training could help them understand or use. The list of management tools included climate change tools such as rolling easements or climate ready estuaries, best management practices for storm water, tools for saltwater intrusion, tools for nutrient control, conservation easements, development rules, permitting processes, coastal management, conservation, networking, and invasive species control. Four of the six participants listed at least one management tool related to coastal development, demonstrating a need for additional training in this area.

Participants were encouraged to provide comments throughout the interview. These comments varied widely but generally captured participant training preferences. Participants suggested that training topics including technical skills and management tools would depend widely on audiences. Key audiences described primarily included public officials. This included specific mention of elected positions with both county and municipal governments, city planning and permitting departments, regulatory agencies, and land owners. The emphasis on the public sector here supports the use of public sector respondents as a subgroup for this analysis. Participants also reaffirmed their preferences for small training events that last no more than one day. Interview responses captured a demand for the mixed use of class work and field work that includes both expert presentation and breakout groups. These preferences further reinforce the analysis of survey data relating to logistical preferences.

2.3.5 Assumptions and Limitations of Data

Survey Response Bias and Error

The data generated by the needs assessment survey relies on a number of assumptions. Studies that rely on survey instruments assume that the respondents are representative of the population. In this case, the population described is that of decision-makers in the Coastal Bend. While no evidence indicates that the survey missed a key group of individuals, some trends warrant discussion.

The survey data included a higher number of responses from coastal decision-makers in Aransas County and Nueces County than from the other counties in the Mission-Aransas NERR. While this is a concern, it is reasonable to assume that these counties exert a disproportionate influence on the Mission-Aransas Estuary due to the proximity of Aransas County and the high populations of Nueces County and Aransas County. Due their high populations, these counties support a higher number of coastal decision-makers than the other counties in the Mission-Aransas NERR. Based on the relative importance of these counties to the Mission-Aransas Estuary, this possible source of error has little impact on the interpretation of the results of the survey.

Another result that might signal an unrepresentative sample of coastal-decision makers was the percentage of respondents in the public sector versus those in the private sector. Even though over 60% of respondents identified themselves as public officials, this is still a representative sample. Public officials included three different subgroups: elected, appointed, and neither, while private sector respondents only included individuals representing for-profit and not-for-profit entities. While it was more difficult to obtain e-mail addresses for coastal decision-makers in the public sector, the development of the contact list for the survey made a specific point to include local public officials. Additionally, public officials have a higher likelihood of making decisions that directly impact the environmental conditions in the Mission-Aransas Estuary. The variety of respondents in the public sector may have exceeded 50%, but in this instance, public sector officials are the primary decision-makers in the Coastal Bend and this does not suggest an unrepresentative sample. This conclusion is supported by similarity between the response rates of the public and private sectors as well as the importance of the public sector expressed in the follow-up interviews.

The decision to utilize an electronic survey may have influenced survey results. Some individuals expressed having difficulty with the electronic format, so it is reasonable to assume that others struggled who did not express their difficulties. It is possible that technical difficulties could bias the data toward the responses from those more comfortable with e-mail and using internet resources such as the electronic survey. While this is an important possibility to consider, the developers were aware of this concern before survey distribution began. E-mail is a well accepted form of communication, so the use of this technology should not unduly influence the results. To reduce this potential source of error, the cover letter for each survey included contact information for the CTP Coordinator and instructions on how to easily request technical assistance or a hard-copy of the survey. Some subtle differences existed in the hard-copy survey in comparison to the electronic survey, although the effects of these differences are estimated as minimal. Only two hard-copy survey responses were received, thus greatly reducing the possible influence of these slight differences. As with all surveys, responses only represent the opinions of those who responded to the survey. However, responses collected from upwards of 100 coastal decision-makers is a large enough sample size to assume that general trends analyzed will reflect the trends actually occurring.

Changing Baseline Conditions

The results of the needs assessment survey are based on data collected in March through May of 2008. This information dates the data collected because it is dependent on the baseline conditions that existed at the time. A local political election occurred in the beginning of May, just as the survey period was closing, and none of the newly elected officials provided a survey response. Thus, the results reflect the opinions of those elected in the previous term.

In addition to the recent local elections, economic conditions have changed dramatically since the survey was closed. The most notable example of this change is the cost of energy. The price index for energy rose 4.4% in May of 2008 and rose an additional 6.6% in June (Bureau of Labor Statistics 2008). In June, the petroleum-based energy price index increased by 10.0%. Energy prices are embedded in many of the decisions that we make and can alter the decision making processes that goes into responding to the issues covered in the needs assessment survey. The market has also observed other increases in prices such as those for food. The food price index increased 1.0% in June. In fact, the price index for all items excluding food and energy event went up 0.3% in June (Bureau of Labor Statistics 2008). At this time, information is unavailable to quantify the effects of the shifting economic conditions into this analysis, but this information is important to consider when interpreting the findings of this document.

Survey Design

The survey design includes a number of benefits such as the quantity and diversity of information that it was designed to collect, but it was not without its drawbacks. The most noticeable drawback of the survey design was its length. Although only a 15 to 30 minute survey, this is a significant amount of time to ask for a respondents' careful attention. This causes fatigue in the respondents, can lead to an increase in erroneous responses in later survey questions, and can reduce the response rate of later survey questions. A total of 108 respondents started the survey but later questions intended for all respondents received as few as 82 responses. Additionally, a steady decline of responses can be observed throughout the survey. Each section received fewer responses than the previous section. While some of this decline might be attributable to technical difficulties encountered by respondents, it does not appear that all of the incomplete survey responses can be attributed to such difficulties. This suggests that some individuals demonstrated their survey fatigue by failing to complete surveys. In addition to the decreasing number of responses, several respondents criticized the length of the survey. This supports the claim that the length of the survey was difficult for some respondents. The only evidence available to demonstrate an increase in erroneous responses is the negatively sloping trend line of expertise for the five categories of issues. While the order to the individual issues was randomized within each of the five sections of environmental issues, the order of the groupings never shifted. Analysis revealed a negatively sloping trend line of ratings for each category in all three areas: general knowledge, work-related experience, and perceived need for training. While this could be a coincidence, it is possible that this is a reflection of fatigue in respondents due to the length of the survey.

Additional issues with survey questions including question type, answer choices, and vocabulary selections among others may have also impacted the responses to some extent, but there is no information to either confirm or deny these impacts at this time. It is clear that some error in the survey data exists, but the discussion above suggests that efforts were taken when possible to control for potential sources of error whenever possible to limit the impact of these errors in the final result.

2.4 Conclusions

This needs assessment is a detailed review of the survey data with information about training preference and respondents' evaluation of their general knowledge, work-related experience, and perceived need for training for a variety of coastal issues.

Preferences for training logistics were evaluated by survey respondents. Winter was identified as the preferred season for training while summer was the least preferred season for training. The survey did not reveal a significant preference for or against training events in the fall. Respondents demonstrated significant preferences for training events that last fewer than four hours and begin in the morning (8:00 AM to 11:00 AM). Although respondents agreed less on the ending time for events, they still indicated a significant preference for events that end in the afternoon (1:00 PM to 5:00 PM).

Based on these findings, the Mission-Aransas NERR should host training events primarily in the winter while providing training as needed in the spring and fall seasons. In general, training events in the summer months should be avoided when possible. Additionally, training events should begin in the morning at approximately 9:00 AM and continue no longer than one day. When possible, these events should be kept under four hours to encourage maximum participation from coastal decision-makers. Participants in follow-up interviews indicated a preference for events lasting no more than one day.

This needs assessment also presented information regarding meal and cost preferences. Findings suggest that respondents would be willing to pay a small fee not exceeding \$15 dollars. While the mean average value was \$42.33 for a one-day training event, this would still be more expensive than many respondents (~50%) would be willing to pay. It is important for the Mission-Aransas NERR to accommodate the majority of potential coastal decision-makers. Reducing fees as low as \$15 would accommodate approximately 84% of the respondents assuming normally distributed data. Analysis of a subset of data suggest that these figures also apply to those in the public sector.

In addition to the cost of the training itself, this needs assessment includes information about the meal preferences. Respondents were divided on whether to have meals catered on site or to have time allotted for attendees to go out for lunch while a much smaller group preferred to have the option to purchase a catered meal. The preference for going out to lunch received the highest percentage of response and was significant, and the on-site catered meal was also significant. Very few people would prefer to bring their own food and beverage to training events, indicating that events such as brown bag lunches should not be high priorities for the Mission-Aransas NERR CTP. The CTP Coordinator should evaluate the circumstances of the event to determine appropriate meal selections.

When meals are catered, prices should be kept low to encourage attendance. Breakfasts should cost no more than \$3.50, lunch should cost no more than \$7, and dinner should cost no more than approximately \$10.50. Assuming normally distributed data, each of these values will accommodate approximately 84% of respondents. As with any cost number, the current economic conditions will impact these prices to some extent and should be considered when evaluating pricing decisions. Additionally, some preference was indicated for training events to provide healthy eating options for attendees. The Mission-Aransas NERR should accommodate this desire whenever possible but should not increase the cost in order to do so. Analysis of a subset of data suggest that these figures apply to the public sector as well.

The willingness to travel is another important logistical factor for hosting training events. Using the same evaluation metric from the cost estimates, approximately 85% of respondents would be willing

to travel at least 28 miles one-way to attend a training event. While it may not always be possible to host a training within 28 miles of all desired attendees, efforts should be made whenever possible to take training events into local communities, to encourage participation. In planning events directed at public officials, training events should be hosted within 33 miles of all desired attendees. This need is increasingly true considering the increases in consumer pricing that have been observed since the survey was administered.

The needs assessment identified communication preferences for training event notifications. Respondents indicated a significant preference for electronic communication either through e-mail or the internet. This includes receiving information about training, receiving course-related training materials, and registering for training events. In all cases, electronic communication was preferred, although some individuals would still prefer to receive course-related materials via the US Postal Service. Interpretation of this result should include the caveat that since the survey was distributed electronically, this finding, in particular, may be somewhat skewed. As a result, efforts should be made whenever possible to accommodate those who prefer other means of communication or registration. Analysis of a subset of data suggest that these figures would apply specifically to the public sector as well.

In general, this document identifies a clear need for training in a variety of coastal and estuarine issues. One critical finding of this document is the need to take training events to local coastal decision-makers. The low number of responses from Refugio, San Patricio, and Calhoun counties coupled with the data regarding willingness to travel suggest that additional effort needs to be devoted to addressing the training needs of areas further from the Mission-Aransas NERR headquarters in Port Aransas, Texas. This clearly demonstrates the need for the Mission-Aransas NERR CTP to create an advisory committee and to continue to develop partnerships that will allow the Mission-Aransas NERR to expand training activities as indicated by respondents of the needs assessment survey.

The needs assessment indicated that training is needed at a variety of levels and in a variety of subject areas. Coastal decision-makers require training events as evidenced by the elevated ratings observed for the respondents' perceived need for training. This alone suggests a need for additional coastal training resources in the Coastal Bend.

The category that received the highest average for the perceived need for training was coastal management followed by planning/regulation issues. This suggests a perceived need for training in these areas, although it should not dissuade the hosting of training events in water/air or resource management issues. The need for training in these areas is supported by the fact that respondents rated their general knowledge and work-related experience for these issues as the lowest or second lowest of the five categories. It is possible that the lower perceived need for training observed in the survey responses for water/air issues or resource management issues is due to a lack of general knowledge or work-related experience and that these skills would be valuable for some coastal decision-makers in the Coastal Bend.

In regard to specific issues, the needs assessment indicates that the Mission-Aransas NERR should primarily focus training events on the top rated issues for perceived need for training, in habitat and planning/regulation (the top two rated categories): wetland protection/management, regulatory

compliance, habitat restoration, and general land planning. Additional training efforts should consider the issues ranking highest in the remaining categories: coastal zone management, water resources, environmental education, coastal erosion and accretion, wastewater management, and erosion control. These specific issues represent the top two rated issues for the perceived need for training identified in each of the five categories. The need for training in topics, skills, and tools relating to water quality and coastal development was supported by the results of several follow-up interviews to the needs assessment survey. Training events should focus on these issues while still addressing other training needs as they occur. Additional needs could occur based on changing economic or political conditions. For instance, the increase in energy costs might prompt an elevated demand for training events addressing renewable energy resources.

In addition to analysis of the entire data set, the subset of public officials was also analyzed. In many cases, answers from the public sector align very closely with those of the entire data set, although there are some differences. For instance, general land planning arose as an important issue with coastal decision-makers in the public sector, as demonstrated by the low levels of general knowledge and work-related experience and a high need for training. Additionally, there was a significant perceived need for training, which demonstrates that a CTP would be beneficial to the coastal decision-makers of the Coastal Bend.

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Numerous staff members within the Mission-Aransas NERR and UTMSI assisted in the research and composition of this document and the development of the needs assessment survey. Executive Director Georgia Neblett warrants specific recognition for her contributions to this document. Specific recognition goes to volunteer, Dick Mooers, who devoted much of his time to research that proved valuable to the completion of this document and the development of the survey distribution list. Recognition is also due to Education Coordinator Rick Tinnin, Research Coordinator Ed Buskey, Stewardship Coordinator Kiersten Madden, staff members Cammie Hyatt, Colt Cook, and volunteers Dave and Karen Sharbo for their assistance in survey development.

We would also like to acknowledge the support of all the coastal decision-makers who assisted this effort in any number of ways. This thanks extends to those who filled out surveys themselves, encouraged the response of additional individuals, or provided additional input through their survey comments or through other correspondence. Thanks is also due to the following people for participating in a follow-up interview for coastal training needs: Michael Kovacs (City of Port Aransas), Jace Tunnel (CBBEP), Chad Stinson (USFWS), Ward Ling (TCEQ), Terry Blankenship (Welder Wildlife Foundation), and Ken Lester (Lester Contracting Inc.). The participation of these coastal decision-makers and others was critical to the success of this endeavor.

We would also like to acknowledge the support of our Reserve Advisory Board who provided information regarding the training capabilities of their respective organizations: US Fish and Wildlife Service, GLO, TPWD, CBLT, CBBEP, the Nature Conservancy, the Fennessey Ranch, TxDOT, and the representative for the City of Rockport and Aransas County. In addition to those on the Reserve Advisory Board, information for this document was also provided by Selma Glascock (Welder Wildlife Foundation), Logan Respass (AES), Will Blackwell (NRCS), Carla Guthrie (TWDB), Liz Smith (TAMUCC), Lois Huff (CBBF), and Ward Ling (TCEQ).

Other valuable assistance was provided by individuals throughout the NERR System including Matt Chasse (Estuarine Reserves Division, National Oceanographic and Atmospheric Administration) and all the CTP Coordinators who provided examples of their planning documents or other information including Marian Hanisko (Grand Bay NERR), Jeffrey Pollack (North Inlet-Winyah Bay NERR), Rebekah Walter Szivak (ACE Basin NERR), Kathy Angel (Padilla Bay NERR), Chris Feurt (Wells NERR), and Lisa Auermuller (Jacques Cousteau NERR). Any others who may have provided assistance, thank you.

This document was prepared by Chad Leister and Sally Morehead. Advice, review, and recommendations were provided by Matt Chasse of the Estuarine Reserve Division, National Oceanographic and Atmospheric Administration.

5.0 Appendices

Appendix 1: Hard copy survey example.

THANK YOU FOR TAKING YOUR TIME TO RESPOND.

I know you are busy, but it should take no more than 30 minutes to complete this survey. Please read each question carefully. While some questions may appear to be similar, each question is designed to collect different information.

NO INDIVIDUALS WILL BE NAMED IN ANY REPORT RESULTING FROM THIS SURVEY; ALL PERSONAL INFORMATION WILL REMAIN CONFIDENTIAL.

The information from this survey will be used to help the Mission-Aransas National Estuarine Research Reserve's (Mission-Aransas NERR) Coastal Training Program (CTP) define both audiences and topics for future training activities for coastal decision-makers. The goal of this non-regulatory program is to perform long-term research in relatively natural settings. The program is administered through the National Oceanic and Atmospheric Administration and the University of Texas Marine Science Institute.

The Mission-Aransas NERR CTP presents an opportunity to establish and expand training partnerships between agencies, organizations, local governments, and educational institutions. The goal of the CTP is to provide a coordinated approach to coastal and environmental resource management training for individuals whose daily decisions, professional or volunteer, impact coastal watershed resources. The objective of the program is to assist these individuals, referred to throughout this document as "coastal decision-makers," in making informed decisions about coastal and watershed issues.

YOUR PARTICIPATION IN THIS SURVEY WILL HELP ME MEET LOCAL NEEDS BY FILLING GAPS IN EXISTING TRAINING EFFORTS, AVOIDING DUPLICATE TRAINING EFFORTS, CAPITALIZING ON PARTNERSHIP OPPORTUNITIES, AND FOCUSING ON THE ISSUES IDENTIFIED AS IMPORTANT TO YOU.

The survey contains 5 main sections:

1. General Information
2. General Knowledge Rankings
3. Work-Related Experience Rankings
4. Perceived Need for Training Rankings
5. Training Information and Specifics

There is also a field for general comments at the very end of the survey in case you have comments that will further help me define this program from your viewpoint. If you have any questions, I can be reached at (361) 749-6782 or cleister@mail.utexas.edu.

Thanks again,

Chad Leister

Coastal Training Program Coordinator
Mission Aransas National Estuarine Research Reserve

General Information

Name

Agency/Organization

Department

Job Title

Work Address

Phone Number

E-mail Address

Civic Involvement/Membership in Organizations and Boards

What county do you **live in**? (Circle one)

- a) Aransas
- b) Nueces
- c) Refugio
- d) San Patricio
- e) Calhoun
- f) Other_____

Are you responding to this survey based on your profession, other civic involvement as indicated above, or both? **Please answer the rest of the survey from this perspective.**

- a) Profession
- b) Other Civic Involvement
- c) Both

This is an important distinction, so if you would like to clarify your response, please do so below.

How long have you **lived in the Coastal Bend region of Texas?** (Circle one)

- a. 0-2 years
- b. 2-5 years
- c) 5-10 years
- d) 10+ years

How long have you **been with your agency/organization?** (Circle one)

- a) 0-2 years
- b) 2-5 years
- c) 5-10 years
- d) 10+ years

How long have you held your **present position within your agency/organization?** (Circle one)

- a) 0-2 years
- b) 2-5 years
- c) 5-10 years
- d) 10+ years

What, if any, continuing education or professional training opportunities have you taken advantage of in the past? (Please include relevant information)

Are you in the **public or private sector?** (Circle one)

- a) Public
- b) Private

If you are in the public sector, is your position **elected or appointed?** (Circle one)

- a) Elected
- b) Appointed
- c) Neither

If you are in the public sector, would you describe your position as **regulatory or non-regulatory?** (Circle one)

- a) Regulatory
- b) Non-regulatory

If you are in the private sector, is your organization **for profit or not for profit?** (Circle one)

- a) For profit
- b) Not for profit

3. Personal Experience with Coastal Issues

This section asks you to rank various coastal issues in five different categories based on your WORK-RELATED EXPERIENCE.

For the sake of this survey WORK-RELATED EXPERIENCE includes experience from BOTH YOUR PROFESSIONAL AND VOLUNTEER ACTIVITIES. This should include your involvement with local government, community organizations, or any activity that qualifies you as a coastal decision-maker. Each issue at left is followed by four different choices ranging from "Daily" to "Never."

If you are unsure about how to rank an issue or feel that your ranking falls between two choices please make the selection that BEST represents your WORK-RELATED EXPERIENCE for the listed issue. Also, please note that each issue requires a ranking in order for you to proceed.

Daily 1 2 3 4 Never

<u>Habitat Issues</u>
Biodiversity
Endangered/threatened species
Fire management
Habitat buffers
Habitat restoration
Invasive species
Native species
Protected/special area management
Streambank restoration
Wetland protection/management
Wildlife corridors
<u>Coastal Management</u>
Beach and nearshore ecology
Coastal Public Access
Coastal and estuarine processes
Coastal hazards
Coastal erosion and accretion
Coastal zone management
Dredging and filling
Fisheries management
Marina management
Port/harbor planning/management
Recreational use
Saltwater intrusion
Shoreline upland ecology
<u>Planning and Regulation Issues</u>
Conservation land planning
Environmental health
Environmental legislation
General land planning
GIS
Interagency coordination

Regulatory compliance
Sustainable industries and development
<u>Water/Air Issues</u>
Air emissions/Air quality
Combined sewer outflows
Eutrophication & nutrient loading
Ground water issues
Non-point source pollution
Point source pollution
Sedimentation
Septic system issues
Thermal pollution
Waste water management
Water resources (supply & quality)
<u>Resource Management Issues</u>
Agricultural issues/practices
Aquaculture/mariculture
Conservation technologies
Critical area delineation and
Ecological landscaping
Environmental education
Environmental monitoring
Erosion control
Estuarine ecology
Fisheries/by-catch issues
Fisheries and fishery law
Forestry issues
Global climate change/sea level rise
Mineral, oil, and natural gas extraction
Real estate issues
Renewable energy
Watershed management
<u>Other (Please specify)</u>

4. Perceived Needs for Coastal Training

This section asks you to rank various coastal issues in five different categories based on your PERCEIVED NEED FOR TRAINING.

For the sake of this survey PERCEIVED NEED FOR TRAINING should include YOUR TRAINING NEEDS AND THE TRAINING NEEDS OF OTHER COASTAL DECISION-MAKERS. Each issue at left is followed by four different choices ranging from "Essential" to "Unimportant." Please consider both existing training efforts (supply) and the relative importance of each issue (demand) in your rankings.

If you are unsure about how to rank an issue or feel that your ranking falls between two choices please make the selection that BEST represents your PERCEIVED NEED FOR TRAINING for the listed issue. Also, please note that each issue requires a ranking in order for you to proceed.

Essential 1 2 3 4 Unimportant

<u>Habitat Issues</u>	
	Biodiversity
	Endangered/threatened species
	Fire management
	Habitat buffers
	Habitat restoration
	Invasive species
	Native species
	Protected/special area management
	Streambank restoration
	Wetland protection/management
	Wildlife corridors
<u>Coastal Management</u>	
	Beach and nearshore ecology
	Coastal Public Access
	Coastal and estuarine processes
	Coastal hazards
	Coastal erosion and accretion
	Coastal zone management
	Dredging and filling
	Fisheries management
	Marina management
	Port/harbor planning/management
	Recreational use
	Saltwater intrusion
	Shoreline upland ecology
<u>Planning and Regulation Issues</u>	
	Conservation land planning
	Environmental health
	Environmental legislation
	General land planning
	GIS
	Interagency coordination
	Regulatory compliance
	Sustainable industries and development

<u>Water/Air Issues</u>	
	Air emissions/Air quality
	Combined sewer outflows
	Eutrophication & nutrient loading
	Ground water issues
	Non-point source pollution
	Point source pollution
	Sedimentation
	Septic system issues
	Thermal pollution
	Waste water management
	Water resources (supply & quality)
<u>Resource Management Issues</u>	
	Agricultural issues/practices
	Aquaculture/mariculture
	Conservation technologies
	Critical area delineation and
	Ecological landscaping
	Environmental education
	Environmental monitoring
	Erosion control
	Estuarine ecology
	Fisheries/by-catch issues
	Fisheries and fishery law
	Forestry issues
	Global climate change/sea level rise
	Mineral, oil, and natural gas extraction
	Real estate issues
	Renewable energy
	Watershed management
<u>Other (Please specify)</u>	

5. Training Preferences and History

Consider allotting enough time to cover a topic and your time constraints, what is your preferred length of training session?

- a) 1 – 2 hours
- b) 2-4 hours
- c) Full-day (8 hours)
- d) Two-day (16 hours)
- e) Other (please specify) _____

What time of day would you prefer to *begin* a training session? (Circle all that apply)

- a) Morning (Between 8 AM and 11 AM)
- b) Midday (Between 11 AM and 1 PM)
- c) Afternoon (Between 1 PM and 5 PM)
- d) Evening (Between 5 PM and 8 PM)

What time of day would you prefer to *finish* a training session? (Circle all that apply)

- a) Morning (Between 9 AM and 11 AM)
- b) Midday (Between 11 AM and 1 PM)
- c) Afternoon (Between 1 PM and 4 PM)
- d) Evening (Between 5 PM and 9 PM)

What is your preferred season(s) for training events? (Circle all that apply)

- a) Winter
- b) Spring
- c) Summer
- d) Fall

How much would you be willing to pay for a full day training event that included an out-of-town speaker and refreshments such as coffee, tea, water, and cookies? (Circle one)

- a) \$10
- b) \$25
- c) \$50
- d) \$100
- e) Other(please specify) _____

Would this value fluctuate depending on the length of the training event? (Circle one)

- a) Yes, I would pay more/less for a longer/shorter training event
- b) No, A training event should cost the same regardless of length

If yes, please briefly describe how much more/less you would pay for various training lengths.

Would this value fluctuate depending on the variety of refreshments provided? (Circle one)

- a) Yes, I would pay more for a larger variety of refreshments
- b) No, I would be content with the selection of refreshments described above

If yes, please describe how more you would be willing to pay and your preferred options.

What would be your meal preference for a full-day/multi-day training event? (Circle one)

- a) I would prefer to bring my own food and beverage (to reduce cost or meet dietary restrictions)
- b) I would prefer to have meals catered at the training site and included in the training price
- c) I would prefer to have the option of purchasing a meal catered on-site in advance
- d) I would prefer to have time allotted so that attendees could go out to lunch

If you would like to have meals included in training fees or to have that option, how much more would you be willing to pay for a breakfast? (Circle one)

- a) \$2
- b) \$5
- c) \$7
- d) \$10
- e) Other (please specify) _____

If you would like to have meals included in training fees or to have that option, how much more would you be willing to pay for a lunch? (Circle one)

- a) \$5
- b) \$7
- c) \$10
- d) \$15
- e) Other (please specify) _____

If you would like to have meals included in training fees or to have that option, how much more would you be willing to pay for a dinner? (Circle one)

- a) \$7
- b) \$10
- c) \$15
- d) \$20
- e) Other (please specify) _____

What is the *maximum* distance that you would be willing to travel to attend a full-day training event? (Circle one)

- a) 30 miles
- b) 60 miles
- c) 100 miles
- d) 200 miles
- e) Other (please specify) _____

How would you prefer to communicate with trainers? (Circle one)

- a) Via US Mail Service
- b) Via Telephone
- c) Via E-mail
- d) Other (please specify) _____

How would you prefer to receive any course-related materials? (Circle one)

- a) Via US Mail Service
- b) Via Fax
- c) Via E-mail
- d) Other (please specify) _____

How would you prefer to register for training events? (Circle one)

- a) Via US Mail Service
- b) Via the internet
- c) Via e-mail
- d) Via telephone
- e) Other (please specify) _____

Is there anything else regarding the specifics and logistics of a training event that you would like to comment on, expand upon, or describe for us?

Would you be willing to partner with the Mission-Aransas NERR in order to increase the amount of training available in the Coastal Bend region? Would you be able to offer any resources such as materials, personnel, transportation, speakers, financial support, or meeting facilities toward such a partnership?

Does your organization provide training, outreach, science-based information, or some other educational product or service related to the coastal environment? (Choose all that apply)

- a. Yes, we provide trainings (workshops, seminars, conferences, etc.)
- b. Yes, we provide outreach (webpage, newsletter, brochures, etc.)
- c. Yes, we provide science based information (reports and technical documents)
- d. No, we do not provide training, outreach or educational materials.

How many coastal training opportunities has your agency/organization provided (hosted, funded or otherwise supported) over the past 5 years? (Please describe briefly)

- a. 1-2
- b. 3-5
- c. 6-10
- d. 11-20
- e. 20+

How many of these opportunities were offered jointly through a partnership with another agency/organization? (Please describe briefly)

- a. 1-2
- b. 3-5
- c. 6-10
- d. 11-20
- e. 20+

Where were these trainings held? (Please list city or town and specific location if possible)

Who was the target audience of the training? _____

Other Comments: _____

Thank you very much for your time and effort. We would like to remind you that your specific answers are confidential and you will not be identified by name in any report. If you have any questions, please feel free to contact Chad Leister at (361) 749-6782 or cleister@mail.utexas.edu.

Appendix 2: Example cover letter sent out with survey.

Dear Head of Local Government,

Head of Local Government, I need your help. The Mission-Aransas National Estuarine Research Reserve (Mission-Aransas NERR) is dedicated to providing relevant information and training to guide your adopted policies in serving the greater needs of your elected responsibility. In order to facilitate this process, I would appreciate it if you would take some of your valuable time to answer a survey that should take no more than 30 minutes to complete. It is important to learn from people of your stature what is germane and this survey is designed to provide that data.

Please click on the survey link below:

[Mission-Aransas NERR Needs Assessment Survey](#)

If you do not have access to the internet, have trouble accessing the link, or prefer to fill out a paper copy, please contact me at (361) 749-6782 or cleister@mail.utexas.edu and I will be happy to assist you in troubleshooting or by providing a paper copy.

I know how many requests you receive for your time and I thank you for this effort on my behalf. I am sure that the data collected in this survey will prove valuable in developing a series of training opportunities that specifically address topics and issues of great importance to you and your local community. I would gladly receive any of your comments regarding the survey or this process.

Sincerely,
Chad Leister
Coastal Training Program Coordinator

Appendix 3: Example reminder letter.

Dear _____,

I need your help. I sent you an e-mail on _____ with a link to an electronic Needs Assessment Survey that seeks input for training efforts in the Coastal Bend. I really need your opinions in order to allow this survey to be used for program development for the Coastal Training Program of the Mission-Aransas National Estuarine Research Reserve (NERR). Your time is valuable and I recognize that the survey seems lengthy, but it should take you no more than 30 minutes to complete; many respondents finished in as few as 15 minutes. I would also like to remind you that all responses are confidential and no one will be named in any resulting report.

Response rate is a very important factor for this study. A high percentage of response is a requirement for this survey. This is my first major task as Coastal Training Program Coordinator for the Mission-Aransas NERR and each additional response will improve my chances of success in this endeavor. I am required to report my initial findings including the response rate by May 15. So, I would appreciate it if you could devote a few minutes of your time to complete my Needs Assessment Survey.

For your convenience, I have included the survey link below:
[Mission-Aransas NERR Needs Assessment Survey](#)

As previously, if you do not have access to the internet, have trouble accessing the link, or prefer to fill out a paper copy, please contact me at (361) 749-6782 or cleister@mail.utexas.edu and I will be happy to assist you by troubleshooting or providing a paper copy. I would gladly receive any of your comments regarding the survey or this process.

Thanking you in advance for being willing to devote some of your important time toward this worthwhile task that is so important to me.

Sincerely,
Chad Leister
Coastal Training Program Coordinator

Appendix 4: Follow-up interview template and questions.

1. Thank individuals for completing the survey.
2. Explain why we are following up, time line, agree to send copies of the final versions.
3. Explain or review results if requested.
4. Ask follow-up questions
 - If the Mission-Aransas NERR could host a workshop/training covering any one topic, what topic would you choose? Why? What format would the training take? Who would be the target audience?
 - Are there any technical skills that you would like to see a workshop of training cover? Why? What format would the training take? Would this be a field exercise (outdoors) or indoors? Who would be the target audience?
 - Are there any management tools that a workshop could help you understand or use? Why? What format would this workshop take? Who would be the target audience?
 - Are there important audiences for CTP to incorporate that have yet to be included?
 - Did you attend the Coastal Community Planning and Development Workshop hosted by the Mission-Aransas NERR in June? If so, how have you used the information, tools, and skills from the event? What results of outcomes from the event have you observed in your community?
<results not included in this document>

APPENDIX B

LIST OF COASTAL TRAINING PROGRAM PARTNERS

Matrix of CTP Partners and Priority Issue Areas

This matrix highlights the partnerships that make up the Coastal Training Program. Partnerships that are indicated as “Current” are involved in CTP events either currently or in the recent past. Partners that are indicated as “Near-term Anticipated” are current partnerships that will either be strengthened within the next year, or new partners that are involved in anticipated CTP events for the year of 2015. Partners that are indicated as “Future Anticipated” are partnerships that CTP will work to have in place by 2020.

Agency/Entity	Priority Audience	Priority Issue Area	Current or Anticipated
Aransas County	Local Community Elected/Appointed Officials	Coastal access; coastal community resilience and hazard mitigation; stakeholder communication and engagement tools	Current
Aransas National Wildlife Refuge	Coastal Resource Management	Habitat conservation and coastal restoration; climate change impacts on natural systems; coastal community resilience and hazard mitigation	Current; Near-Term Anticipated
City of Aransas Pass	Local Community Elected/Appointed Officials	Coastal community resilience and hazard mitigation; coastal access; stakeholder communication and engagement tools	Current; Near-Term Anticipated
City of Corpus Christi	Local Community Elected/Appointed Officials	Coastal community resilience and hazard mitigation; coastal access	Current
City of Port Aransas	Local Community Elected/Appointed Officials	Coastal community resilience and hazard mitigation; coastal access; stakeholder communication and engagement tools	Current, Near-Term Anticipated
City of Portland	Local Community Elected/Appointed Officials	Coastal community resilience and hazard mitigation; coastal access	Future Anticipated
City of Refugio	Local Community Elected/Appointed Officials	Coastal access; habitat conservation and coastal restoration	Future Anticipated
City of Rockport	Local Community Elected/Appointed Officials	Coastal community resilience and hazard mitigation; coastal access; stakeholder communication and engagement tools	Current

Agency/Entity	Priority Audience	Priority Issue Area	Current or Anticipated
Coastal Bend Bays Foundation	Coastal Resource Management	Coastal community resilience and hazard mitigation; coastal access	Current; Near-Term Anticipated
Coastal Bend Bays and Estuaries Program	Coastal Resource Management	Habitat conservation and coastal restoration; stakeholder communication and engagement tools	Current; Near-Term Anticipated
Conrad Blucher Institute, Texas A&M University – Corpus Christi	University/Academic Research	Stakeholder communication and engagement tools; climate change impacts on natural systems	Current
Harte Research Institute, Texas A&M University – Corpus Christi	University/Academic Research	Habitat conservation and coastal restoration; stakeholder communication and engagement tools	Current
Nueces County	Local Community Elected/Appointed Officials	Coastal community resilience and hazard mitigation; coastal access; stakeholder communication and engagement tools; climate change impacts on natural systems	Current; Near-Term Anticipated
San Antonio Bay Partnership	Coastal Resource Management	Climate change impacts on natural systems; habitat conservation and coastal restoration	Current
San Antonio Bay Foundation	Coastal Resource Management	Climate change impacts on natural systems; habitat conservation and coastal restoration	Current
San Antonio River Authority	Coastal Resource Management	Climate change impacts on natural systems; habitat conservation and coastal restoration	Current; Near-Term Anticipated
Texas A&M AgriLIFE Extension	University/Academic Researcher; Extension and Outreach	Habitat conservation and coastal restoration; stakeholder communication and engagement tools	Current
Texas Department of Transportation	Coastal Resource Management	Coastal community resilience and hazard mitigation	Current
Texas Floodplain Management Association	Coastal Resource Management	Coastal community resilience and hazard mitigation	Future Anticipated

Agency/Entity	Priority Audience	Priority Issue Area	Current or Anticipated
Texas General Land Office Coastal Management Program	Coastal Resource Management	Coastal access; coastal community resilience and hazard mitigation	Current; Near-Term Anticipated
Texas General Land Office Oil Spill Division	Coastal Resource Management	Coastal community resilience and hazard mitigation	Near-Term Anticipated
Texas Parks and Wildlife Department	Coastal Resource Management	Habitat conservation and coastal restoration; climate change impacts on natural systems; stakeholder communication and engagement tools	Current
Texas Sea Grant	University/Academic Researcher; Extension and Outreach	Coastal community resilience and hazard mitigation	Current
The Nature Conservancy	Natural Resource Manager	Coastal community resilience and hazard mitigation; coastal restoration; freshwater inflows; water quality monitoring	Current
Town of Fulton	Local Community Elected/Appointed Officials	Coastal community resilience and hazard mitigation	Current
U.S. Coast Guard – Sector Corpus Christi	Coastal Resource Management	Coastal access; coastal community resilience and hazard mitigation	Current
U.S. Fish and Wildlife Service	Coastal Resource Management	Habitat conservation and coastal restoration; climate change impacts on natural systems; stakeholder communication and engagement tools	Current

APPENDIX C

COSTAL TRAINING PROGRAM ADVISORY COMMITTEE MEMBERS

CTP Advisory Board Members

The following is a list of the members of the Advisory Board for the Mission-Aransas CTP. This Advisory Board is newly formed and does not have an as-yet formed charter or roles and responsibilities, beyond providing input on CTP activities. This is a priority for the next Advisory Board meeting.

Name	Title	Organization
Scott Cross	Director of Coastal Parks	Nueces County
Patrick Rios	Mayor Pro Tem/City Council Ward 3	City of Rockport
Billy Delgado	Emergency Management Coordinator	City of Corpus Christi
Jeffrey Pollack	Environmental Specialist	Corpus Christi Metropolitan Planning Organization
Craig Davis	Beach Watch Coordinator	Texas General Land Office Coastal Management Program
Rhonda Cummins	Extension Agent	Coastal and Marine Resources - Calhoun County Texas Sea Grant
Amanda Torres	Administrative Assistant	City of Aransas Pass
Ginger Easton-Smith	Coastal County Extension Agent – Agriculture and Natural Resources	Texas A&M AgriLIFE Extension – Aransas County
Lieutenant Commander Nathan Allen	Planning Department Head	U.S. Coast Guard Sector Corpus Christi
Art Morris	Coastal Fisheries Division Outreach Specialist for Lower Texas Coast	Texas Parks and Wildlife Department
Leo Trevino	Deputy Executive Director	Coastal Bend Bays & Estuaries Program
Richard McLaughlin	Endowed Chair for Marine Policy and Law	Harte Research Institute

APPENDIX D

MEMORANDUM OF UNDERSTANDING BETWEEN NOAA AND UTMSI

Memorandum of Agreement
Between the
National Oceanic and Atmospheric Administration
And the
The University of Texas at Austin
Detailing the state-federal roles in the
Management of the Mission-Aransas
National Estuarine Research Reserve

This Memorandum of Agreement states the provisions for the cooperative management of the Mission-Aransas National Estuarine Research Reserve in the state of Texas, between the University of Texas at Austin and the National Oceanic and Atmospheric Administration's Office for Coastal Management.

I. BACKGROUND

- A. The state of Texas has determined that the waters and related coastal habitats of Mission-Aransas Estuary (MAE) provide unique opportunities for study of natural and human processes to contribute to the science of estuarine ecosystem processes, enhance environmental education opportunities, and provide scientific information for effective coastal zone management in the state of Texas.
- B. The state of Texas has determined that the resources of the Mission-Aransas NERR and the values they represent to the citizens of Texas and the United States will benefit from the management of these resources as part of the National Estuarine Research Reserve System.
- C. The National Oceanic and Atmospheric Administration has concurred with that finding and, pursuant to its authority under Section 315 of the Coastal Zone Management Act of 1972, as amended (CZMA, 16 U.S.C. § 1461), and in accordance with implementing regulations at 15 C.F.R. § 921.30, has designated the Mission-Aransas NERR.
- D. The University of Texas at Austin, as the agency designated by the Governor of Texas is responsible for maintaining and managing the Mission-Aransas NERR in accordance with Section 315 of the CZMA and acknowledges the value of state-federal cooperation for the long-term management of the reserve in a manner consistent with the purpose of its designation.
- E. The Mission-Aransas NERR management plan, approved by NOAA, describes the goals, objectives, strategies/actions, administrative structure, and institutional arrangements for the reserve, including this MOA and others. In consideration of the mutual agreements herein, NOAA and The University of Texas at Austin agree to the following roles indicated in Section II of this agreement.

II. STATE-FEDERAL ROLES IN RESERVE MANAGEMENT

A. The University of Texas at Austin Role in Reserve Management

The University of Texas at Austin shall:

1. be responsible for compliance with all federal laws and regulations, and ensure that the Mission-Aransas NERR management plan is consistent with the provisions of the CZMA and implementing regulations;
2. ensure protection of the natural and cultural resources of the reserve, and ensure enforcement of the provisions of state law, including rules and regulations of the Texas Coastal Management Program;
3. ensure adequate, long-term protection and management of lands and waters included within the reserve boundary;
4. apply for, budget, allocate, and expend funds in accordance with federal and state laws, the reserve management plan, and annual funding guidance for reserve operations, research and monitoring, education and stewardship, and, as necessary, land acquisition and reserve facility construction;
5. conduct and coordinate research and monitoring programs that encourage scientists from a variety of institutions to work together to understand the ecology of the reserve ecosystem to improve coastal management;
6. conduct and maintain programs that disseminate research results via materials, activities, workshops, and conferences to resource users, state and local agencies, school systems, general public, and other interested parties;
7. provide staff and endeavor to secure state funding for the manager, education coordinator, and research coordinator;
8. secure facilities and equipment required to implement the provisions within the reserve management plan;
9. ensure adequate funding for facilities operation and maintenance;
10. maintain effective liaison with local, regional, state, and federal policy makers, regulators and the general public;
11. serve as principal contact for issues involving proposed boundary changes and/or amendments to the reserve management plan; and

12. respond to NOAA's requests for information made pursuant to Section 312 of the CZMA, particularly cooperative agreement and grant progress reports and evaluation findings, including necessary actions and recommendations.

B. Federal Role in Reserve Management

NOAA's Office for Coastal Management shall:

1. administer the provisions of the Sections 315 and 312 of the CZMA to ensure that the reserve operates in accordance with goals of the reserve system and the Mission-Aransas NERR management plan;
2. review and process applications for financial assistance from the University of Texas at Austin, consistent with 15 C.F.R. § 921, for management and operation, and, as appropriate, land acquisition and facility construction;
3. advise the University of Texas at Austin of existing and emerging national and regional issues that have bearing on the reserve and reserve system;
4. maintain an information exchange network among reserves, including available research and monitoring data and educational materials developed within the reserve system;
5. to the extent possible, facilitate the allocation of NOAA resources and capabilities in support of reserve goals and programs.

C. General Provisions

1. Nothing in this agreement or subsequent financial assistance awards shall obligate either party in the expenditure of funds, or for future payments of money, in excess of appropriations authorized by law.
2. Upon termination of this agreement or any subsequent financial assistance awards to University of Texas at Austin, any equipment purchased for studies to further this agreement will be disposed of in accordance with 15 C.F.R. § 24.32.
3. A free exchange of research and assessment data between the parties is encouraged and is necessary to ensure success of cooperative studies.

D. Other Provisions

1. Nothing in this agreement diminishes the independent authority or coordination responsibility of either party in administering its respective statutory obligations. Nothing in this agreement is intended to conflict with current written directives or policies of either party. If the terms of this agreement are inconsistent with existing written directives or policies of either party entering this agreement, then those portions of the agreement which are determined to be inconsistent with such written directives and

policies shall be invalid; but the remaining terms not affected by the inconsistency shall remain in full force and effect. At the first opportunity for revision of this agreement, all necessary changes shall be made by either an amendment to this agreement or by entering in a new superseding agreement, whichever is deemed expedient to the interested parties. Should disagreement arise on the interpretation of the provisions and/or amendments of this agreement, such disagreement shall be resolved by negotiations at the operating level of each party.

III. REAL PROPERTY ACQUIRED FOR PURPOSE OF THE RESERVE

As well as acknowledging the rest of the requirements set forth at 15 C.F.R. § 921, University of Texas at Austin specifically acknowledges and will fully comply with conditions set forth at 15 C.F.R. § 921.21 (e), which specify the legal documentation requirements concerning the use and disposition of real property acquired for reserve purposes with federal funds under Section 315 of the CZMA.

IV. PROGRAM EVALUATION

The Office for Coastal Management of NOAA will schedule periodic evaluations of University of Texas at Austin performance in meeting the terms of this agreement, financial assistance awards, and the reserve management plan. Where findings of deficiency occur, NOAA may initiate action in accordance with the designation withdrawal or interim sanctions procedures established by the CZMA and applicable regulations at 15 C.F.R. § 921.40-41.

V. EFFECTIVE DATE, REVIEW, AMENDMENT AND TERMINATION

- A. This agreement is effective on the date of the last signature on this agreement and shall be in effect until terminated by either party.
- B. This agreement will be reviewed periodically by both parties and may only be amended by the mutual written consent of both parties.
- C. This agreement may be terminated by mutual consent of both parties, or by NOAA if NOAA withdraws designation of the reserve within the reserve system, pursuant to applicable provisions of the CZMA and its implementing regulations as described under 15 C.F.R. § 923 Subpart L, or if NOAA finds that University of Texas at Austin fails to comply with this MOA. Should this agreement be terminated, reimbursement of unexpended funds from financial assistance awards shall be determined on a pro rata basis according to the amount of work done by the parties at the time of termination. Additionally, reimbursement for land purchased and facilities constructed with NOAA funds shall be consistent with terms and special award conditions of financial assistance awards.
- D. If any clause, sentence or other portion of this MOA shall become illegal, null, or void for any reason, the remaining portions of this MOA shall remain in full force and effect.
- E. No waiver of right by either party of any provision of this MOA shall be binding unless expressly confirmed in writing by the party giving the waiver.

IN WITNESS THEREOF, the parties have caused this agreement to be executed.

Jeff Payne
Acting Director
Office for Coastal Management
National Ocean Service
National Oceanic and
Atmospheric Administration
U.S. Department of Commerce

Date

Linda A. Hicke, Ph.D.
Dean
College of Natural Sciences
The University of Texas at Austin

Date

Robert W. Dickey, Ph.D.
Director
University of Texas Marine Science
Institute

Date

APPENDIX E

**MEMORANDUM OF UNDERSTANDING BETWEEN UTMSI, GLO,
USFWS, CBLT, FENNESSEY RANCH, TPWD, TXDOT, CBBEP,
ACND, ARANSAS COUNTY, AND THE CITY OF ROCKPORT**

MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding (MOU) serves to establish the contractual framework for coordination, cooperation, collaboration, and communication regarding the Mission-Aransas National Estuarine Research Reserve (Reserve) among the following twelve parties (parties-in-interest): The University of Texas at Austin (The University), a state institution of higher education and a component of The University of Texas System serving as the state lead entity; Texas General Land Office, Texas Parks and Wildlife Department, Texas Department of Transportation, U.S. Fish and Wildlife Service, The Nature Conservancy, Coastal Bend Land Trust, Coastal Bend Bays and Estuary Program, Fennessey Ranch, the Aransas County Navigation District, the City of Rockport, and Aransas County. Subject to the MOU's below-conditions, this MOU is a binding contract that is entered into by the parties-in-interest.

WHEREAS, the State of Texas (Texas) has received a grant (Grant) from the United States Department of Commerce (DOC), National Oceanic and Atmospheric Administration (NOAA) for the development and operation of certain portions of the Mission-Aransas Estuary (MAE), described below in Attachment A, as the Mission-Aransas National Estuarine Research Reserve (Reserve), and

WHEREAS, the purpose of the DOC grant is to create new opportunities for coordinated MAE coastal resource management, research, monitoring, stewardship, and public education (Program), and

WHEREAS, such Program has wide public support, as evidenced by the implementation of the Coastal Bend Bays Plan, the Mission-Aransas Watershed Wetland Conservation Plan, the Seagrass Conservation Plan, and

WHEREAS, the parties-in-interest have evidenced support for such a Program through their approval of the 2004 Site Nomination Proposal for the Reserve,

NOW THEREFORE, in consideration of the mutual covenants and agreements contained in this MOU as well as the mutual benefits to be derived from implementing this Program, the parties-in-interest agree to the following:

1. The lands described in Attachment A (attached to this MOU and incorporated into this MOU by this reference) are designated as sites participating in the Reserve.
2. There is a program management plan (Plan) for the Reserve that provides a framework for conducting a specified Program on Reserve sites (Attachment B). Revisions of the Plan shall be developed by the Reserve staff and reviewed by an advisory board (Board) composed of the parties-in-interest, as

defined in Article 6a. The Plan shall be reviewed every five (5) years and revised in consultation with the Board and NOAA.

3. A primary purpose of the Program is to provide funding, staff, and other resources and guidance that will assist Reserve land managing entities to develop site-specific activities that are consistent with the Plan. This Program will focus on identifying and conserving sensitive ecological resources, promoting on-site research and long term monitoring, engaging local communities in stewardship activities that support the conservation of sensitive reserve resources, and acting as a regional educational resource that serves the public of the MAE region.
4. Parties-in-interest agree to exert their reasonable best efforts to support the implementation of the Plan. Nothing in this MOU diminishes the independent authority or coordination responsibility of any party-in-interest in administering its respective statutory and legal obligations. Nothing in this MOU is intended to conflict with current written directives or policies of any party-in-interest. If the terms of this MOU are inconsistent with existing written directives or policies of any party-in-interest entering into this MOU, then those portions of the MOU that are determined to be inconsistent with such written directives and policies shall be invalid; but the remaining terms not affected by the inconsistency shall remain in full force and effect. At the first opportunity for revision of this MOU, all necessary changes will be made by either an amendment to this MOU or by entering into a new superseding MOU, whichever is deemed expedient to the interest of all parties. Issues that arise that may be contrary to the terms or intent of the Plan will be brought to the Board for discussion and resolution by consensus or majority vote of its members. Should disagreement arise on decisions of the Board or in the interpretation of the provisions of this MOU, or amendments and/or revisions to the MOU, that cannot be resolved by negotiations at the operating level of each party-in-interest, the area(s) of disagreement shall be stated in writing by each party-in-interest and promptly presented to a unanimously approved mediator for non-binding mediation. If the parties-in-interest cannot agree on the choice of a mediator or if the mediation does not resolve the dispute to the unanimous approval of the parties-in-interest, the parties-in-interest are free to pursue any other legal remedies that are available or to terminate their participation in this MOU.
5. Multiple uses of Reserve lands are encouraged to the extent that such uses are compatible with the Program and its purpose as expressed in the Plan. Oil and gas activities are an existing and traditional use that will continue to occur and be regulated by State law. The parties-in-interest having jurisdiction over the Reserve site (or sites) will exert their reasonable best

efforts to ensure uses or levels of use are consistent with the goals of the Plan.

6. Management Structure

- a. Board membership. The Board shall be comprised of members from the parties-in-interest. The Texas General Land Office shall have one representative from each of three divisions that have direct interest in the Reserve: Coastal Resources, Energy Resources, and Professional Services. The University, Texas Parks and Wildlife Department, Texas Department of Transportation, U.S. Fish and Wildlife Service, The Nature Conservancy, Coastal Bend Land Trust, Coastal Bend Bays & Estuary Program, and Fennessey Ranch. To provide an appropriate linkage to the broader community so the Reserve reflects the concerns and ideas of this regional constituency, the Aransas County Navigation District and the City of Rockport shall also each have one representative on the Board. Board terms shall be of three years duration, commencing on (date) and ending three years thereafter. Members of the Board will serve without compensation from the Reserve.
- b. Board role. The Board shall represent the agencies/entities having jurisdiction over sites comprising the Reserve. The Board shall advise The University regarding implementation of the Plan. In addition, the Board shall review the Plan every five (5) years and advise The University regarding modification of the Plan.
- c. Board meetings. Board members will be provided notice ten (10) working days in advance of a meeting. Fifty percent (50%) plus one (1) members of the parties in interest present in person or by proxy shall constitute a quorum for transaction of business at all meetings of the Board. Each member of the Board will have one vote in decisions put before the Board. Decisions regarding advice to The University shall be made by an eighty percent (80%) majority vote of the Board members present at a meeting.
- d. Program implementation. The University shall implement the Program by hiring and directing Reserve staff, supervising and coordinating implementation of the provisions of the Plan, and by receiving and acting upon the recommendations of the Board and participating site managers. The Reserve staff will be directly responsible for Program coordination with agency/entity representatives having jurisdiction over Reserve sites. The University's obligation to implement the Plan is contingent upon continued receipt of Grants for the purpose of operating the Program.
- e. Advisory committees. The Board may create committees or subcommittees to provide technical information or linkage to the broader community pertaining to the three main missions of the Reserve Program: research, education, and stewardship. Members of committees or

- subcommittees will serve without compensation from the Reserve.
- f. New Board members affiliated with new parties-in-interest may be added to the Board by a majority vote.
7. No projects shall be carried out on Reserve lands without the approval of the agency/entity having jurisdiction over such lands. The requesting agency/entity shall maintain all facilities built on in furtherance of a project, and shall cooperate with Reserve staff in carrying out the approved Program.
 8. The Reserve staff, Board, and appropriate advisory participants, if any, shall confer regularly to ensure coordination between the Reserve Program and the broader goals and mandates of regional coastal management programs that affect the MAE.
 9. This MOU shall not be construed to preclude additional transfers of property among the parties-in-interest, or to preclude additions or subtractions of appropriate lands to Reserve sites.
 10. This MOU shall continue on an on-going basis so long as the Reserve Program is funded and remains viable. This MOU may be amended or terminated by the parties-in-interest at any time by majority vote and by written amendment to all parties-at-interest. Nothing in this MOU shall preclude the partial or unilateral withdrawal of any of the parties-in-interest. In such an eventuality, it is understood that the lands of the withdrawing party-in-interest would be de-designated from the Reserve, and it is further understood that, should the withdrawing party-in-interest have received federal awards related to the Reserve Program, it will notify such federal agencies as required with respect to modification or termination of current or pending grants.
 11. All parties-in-interest agree to exert their reasonable best efforts to cooperate with the Reserve Program so that it can achieve its mission to serve as a regionally-scaled scientific and educational resource to help promote and recover the ecological health of the MAE and to create a more sustainable regional environment for future generations.
 12. The parties-in-interest understand that The University's primary mission is education and the advancement of knowledge and research, and consequently The University's activities under this MOU are designed to carry out that mission.
 13. The manner of performance of The University's activities under this MOU shall be determined by The University. The University does not guarantee specific results. The University is free to continue similar research and educational activities on other projects. The University may discuss its activities under

this MOU with other entities and individuals.

14. The University shall have the right to use, publish, and disclose data, information, or writings generated by University activities under the Program.
15. Nothing in this MOU or subsequent financial assistance awards shall obligate any party-in-interest in the expenditure of funds, or for future payments of money, in excess of appropriations authorized by law.
16. The parties-in-interest agree to comply with all applicable federal, state, and local laws regulating ethical conduct of public officers and employees.
17. Each party-in-interest will comply with all applicable laws, regulations, and executive orders relative to Equal Employment Opportunity.
18. Upon termination of this MOU, any equipment purchased by a party-in-interest for activities initiated in furtherance of this MOU will be retained by the respective party-in-interest, as permitted if purchased with third party or federal funds, that made the initial purchase.
19. A free exchange of research and assessment data among the parties-in-interest is encouraged and is necessary to insure the success of these cooperative activities.
20. This MOU is subject to availability of appropriated funds.
21. This MOU is the entire agreement between the parties-in-interest regarding the subject matter contained in this MOU.
22. The parties-in-interest are independent entities and are not legal partners or joint venture parties. The employees of one party-in-interest are not employees of any other party-in-interest.
23. The parties-in-interest shall not be liable for any incidental, indirect, special or consequential damages arising out of or related to this MOU.
24. The parties-in-interest are not making any express or implied warranties of merchantability, fitness for a particular purpose, freedom of infringement, or any other warranties of any kind or nature.
25. This MOU shall be binding on the successors and/or assigns of the parties-in-interest.
26. This MOU shall be construed and enforced in accordance with the laws of the State of Texas, exclusive of its choice of law provisions, as well as any

applicable United States federal laws and regulations.

27. If any clause, sentence or other portion of this MOU shall become illegal, null or void for any reason, the remaining portions of this MOU shall remain in full force and effect.
28. No waiver of right by any party-in-interest of any provision of this MOU shall be binding unless expressly confirmed in writing by the party-in-interest giving the waiver.
29. No party-in-interest shall be liable for delays in performing the MOU due to factors beyond the reasonable control of such party-in-interest.
30. Those provisions of this MOU which by their nature extend beyond termination or expiration of this MOU shall survive such termination or expiration.

UNDERSTOOD AND AGREED

University of Texas Marine Science Institute

By: _____

Name: Dr. Robert W. Dickey

Title: Director

Date: _____

Texas General Land Office

By: _____

Name: George P. Bush

Title: Commissioner

Date: _____

Texas Parks and Wildlife Department

By: _____

Name: Carter Smith

Title: Executive Director

Date: _____

Texas Department of Transportation

By: _____

Name: Lt. General Joe Weber

Title: Executive Director

Date: _____

U.S. Fish and Wildlife Service

By: _____

Name: Joe Saenz

Title: Project Leader

Date: _____

Coastal Bend Bays & Estuary Program

By: _____

Name: Ray Allen

Title: Director

Date: _____

The Nature Conservancy

By: _____

Name: Laura Huffman

Title: Texas State Director

Date: _____

Coastal Bend Land Trust

By: _____

Name: Jake Herring

Title: Director

Date: _____

Fennessey Ranch

By: _____

Name: Brien O'Connor Dunn

Title: Owner

Date: _____

City of Rockport

By: _____

Name: Honorable C.J. Wax

Title: Mayor

Date: _____

Aransas County Navigation District

By: _____

Name: Judith Vlaseck

Title: Commissioner

Date: _____

Aransas County

By: _____

Name: Honorable Burt Mills

Title: Judge

Date: _____

ATTACHMENT A

Properties included in the Reserve:

- Texas General Land Office: State Submerged lands in the Mission-Aransas Estuary
- Texas Parks and Wildlife Department: Goose Island State Park, including the Big Tree Unit
- U.S. Fish and Wildlife Service: Aransas National Wildlife Refuge and part of the Matagorda National Wildlife Refuge
- Coastal Bend Bays & Estuaries Program: Aransas Delta and Holiday Beach Properties
- Coastal Bend Land Trust: Buccaneer Cove
- Brient O'Connor Dunn: Fennessey Ranch
- Aransas County Navigation District: Land adjacent to Rockport Beach Park

ATTACHMENT B

The Mission-Aransas National Estuarine Research Reserve Management Plan

APPENDIX F

COASTAL LEASE FOR SCIENTIFIC PURPOSES FROM GLO TO UTMSI

TEXAS GENERAL LAND OFFICE



COASTAL SURFACE LEASE NO. SL20120014

STATE OF TEXAS

§
§

KNOW ALL MEN BY THESE PRESENTS:

COUNTIES OF NUECES,

REFUGIO, ARANSAS, CALHOUN

§

This Commercial Coastal Surface Lease No SL20120014 (hereinafter the "Lease") is granted by virtue of the authority granted by Chapter 51, TEX. NAT. RES. CODE and all amendments thereto; 31 Texas Administrative Code Chapter 13 and all other applicable statutes and rules, as the same may be promulgated and/or amended from time to time; and subject to all rules and regulations promulgated by the Commissioner of the Texas General Land Office and/or the School Land Board, pursuant thereto and all other applicable statutes.

Article I. Parties

1.01. In consideration of the mutual covenants and agreements set forth herein, the STATE OF TEXAS, acting by and through the School Land Board and its Chairman, the Commissioner of the General Land Office (the "State"), hereby leases to and authorizes the Board of Regents of the University of Texas System, for the use and benefit of The University of Texas at Austin Marine Science Institute, whose address is 750 Channel View Drive, Port Aransas, Texas 78373, (the "Lessee"), to use the "Premises" (defined below) for the purposes identified in Article IV below.

Article II. Premises

2.01. The Premises consists of portions of various bays and estuaries located in Aransas, Refugio, Nueces and Calhoun Counties, and is further described or depicted on the map of the Premises as shown on Exhibit A, and labeled thereon as "State Submerged Tracts" and further depicted in the Texas National Estuarine Research Reserve: Mission-Aransas Estuary Final Management Plan as contained in Exhibit B, both attached hereto and incorporated by reference for all purposes.

The following Cabin Permit Sites as described herein and shown on Exhibits A, B, B-1, B-2, B-3 and B-4 each attached hereto and incorporated by reference for all purposes, have been issued by the General Land Office and are specifically excluded from the Premises. The exclusion extends to any point within 1,000 feet of the location described herein.

1. PC 1028, Lat 28.1685, Long -96.8312, State Tract No. 24, Aransas Bay
2. PC 1041, Lat 28.1690, Long - 96.8306, State Tract No. 24, Aransas Bay
3. PC 1029, Lat 27.963, Long - 97.069, State Tract No. 218, Aransas Bay
4. PC 1003, Lat 28.1679, Long - 96.8318, State Tract No. 24, Aransas Bay
5. CL 20010013, Lat 27.9746, Long - 97.0692, State Tract No. 218, Aransas Bay

2.02. The General Land Office (GLO), representing the School Land Board (SLB) and the Permanent School Fund (PSF) has granted, and will continue to grant, various Coastal Easements, Structure Registrations, Letters of Authorization, Commercial Leases, Coastal Leases, Cabin Permits, Surface Leases, Miscellaneous Easements, and Oil and Gas exploration, production and transportation leases within the limits of the Mission-Aransas National Estuarine Research Reserve. The premises of these authorized uses of Coastal Public Land are excluded from the Premises of this Lease, as and when such authorized uses commence. The State will provide lessee with written notice, identifying the area of such authorized sites and providing Lessee with contact information for the authorized users. Lessee's use of these authorized sites outside the Premises is prohibited without the prior written consent of the authorized user.

2.03 LESSEE ACCEPTS THE PHYSICAL AND TOPOGRAPHIC CONDITION OF THE PREMISES IN ITS EXISTING PHYSICAL AND TOPOGRAPHIC CONDITION. LESSEE IS NOT RELYING ON ANY REPRESENTATION OR WARRANTY OF THE STATE REGARDING ANY ASPECT OF THE PREMISES, BUT IS RELYING ON LESSEE'S OWN INSPECTION OF THE PREMISES. THE STATE DISCLAIMS ANY AND ALL WARRANTIES OF HABITABILITY, MERCHANTABILITY, SUITABILITY, FITNESS FOR ANY PURPOSE, AND ANY OTHER WARRANTY WHATSOEVER NOT EXPRESSLY SET FORTH IN THIS LEASE. THE STATE AND LESSEE HEREBY AGREE AND ACKNOWLEDGE THAT THE USE OF THE TERMS "GRANT" AND/OR "CONVEY" IN NO WAY IMPLIES THAT THIS LEASE OR THE PREMISES ARE FREE OF LIENS, ENCUMBRANCES AND/OR PRIOR RIGHTS. LESSEE IS HEREBY PUT ON NOTICE THAT ANY PRIOR GRANT AND/OR ENCUMBRANCES MAY BE OF RECORD AND LESSEE IS ADVISED TO EXAMINE ALL RECORDS OF THE STATE AND COUNTY IN WHICH THE PREMISES IS LOCATED. THE PROVISIONS OF THIS SECTION SHALL SURVIVE THE TERMINATION OF THIS LEASE.

Article III. Term

3.01. Beginning May 1, 2011, the use allowed by this Lease shall continue for a period of ten (10) years, unless the State or Lessee terminates this Lease upon 30-day written notice to the other party, to its address set forth in Article I. Provided that the School Land Board, in its sole discretion, has approved any changes to the Program Management Plan, and further provided that the Lease has not been previously terminated as provided for herein, this Lease shall be automatically renewed at the end of each five-year term for an additional five years.

Article IV. Use of Premises

4.01. The Premises may be used by Lessee solely for research and education conducted as activities and programs of the Texas National Estuarine Research Reserve: Mission-Aransas Estuary ("Reserve") and for no other purpose. Subject to the terms and conditions of this Lease, the Premises are to remain in their current topographical and hydrologic condition. Lessee is specifically prohibited from modifying the Premises in any manner not authorized herein, and from using, or allowing the use by others of the Premises for any other purpose, subject to the terms of this Lease.

4.02. The State reserves the exclusive right to grant easements, rights-of way and/or other grants of interest authorizing use of the Premises. These grants will either be subject to this Lease or will be excluded from the Premises of this Lease under Article 2.02 above.

4.03. Continued use of the Premises is subject to the following conditions (the "Conditions"):

1. Use of the Premises by Lessee is subject to and shall conform to the requirements of the Reserve Final Management Plan, regarding management and operation of the Reserve, and the Memorandum of Understanding between Lessee, GLO, Texas Parks and Wildlife Department, Texas Department of Transportation, U.S. Fish and Wildlife Service, The Nature Conservancy, Coastal Bend Land Trust, Coastal Bend Bays and Estuary Program, Fennessey Ranch, and the Aransas County Navigation District included as Appendix 3 to the Reserve Final Management Plan, attached and incorporated by reference as Exhibit B.
2. Research and education activities shall be consistent with Exhibit B, the Reserve Final Management Plan.

3. Use of the Premises by Lessee as described in Exhibit B, the Reserve Final Management Plan, may not be changed without the concurrence of the School Land Board.
4. Structures or facilities may be built on state-owned submerged lands in furtherance of the research and education activities and programs of the Reserve only with the written consent of the General Land Office.
5. Structures or facilities built by Lessee on state-owned submerged lands shall be maintained by Lessee unless otherwise provided by written agreement between the General Land Office and Lessee.
6. Use of the Premises is exclusive to Lessee only with respect to structures or facilities built or installed by Lessee.
7. Use of the Premises is subject to and shall conform to the requirements of the Texas Coastal Management Plan.

Article V. Assignments

- 5.01. This Lease and the uses allowed hereunder are not assignable by the Lessee.

Article VI. Protection of Natural and Historical Resources

6.01. With respect to the Premises, Lessee shall comply with all applicable rules and regulations of the General Land Office and other governmental agencies responsible for the protection and preservation of public lands and waters, including those relating to pollution. In the event of pollution or an incident that may result in pollution of the Premises or adjacent property which is the result of Lessee's (or Lessee's employees, contractors, invitees and agents) acts or omissions, Lessee shall immediately notify the State, use all means reasonably available to recapture any pollutants which have escaped or may escape, and mitigate for any and all natural resources damages caused thereby.

6.02. **LESSEE IS EXPRESSLY PLACED ON NOTICE OF THE NATIONAL HISTORICAL PRESERVATION ACT OF 1966, (PB-89-66, 80 STATUTE 915; §470) AND THE ANTIQUITIES CODE OF TEXAS, CHAPTER 191, TEX. NAT. RES. CODE ANN. (VERNON 2000 SUPP.). IN THE EVENT THAT ANY SITE, OBJECT, LOCATION, ARTIFACT OR OTHER FEATURE OF ARCHEOLOGICAL, SCIENTIFIC, EDUCATIONAL, CULTURAL OR HISTORIC INTEREST IS ENCOUNTERED DURING ANY ACTIVITY ON THE PREMISES, LESSEE WILL IMMEDIATELY CEASE SUCH ACTIVITIES AND WILL IMMEDIATELY NOTIFY STATE AND THE TEXAS HISTORICAL COMMISSION, P.O. BOX 12276, AUSTIN, TEXAS 78711, SO THAT ADEQUATE MEASURES MAY BE UNDERTAKEN TO PROTECT OR RECOVER SUCH DISCOVERIES OR FINDINGS, AS APPROPRIATE.**

VII. Indemnity

7.01. **TO THE EXTENT AUTHORIZED BY LAW, LESSEE SHALL BE FULLY LIABLE AND RESPONSIBLE FOR ANY DAMAGE, OF ANY NATURE, ARISING OR RESULTING FROM ITS OWN ACTS OR OMISSIONS RELATED TO ITS EXERCISE OF THE RIGHTS GRANTED HEREIN, AND LESSEE AGREES TO AND SHALL INDEMNIFY AND HOLD THE STATE, THE STATE'S OFFICERS, AGENTS, AND EMPLOYEES, HARMLESS FROM AND AGAINST CLAIMS, SUIT, COSTS, LIABILITY OR DAMAGES OF ANY KIND, INCLUDING STRICT LIABILITY CLAIMS, WITHOUT LIMIT AND WITHOUT REGARD TO CAUSE OF THE DAMAGES OR THE NEGLIGENCE OF ANY PARTY, EXCEPT FOR THE CONSEQUENCES OF THE NEGLIGENT ACTS OR WILLFUL MISCONDUCT OF THE STATE, THE STATE'S OFFICERS, AGENTS, EMPLOYEES, OR INVITEES, ARISING DIRECTLY OR INDIRECTLY FROM LESSEE'S USE OF THE PREMISES (OR ANY ADJACENT OR CONTIGUOUS PSF LAND) OR FROM ANY BREACH BY LESSEE OF THE TERMS CONTAINED HEREIN. THE PROVISIONS OF THIS SECTION SHALL SURVIVE EXPIRATION OR EARLIER TERMINATION OF THIS LEASE.**

Article VIII. Property Removal and Taxes

8.01. Upon termination of this Lease, Lessee shall remove its personal property from the Premises within 30 days thereafter. **THE TERMS OF THIS SECTION SHALL SURVIVE EXPIRATION OR EARLIER TERMINATION OF THIS LEASE.**

8.02. TO THE EXTENT AUTHORIZED BY LAW, LESSEE AGREES TO AND SHALL PROTECT AND HOLD THE STATE HARMLESS FROM LIABILITY FOR ANY AND ALL TAXES, CHARGES, AND ASSESSMENTS, TOGETHER WITH ANY PENALTIES AND INTEREST THEREON, ARISING OUT OF LESSEE'S USE OF THE PREMISES, AND FROM ANY SALE OR OTHER PROCEEDING TO ENFORCE PAYMENT THEREOF.

Article IX. Consideration

9.01. A. As consideration ("Consideration") for the granting of this Lease, Lessee shall pay rent ("Rent") to the State (payable to the Commissioner of the Texas General Land Office at Austin, Texas) the sum of **Seventy Two Thousand Six hundred and 00/100 Dollars (\$72,600.00)**.

B. Consideration for this Lease shall be payable in ten(10) annual installments, in advance, of **Seven Thousand Two Hundred Sixty And 00/100 Dollars (\$7,260.00)**. The first annual installment shall be made upon the execution hereof and subsequent annual installments are to be made on or before each anniversary of the effective date hereof.

C. If the Premises are reduced to less than 50% of their original area, then the Consideration will be reduced to the sum of **Three Thousand Six Hundred Thirty and 00/100 Dollars (\$3,630.00)** annually until the anniversary date following if and when the Premises are restored to 50% or more of their original area.

Article X. Miscellaneous Provisions

10.01. In the event any provision of this Lease is more restrictive than any administrative rule promulgated by the General Land Office and/or the School Land Board, this Lease shall control.

IN TESTIMONY WHEREOF, witness my hand and the Seal of Office.

STATE:
THE STATE OF TEXAS

LESSEE:
Board of Regents of the University of Texas
System, for the use and benefit of The University
of Texas at Austin Marine Science Institute

By: *Jerry E. Patterson*
JERRY E. PATTERSON
Commissioner, General Land Office
Chairman, School Land Board

By: *Amy Wanamaker*
(Signature)

Date: 11/1/12

Amy Wanamaker
(Printed Name)

Campus Director of Real Estate
(Title)

Date: June 27, 2012

APPROVED:
Contents: *SIR MSP*
Legal: *[Signature]*
Deputy: *[Signature]*
Executive: *[Signature]*

ACKNOWLEDGMENT

STATE OF Texas §
 §
COUNTY OF Travis §

This instrument was acknowledged before me on the 27 day of June, 20 12,

by Amy Wanamaker
(Lessee representative signing this document)

Jessica Pinto
(Notary Signature)



Notary Public, State of Texas

My commission expires: 1-8-2014

APPENDIX G

DESCRIPTION OF KEY PARTNERS

Key Reserve Partners

Texas General Land Office (GLO)

GLO is the primary landholder for water habitats within the Reserve. In Texas, bay and estuary bottoms covered by water to mean high tide line are state owned submerged land, of which the GLO is the trustee. GLO is also the landholder for a 58 acre state parcel of land adjacent to Mission Bay. Land holdings (115,221 ac) of the GLO total 62% of the Reserve.

The GLO organizational structure is divided into the following program areas: executive, administration, asset management, professional services, budget division, coastal resources, energy resources, funds management, governmental relations, human resources, information system, legal services, office of communications, oil spill prevention and response, and veterans land board. The Reserve works closely with the executive office, asset management, coastal resources, and energy resources. Further detailed information on the GLO can be found on their website (www.glo.state.tx.us).

The executive office is run by an elected land commissioner and an appointed deputy land commissioner. The land commissioner also chairs the School Land Board (SLB). The SLB is the trustee of the state's Permanent School Fund (PSF). The proceeds of energy and mineral leasing activities on GLO land are deposited into the PSF and are used to help finance public primary and secondary education in Texas. Authorization from the land commissioner or the SLB is required for any project on GLO land, and this is why the Reserve coastal lease is designed as a perpetual lease with a 20-year renewable term dependent on the SLB approval.

Leasing of non-mineral activities is handled by Professional Services. The Reserve's coastal lease for scientific purposes will be managed by Professional Services through the Asset Inspection Program. The Asset Inspection Program manages the state's surface interests on an estimated four million acres of state-owned coastal public land along the Texas Gulf Coast. Energy Resources handles all energy and mineral development. Revenue generated from development is deposited in the PSF. The other GLO program area that the Reserve works closely with is Coastal Resources.

Coastal Resources is charged with the protection and preservation of the natural resources of this state. Coastal Resources has three main divisions: coastal coordination division, coastal stewardship division, and the financial and technical services division. The Coastal Coordination Division manages and administers the Texas Coastal Management Program (CMP) for the Coastal Coordination Council. The Coastal Stewardship Division manages the state's erosion program authorized by the Coastal Erosion Planning and Response Act (CEPRA) to fund projects such as beach nourishment, dune restoration, shoreline protection, and marsh restoration. The Financial and Technical Services Division represents the customer service component of the Coastal Resources program, providing assistance and support to both internal and external customers.

United State Fish and Wildlife Service (USFWS)

The USFWS is the primary landholder for terrestrial habitats within the Reserve. Approximately 36% of the reserve acreage (66,210 ac) is located in the Aransas National Wildlife Refuge. The Aransas National Wildlife Refuge was established on December 31, 1937.

Since its establishment there have been four additional units added on the primary Aransas Unit on Blackjack Peninsula. The Tatton Unit was added by donation in 1967 and is a contiguous 7,568 acre stretch of coastal grassland between Highway 35 and the western shore of St. Charles Bay. In 1991, the Lamar Unit was added as a disjunct 734 acre area of live oak motte and salt marsh on the western shore of St. Charles Bay (McAlister and McAlister 1985). The 245 wetland parcel of the Johnson Ranch that was recently donated to the ANWR will supplement the Lamar Unit. An additional Myrtle Foester Whitmire Unit, 22 miles

north of the primary Aransas Unit, is also included in the Refuge boundary but it is not within the NERR boundary. The Matagorda Island Unit of 26,000 acres was added to the refuge in 1982, and in 1988 the Nature Conservancy donated an additional 56,500 acres to include the entire island in the refuge system. The northern two thirds of Matagorda Island (44,000 acres) is under management by the TPWD as a Wildlife Management Area. This portion of the Island is open for limited recreational use. Only the southern portion of the Matagorda Island Unit is included in the Reserve.

Current management activities on the Aransas, Lamar, and Tatton units of the refuge include: brush control, rotational grazing, restoration and enhancement of grasslands (roller chopping), water flow manipulation, controlled burns, treatment and removal of invasive species (hunts, mechanical, and spraying), restoration of wetlands (inundation and disking), and controlled hunts of deer and hogs. Current management activities on the Matagorda Unit of the refuge include: water flow manipulation, controlled burns, and the treatment and removal of invasive species (hunts, mechanical, and spraying).

Texas Parks and Wildlife Department (TPWD)

TPWD is the manager of the Goose Island State Park, which now includes the Big Tree Unit. The park also has a coastal lease of submerged land adjacent to the park that includes seagrass beds and oyster reefs. The TPWD manages 0.1% of acreage within the Reserve. TPWD is Texas's primary marine resource management agency. The mission of TPWD is to manage and conserve the natural and cultural resources of Texas and to provide hunting, fishing, and outdoor recreation opportunities for the use and enjoyment of present and future generations. TPWD seeks to minimize impacts to fish and wildlife resources (including their habitats) through the federal process, by providing comments to regulatory agencies, such as the Corps of Engineers, that seek to minimize impacts from proposed developments to fish and wildlife resources. TPWD's role in managing the state's fish and wildlife resources are authorized under the U.S. Fish and Wildlife Coordination Act.

The agency currently has 10 internal divisions: Wildlife, Coastal Fisheries, Inland Fisheries, Law Enforcement, State Parks, Infrastructure, Legal, Communications, Administrative Resources, and Human Resources. Three senior division directors provide special counsel to the Executive Director in the areas of water policy, land policy, and administrative matters. Intergovernmental affairs and internal audit and investigations are administered through the Executive Office. Further detailed information on the TPWD can be found on their website (<http://www.tpwd.state.tx.us/>).

The Wildlife Division's mission is to manage and conserve the natural and cultural resources of Texas and to provide hunting, fishing, and outdoor recreation opportunities for the use and enjoyment of present and future generations. To accomplish this mission, Division personnel annually conduct wildlife population surveys, provide recommendations concerning the management of vertebrate wildlife species, conduct wildlife research studies, manage wildlife management areas, hold public hunts, provide landowner incentives to manage for rare species, inform the public about wildlife, provide technical guidance to private landowners, and develop wildlife management plans for private lands.

The Coastal Fisheries Division manages the marine fishery resources of Texas' four million acres of saltwater, including the bays and estuaries and out to nine nautical miles in the Gulf of Mexico. Coastal Fisheries management strategies are directed toward optimizing the long-term utilization of the marine resources of Texas. This management is designed to sustain fisheries harvest at levels that are necessary to ensure replenishable stocks of commercially and recreationally important species and to provide for balanced food webs within Texas marine ecosystems. Technical data to assess population levels and develop appropriate fishing regulations are collected through coastwide, year-round standardized monitoring programs. In addition, life history studies and genetic research provide state-of-the-art knowledge for enhancing fishery stocks. Three world-class hatchery facilities directly enhance populations of several game fish to increase

abundance and help offset impacts of natural catastrophes. The Coastal Fisheries staff work closely with other department divisions as well as federal and international fishery management agencies to provide optimum opportunities from and conservation for the rich biological diversity inherent in Texas' marine waters.

The Inland Fisheries Division is responsible for managing the state's diverse freshwater fisheries resources. The goal of this management is to provide the best possible angling while protecting and enhancing freshwater aquatic resources. The resources include public impoundments and rivers and streams. These resources are used by about millions of anglers 16 years of age and older whose fishing activities provide great benefit to the Texas economy through direct angler spending on food, lodging, transportation and equipment. The division's activities include fisheries management and research, fish production, angler education and information, fishing access projects and aquatic habitat management.

The Law Enforcement Division provides a comprehensive statewide law enforcement program to protect Texas' wildlife, other natural resources, and the environment. The Division also provides safe boating and recreational water safety on public waters by ensuring compliance with applicable state laws and regulations. Texas Game Wardens are responsible for enforcement of the Parks and Wildlife Code, all TPWD regulations, the Texas Penal Code and selected statutes and regulations applicable to clean air and water, hazardous materials and human health. Wardens fulfill these responsibilities through educating the public about various laws and regulations, preventing violations by conducting high visibility patrols, and apprehending and arresting violators. Operation Game Thief provides citizens with a toll-free number to report poaching and other violations. The Law Enforcement Division employs wardens throughout the state and operates dozens of field offices that sell licenses, register boats, and provide the public with local information across the state.

The divisions of Coastal Fisheries, Inland Fisheries and Law Enforcement also respond to fish and wildlife kills and pollution events to assess the impacts to fish and wildlife resources. These divisions determine the responsible party if any, and to seek restitution from responsible parties. The restitution funds are then invested in habitat restoration/enhancement projects. The State Parks Division is responsible for protecting, interpreting and managing cultural and natural resources of statewide significance and providing outdoor recreation opportunities and opportunities to learn about Texas history and natural science. The division oversees more than 600,000 acres of land owned or leased by the department, including 123 state parks, historic sites and natural areas. The division is aggressively pursuing enhanced marketing and more innovative management of state parks.

Coastal Bend Land Trust (CBLT)

The CBLT is a landholder of the Buccaneer Cove Preserve (142 ac) with ownership of 0.08% of acreage within the Reserve. Buccaneer Cove Preserve is located at the mouth of the Aransas River and contains wetlands such as estuarine tidal flats and brackish marshes. The CBLT was founded in 1998 by the Coastal Bend Bays Foundation. The primary goal of the CBLT is the preservation and enhancement of native wildlife habitat in the Coastal Bend. The Reserve is almost entirely encompassed within the operating region of the CBLT. The principal protection methods include donation of land, conservation easements, bargain sale of land, and site specific management plans. Further detailed information on the CBLT can be found on their website (www.coastalbendlandtrust.org/).

Fennessey Ranch

The Fennessey Ranch is the Reserve's only access to a river source and contains the only riparian habitat. The Fennessey Ranch owns 1.8% of the acreage (3,261 ac) within the Reserve. UT purchased a conservation easement on Fennessey Ranch in 2006. The Ranch is currently designed to be environmentally sound as well as an economically viable business. The current economic base incorporates hunting, wildlife tours, photography, kayaking tours, cattle enterprises, and oil and gas, (Croft and Smith 1997). It is composed of native tree/brush, prairie, freshwater wetlands, and Mission River riparian corridor. Wetlands at the

Fennessey ranch cover about 500 acres, of which are temporarily, seasonally and semipermanently flooded (White et al., 1998). Current management activities on Fennessey Ranch include: brush control, rotational grazing, enhancement and restoration of wetlands, a nine mile riparian recovery zone with no grazing, restoration of prairie and grasslands, controlled burns, controlled hunting program with no top predator hunts, and an electrical fencing system that does not impede wildlife. Further detailed information on Fennessey Ranch can be found on their website (www.fennesseyranch.com/).

The Nature Conservancy (TNC)

The Nature Conservancy is a member of the reserve advisory board because of their role in acquisition and restoration within the NERR area. The Conservancy was founded in 1951, with the mission to preserve the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive. The Conservancy has approximately 1 million members uses the following methods for acquiring and conserving land: (1) land acquisition, fee simple; (2) conservation easements; and (3) conservation buyer projects.

The Conservancy has developed a strategic, science-based planning process, called Conservation by Design, which identifies the highest-priority places that, if conserved, promise to ensure biodiversity over the long term. It is anticipated that upon designation, the Reserve will work with TNC and use their Conservation by Design Method to identify the high priority areas within the Reserve for future acquisition. TNC also plays an active role in many restoration efforts within the Texas Coastal Bend area, particularly oyster reef restoration projects. Further detailed information on TNC can be found on their website (www.tnc.org).

Texas Department of Transportation (TxDOT)

The Texas Department of Transportation (TxDOT) was established in 1917 as the Texas Highway Department to administer federal highway funds. TxDOT maintains the Copano Causeway that intersects the Reserve, as well as state highways that are adjacent to the Reserve. TxDOT, acting through the Texas Transportation Commission, is also the non-federal sponsor for the Gulf Intracoastal Waterway (GIWW). As the non-federal sponsor, the TxDOT coordinates local management efforts with the US Army Corps of Engineers. Coordination by TxDOT is run out of the GIWW Office in the Transportation Planning & Programming Division.

Coastal Bend Bays and Estuaries Program (CBBEP)

The majority of Reserve is encompassed within the CBBEP project area, which extends from Mesquite to Baffin Bay. The mission and goals of the CBBEP are similar to NERRS and a representative of CBBEP on the Reserve Advisory Board (RAB) is an ideal forum for collaboration between the two programs. The CBBEP supports research and develops management solutions with a specific focus on: public health issues, altered freshwater inflow into bays and estuaries, condition of living resources, loss of wetlands and estuarine habitats, degradation of water quality, altered estuarine circulation, bay debris, the CBBEP evolved from the Corpus Christi Bay National Estuary Program (CCBNEP). In 1998, CCBNEP developed the Coastal Bend Bays Plan (CBBEP, 1998a). This plan is a long-term, comprehensive management tool designed to complement and coordinate existing resource management programs and plans. Fifty specific actions were developed to address human uses, maritime commerce and dredging, habitat and living resources, water and sediment quality, public education and outreach, and freshwater resources. The CCBNEP was restructured with implementation of the Coastal Bend Bay Plan under the auspices of the CBBEP. Implementation of the plan structured the CBBEP into four basic functions of administration, planning, governance, and funding (CBBEP 1998b). CBBEP is also the land owner of properties on Holiday Beach and Aransas River Delta (407 ac) which make up 0.2% of the Reserve based on the revised boundary. Both properties are composed primarily of wetlands and provide valuable foraging areas for endangered Whooping Cranes. Further detailed information on the CBBEP can be found on their website (www.cbbep.org/).

Aransas County Navigation District, Aransas County, and City of Rockport

Local government representative from the Aransas County Navigation District (ACND), Aransas County, and the City of Rockport will be a part of the Reserve Advisory Board to ensure public input to Reserve management. The Reserve surrounds Live Oak Peninsula, which contains the biggest population center, the City of Rockport. The majority of the Reserve (139,311 acres, 75 %) is within Aransas County. The Reserve also collaborates with ACND and the City of Rockport to manage the Bay Education Center in Rockport.

University of Texas Marine Science Institute (UTMSI)

The University of Texas at Austin Marine Science Institute's owns 0.02% of the Reserve (31 acres, with 28 acres on land and 3 acres of wetland). The UTMSI campus includes the Reserve Headquarters in the Estuarine Research Center and two outreach facilities, the Estuary Explorium and the Wetlands Education Center. Addition laboratory and research space is available on the campus, as well as several dormitories and a fleet of research vessels and vehicles. Detailed information on the facilities present at UTMSI can be found in Section 8. UTMSI is an organized research unit of the University of Texas at Austin. UTMSI's director reports to the dean of the College of Natural Sciences, who then reports to the Executive Vice President and Provost, who then reports to the President of the University. UTMSI is the state's lead agency for managing the Reserve.

UTMSI will implement the Reserve program by hiring and directing Reserve staff, supervising and coordinating implementation of the provisions of the management plan, and by receiving and acting upon the recommendations of the RAB and participating site managers. The reserve staff will be directly responsible for Program coordination with agency/entity representatives having jurisdiction over the Reserve. The University of Texas at Austin will also hold the scientific lease from the GLO for the state submerged bays and estuaries. Any activity for the Reserve program that requires legal assistance will be handled by the University of Texas Financial Affairs (Office of the Vice President and Chief Financial Officer), and the Office of the Vice President for Institutional Relations and Legal Affairs. The Financial Affairs office provides administrative support to the Vice President and Chief Financial Officer for the review, approval and execution of business contracts required for the procurement of services for the University, and provision of services by the University. The Office of Legal Affairs provides advice and support on University related legal issues and activities; assists in the development and implementation of related policies, guidelines, and training; and assists in the coordination of litigation and other activities with the UT System Office of General Counsel. This office reviews and interprets UT System and UT Austin policies and rules, state and federal laws, and other guidelines.

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APPENDIX H

FENNESSEY RANCH MANAGEMENT PLAN

Fennessey Ranch Management Plan

Prepared and Approved by:




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Photo courtesy of Todd Steele (www.toddstelephotoart.com)

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This management plan has been developed to supplement the Mission-Aransas National Estuarine Research Reserve Conservation Easement of Fennessey Ranch

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1.0 Introduction

Fennessey Ranch is a 3,251 acre, privately owned ranch with a conservation easement owned by the University of Texas at Austin. The Ranch is composed of native tree/brush, prairie, freshwater wetlands, and Mission River riparian corridor. Wetlands at Fennessey Ranch cover approximately 500 acres, which contain temporary, seasonal, and semi-permanent flooded areas¹ (Figure 1). The Fennessey Ranch management plan is a compilation of individual subject plans that include detailed descriptions of the current uses and state of improvement, as well as management of wildlife (i.e., hunting and fishing, grazing, prescribed control of native, exotic and feral species, supplemental food, supplemental shelter), habitat (e.g., prescribed burning, range enhancement, brush management, wetland enhancement, erosion control, archeological digs), monitoring, and access. The goal of this management plan is to allow for the generation of revenue from wildlife resources while maintaining and improving native and managed habitats for wildlife diversity, critical species, and rare native species. A native habitat contains species which arrived, established, and survived there without direct or indirect human assistance.

The Fennessey Ranch is subject to a perpetual conservation easement granted by Brien O'Connor Dunn to The Board of Regents of The University of Texas System (Appendix 1). The conservation easement was purchased by the University of Texas from a grant received to meet the goals of the National Estuarine Research Reserve System (NERRS). The NERRS is a network of protected areas established to promote informed management of the Nation's estuaries and coastal habitats. The reserve system is a network of 28 areas representing different biogeographic regions of the United States that are protected for long-term research, water-quality monitoring, education and coastal stewardship. Established by the Coastal Zone Management Act of 1972, as amended, the reserve system is a partnership program between the National Oceanic and Atmospheric Administration (NOAA) and the coastal states. NOAA provides funding, national guidance and technical assistance. Each reserve is managed on a daily basis by a lead state agency or university, with input from local stakeholders. The University of Texas at Austin is the Mission-Aransas Reserve's (Reserve) lead state partner.

This management plan serves to implement the conservation easement, to support the conservation values of that easement, and provide guidance on future activities funded by the mitigation of the pipeline installed in 2013 (Appendix 2). Those conservation values include the protection of native plants, animals, and plant communities on the property; preservation of estuarine areas and banks of the Mission River; preservation of the natural freshwater wetlands on the property; preservation of the natural flow of fresh water from the artesian wells located on the property; and the advancement and dissemination of man's understanding of the biology and hydrology of the property and the adjacent Mission River.

1 White, W.A., Tremblay, T.A., Hinson, J., Moulton, D.W., Pulich Jr., W.J., Smith, E.H., Jenkins, K.V., 1998. Current Status and Historical Trends of Selected Estuarine and Coastal Habitats in the Corpus Christi Bay National Estuary Program Study Area. Publication CCBNEP 29. Texas Natural Resource Conservation Commission, Austin. 161 pp.

Figure 1. Aerial view of Fennessey Ranch with major landscape features.



2.0 Current Uses and State of Improvement

Fennessey Ranch is currently managed with the goal to conserve the environment and maintain an economically viable business. The current economic base incorporates hunting, fishing, wildlife tours, kayak tours, photography leases, oil and gas production and development, and cattle enterprises. Current land management activities on Fennessey Ranch include: brush control,



Photo courtesy of Todd Steele (www.toddsteelephotoart.com)

rotational grazing, enhancement and restoration of wetlands, a nine-mile riparian recovery zone with no grazing, restoration of prairie and grasslands, controlled burns, controlled hunting program, and an electrical fencing system that does not impede wildlife migrations.

The 3,251 acre Fennessey Ranch has nine linear miles of river frontage on the Mission River - one of the two rivers that flow into Mission-Aransas Estuary. Fennessey Ranch is composed of diverse habitats including natural lakes, meadows, native tree/brush, prairie, freshwater wetlands, and Mission

River riparian corridor. Fennessey Ranch includes approximately 500 acres of wetlands, which are temporarily, seasonally, and semi-permanently flooded (Figure 1). The Ranch also contains a 200-acre permanent, natural lake known as McGill Lake. The abundance of valuable habitats and its location on a major migratory bird flyway make Fennessey Ranch host to one of the largest concentrations of waterfowl in Texas, including several threatened and endangered species such as the Wood Stork, Bald Eagle, Whooping Crane, Piping Plover, Snowy Plover, and Least Tern. Fennessey Ranch serves as a stop on the Texas Parks and Wildlife Department's Great Texas Coastal Birding Trail. In addition to its more than 400 species of birds, Fennessey Ranch is also home to 16 plant communities, 50 species of amphibians and reptiles, 70 species of moths and butterflies, alligators, armadillo, deer, wild boar, coyotes, bobcats, and cougars.



Photo courtesy of Todd Steele

Fennessey Ranch is composed of several miles of all-weather roads, fence lines, pipelines and corridors (Figure 2). There is also a power line easement, and several food plots, oil and gas wells, and water wells. There are currently four facilities including McGill Lake pavilion, the camp house, metal storage/workshop, and corrals (Figure 2). The camp house has a footprint of approximately 25 acres. Additional infrastructure throughout the Ranch includes 15 photo blinds (eight permanent and seven portable), a boardwalk and pier at McGill Lake, gate sign, and educational signs. The conservation easement allows for future facilities. These may include a conservation or research center and dorms. If built, this facility will be located on the shore of McGill Lake with a footprint of 15-acres. Additional facilities may include several observation platforms and a screened pavilion at Goose Roost for wildlife viewing, as well as restrooms at the McGill Lake Pavilion (Figure 3).

Figure 2. Fennessey Ranch facilities and infrastructure.

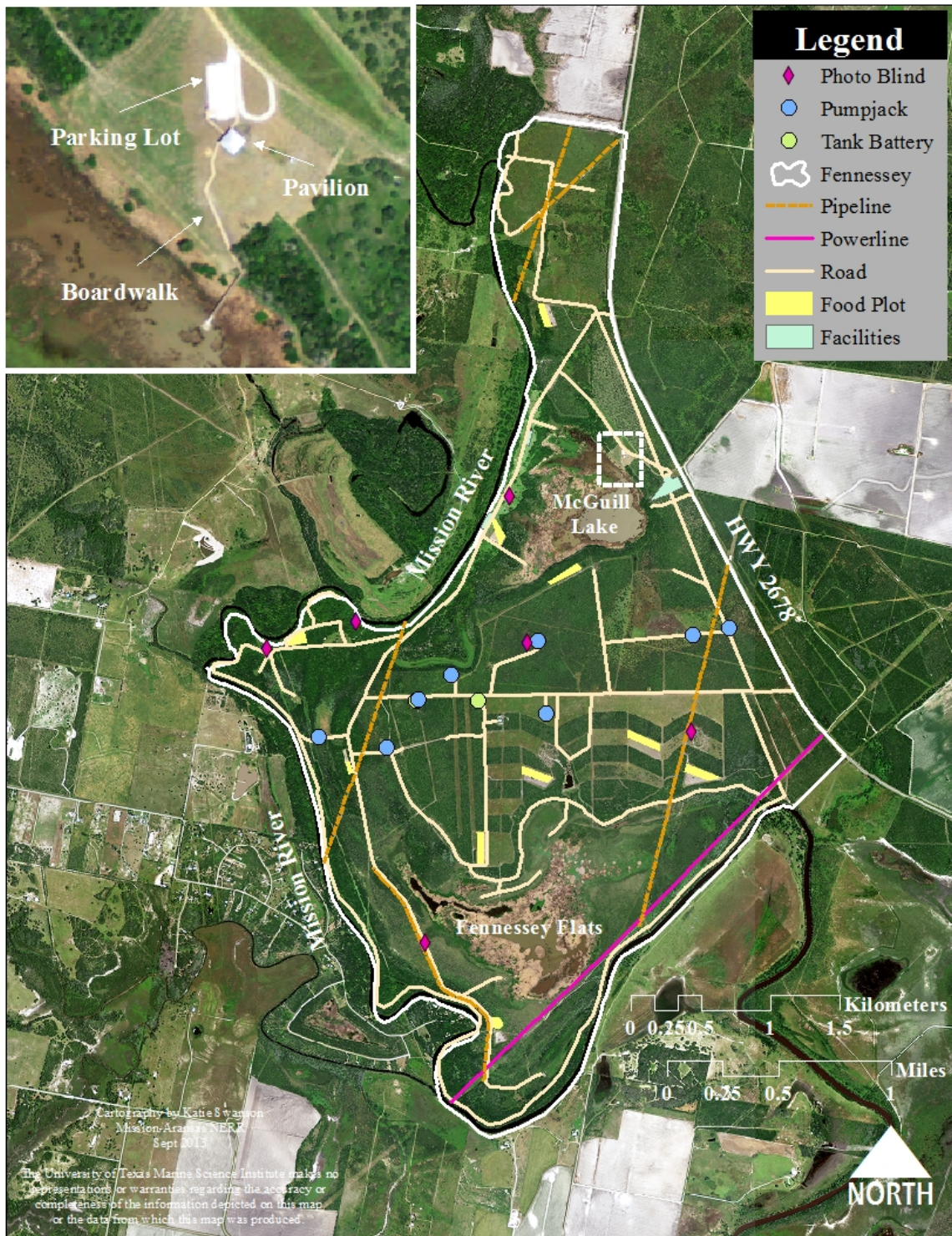


Figure 3. Anticipated locations of observation platforms and screened pavilion.



3.0 Wildlife Management Plan

3.1 Hunting and Fishing

Fennessey Ranch holds one hunting lease with 10 hunter slots, with each hunting slot corresponding to a specific food plot. This lease allows for hunting of deer, turkey, quail, feral hogs, and Russian boars. Hunting of deer and turkey occurs from November through January. Feral hogs and Russian boar can be hunted year round. Restrictions on lessee's include:



Photo courtesy of Todd Steele (www.toddsteelephotoart.com)

- No hunting at night or with dogs.
- In general, no harvesting of bucks under 3.5 years of age (unless they have an 8-point antler) or they are a selected cull.
- Off-road truck use is prohibited and all-terrain vehicles are recommended for transportation to hunting blinds. If a road is damaged due to lease activities, it must be

restored by the lessee to its original state.

- Hunters must discard carcasses in the authorized "gut pile". This allows for Fennessey Ranch to double check and track harvest records.
- Harvest limitations are set annually by Texas Parks and Wildlife Department as environmental conditions warrant. In 2014 the harvest limitations were set as: 30 male deer and 42 female deer.
- Hog and Russian boar hunts are sold to hunters on a per trip basis by Fennessey Ranch. Tom turkeys have not been a target species, but hunting of them is allowed.

Fennessey Ranch also conducts a doe harvest in January to prevent overpopulation. The target number of individuals to harvest is determined annually based on the buck to doe ratio that Fennessey Ranch can support. Currently Fennessey Ranch supports a buck:doe ratio of 1:1, and a buck:acre ratio of 1:10 acre. A buck:doe ratio of 1:1.5 would be considered ideal for Fennessey Ranch.



Photo courtesy of Todd Steele (www.toddsteelephotoart.com)

There shall be no hunting of waterfowl. If and when quail hunts occur, only pen-raised animals should be used. All shotgun shells must be picked up.

No predator hunts are allowed at the Ranch unless the hunts target invasive species or rabid individuals.

Currently the only fishing on Fennessey Ranch is for bass. Fishing is allowed as catch and release only at McGuill Lake, Fennessey Flats, and Fly-fishing Lake by owners, guests, and hunting leases.

Food Plots

Food plots are established annually (spring and fall) for perennial forages to provide supplemental food for deer and cover during these critical periods of the year. Livestock are excluded from food plots by fencing. Food plots not only serve to provide protein and enhance antler growth in deer, but also provide as supplements to the native habitat and wildlife. Bobcats are known to hunt around the food plots, and turkeys are regularly seen using the food plots. There are currently 33.3 acres of food plots on Fennessey Ranch that are planted with oats in the fall and are utilized for wild flowers in the spring. Food plots are not irrigated, but sometimes fertilized when needed.

3.2 Grazing

Grazing management is the planned manipulation of livestock numbers and grazing intensities to increase food, cover, or improve structure in the habitat of selected species. Grazing management includes not overstocking or overgrazing any area on Fennessey Ranch. Currently the Fennessey Ranch has one lease that allows for stocking of 150-300 head of cattle (2015). A grazing system is implemented to provide planned periodic rest for pastures by controlling grazing intensity and duration. This system is primarily based on frequent observation rather than predetermined times and locations, especially in times of drought. However, in general, cattle are grazed in St. John's Prairie during November through January, and not west of the Citgo pipeline during spring due to turkey nesting and wildflower growth. Cattle are excluded from the no grazing zone to prevent trampling and for vegetative recovery. Grazing in non-fenced riparian areas shall be evaluated biweekly, and cattle shall be moved if there are signs of erosion or damage to plants. During times of drought Fennessey Ranch is the most fragile to cattle grazing. When in droughts, cattle management should adhere to the conservation goal of Fennessey Ranch. During times of drought it may be necessary to bring in feed for cattle, or remove the cattle from the ranch completely.



3.3 Prescribed Control of Native, Nuisance and Invasive Species



Exotic or non-native plants and animals should not be introduced without prior approval from the University of Texas. Sometimes aggressive means must be used to control a number of native, exotic, and feral species. Populations of exotic and invasive plants and wildlife shall be strictly controlled to minimize negative impacts on native wildlife and habitats. Table 1 contains a list of current nuisance, invasive, or feral species currently found on Fennessey Ranch, and the approved method of control. Communication with Texas Parks and Wildlife and the Lady Bird Wildflower Center may be maintained for current control methods and information on additional threats. Observations shall

be used to assess and control the intensity and impacts of problem species to meet plan objectives. Included in these observations is annual vegetation monitoring by Mission-Aransas NERR staff at permanent sites located throughout the Ranch.

Species are labeled as nuisance when they are a native species, but have become problematic to the natural environment. Sometimes environmental factors are out of balance, allowing for a native species to grow unchecked. For example, if the natural fire cycle has been interrupted, Huisache can become a problem displacing native grass species. Nuisance wildlife management is the term given to the process of selective removal of problem individuals or populations of specific species of wildlife. Regulations on American alligators exist to ensure its continued protection while allowing for a sustainable leather trade. Alligators are considered a nuisance species on the Ranch due to safety and population number issues. Nests are legally harvested, and eggs are taken to a Texas alligator farm.

3.5 Supplemental Shelter

The best shelter and cover for wildlife is provided by a well-managed habitat. The following practices can be implemented to provide types of shelter that may be limited in the habitat.

Nest Boxes and Bat Boxes

The installation of artificial boxes is sometimes used to provide nesting habitat for Wood Ducks at McGuill Lake. Raptor poles have also been added at McGuill Lake to provide additional nesting habitat. Additional raptor poles, as well bat boxes, may be used in the future to provide nest or den habitat for selected species. Number and location of nest and bat boxes should be consistent with wildlife needs (i.e., territorial requirements of the target species and sufficient over the area to provide a real supplement to the target population) and address an identified severe limiting factor.

Brush Piles and Slash Retention

The planned placement and/or retention of brush piles is used to provide additional wildlife cover in habitats where cover is a limiting factor. This practice also includes slash retention, or leaving

Table 1. Table of current nuisance or invasive species (both plants and animals), their known locations, and allowable methods of control.

Species	Location	Method of Control
Invasive Species		
Chinese tallow	Upland	Burn, manual removal, herbicide (cut-stump and basal bark applications of triclopyr herbicide [such as 20% Garlon 4 in oil; use Rodeo for trees growing in water])
Chinaberry	Upland	Burn, manual removal, herbicide (cut-stump and basal bark applications of triclopyr herbicides)
Cat's claw	Upland	Manual removal, herbicide (current chemical controls include cutting the vines and painting the cut ends with glyphosate [100% solution] herbicide; triclopyr may provide good control as well [100% solution as a basal bark treatment] or 1-2% foliar spray with surfactant)
Water lettuce	McGuill Lake	Seine and burn, may require herbicide in the future (contact herbicides such as Endothall and Diquat will act quickly, while systemic herbicides such as Rodeo act slowly)
Feral hogs	Primarily upland	Shooting
Nutria	Wetlands	Shooting
Red fire ant	Upland	None yet, but may require insecticide in the future
Nuisance Species		
Bulrush	Fly fishing pond, McGuill Lake	Shredding, burn, herbicide (Roundup)
Huisache	Upland, Fennessey Flats	Burn, herbicide (basal spraying), shredding, cattle management
Retama	Upland	Burn, shredding, cattle management
Spartina	Fennessey Flats	Burn, shredding
Alligator	Wetlands	Harvest nests
Harvester ants	Upland	Insecticide when interferes with roads

dead brush on the ground where it was cut or uprooted, to provide wildlife cover and protection for seedlings of desirable plant species. Stacking posts or limbs in the shape of teepees can provide cover for small game and other wildlife in open areas. Brush piles are typically placed along pipelines and near MEL 13 wetland.

Half-cutting Trees or Shrubs

The practice of partially cutting branches of a live tree or shrub to encourage horizontal living cover near the ground and to provide supplemental cover in habitats where cover is lacking is done in all

riparian areas, including the Stream Management Zone (Figure 1). This practice is best done in the winter prior to leaf budding.

Woody Plant/Shrub Establishment

Planting and protecting native tree and shrub seedlings are used to establish wind rows, thickets, mottes, corridors, and solid stands to provide optimum habitat for selected species. Woody plant establishment have currently included cypresses seedlings in riparian areas.

4.0 Habitat Management Plan

In addition to the following habitat management practices there shall be no blanket poisoning by lease holders including Central Power and Light (CPL) and oil field companies.

4.1 Prescribed Burning Plan

Prescribed burning is the planned application of fire to enhance habitat and plant diversity, increase food and manipulate cover, or improve structure in the habitat of selected species. Fire lanes should be disked prior to all prescribed burns. When burning wetlands with Gulf Cordgrass (*Spartina spartinae*), a burn permit must be obtained from Texas Commission on Environmental Quality (TCEQ) and a burn plan must be submitted to Natural Resources Conservation Service (NRCS). Best efforts should be made to burn Fennessy Flats (800 acre) every three years and usually in January. St. John's Prairie and invasive bull rush should be burned in the summer. Burns should also occur in uplands when there is a high abundance of huisache or retama that impedes diversity and chokes out other flora.



4.2 Range Enhancement

Native herbaceous plants (*i.e.*, grasses and forbs) provide food and cover for wildlife and are useful for erosion control. It is anticipated that Alamo Switchgrass may be seeded in St. John's Prairie by broadcast method and may require some type of weed control. In addition, various species of cacti may become species of concern based on their location and may require reduced traffic of motorized vehicles in certain areas (*i.e.*, Cactus Grove, Figure 2).

4.3 Brush Management

Brush management is the removal or establishment of woody plants. Brush control includes the selective removal or suppression of target invasive woody species (*e.g.*, huisache, retama, Chinese tallow, and Chinaberry) to allow the increased production of desirable trees, shrubs, grasses, and forbs for forage, nesting, and/or protective cover for selected species. See section 2.3 for locations and methods of control for various woody invasive species.

Brush management should consider wildlife cover requirements, soil types, slope angle and direction, soil loss and erosion factors, and subsequent planning to control reinvasion. This practice also includes retention of brush piles to provide cover and nesting sites for cavity nesting animals. When used, herbicides should be applied in strict accordance with label directions.

Methods of brush control include herbicide (*e.g.*, huisache, Chinese tallow, Chinaberry, wetland and aquatic species), grubber or root plow, chain, roller chopper/aerator, Rhome disc, brush hog (shredder), dozer, and hand-cutting (chainsaw). Brush control such as mowing and shredding is primarily done in August to enhance wildflower growth in the spring. Brush management design for Fennessey Ranch is a mosaic that creates senderos. Some of these senderos are required by pipeline easement mandates.

In addition, periodic harvest, removal or suppression of trees or woody species is conducted in riparian habitats to allow the increased production of desirable trees, shrubs, grasses, and forbs for forage and nesting or protective cover for selected species. Raptors and other migratory birds require tall trees. Vegetation management may be done around tall-tree species to allow for optimal growth conditions of these specific tree species (*e.g.*, pecan trees).

4.4 Wetland Enhancement

Wetlands provide seasonal or permanent water for roosting, feeding, and nesting habitat for wetland wildlife. Wetland restoration, creation, or manipulation projects must have prior approval by the Grantee of the Conservation Easement. Wetlands management includes protection by modifications (*i.e.*, drainage, saltwater intrusion, filling, shape alteration, etc.), protection of vegetation, maintenance of water by pumping, seeding of grass/legumes, creation of buffers, prescribed grazing and burning, and fencing to enhance manageability. Currently, the wetlands at Fennessey Ranch are allowed to dry during summer and early fall. Water levels are maintained through pumping throughout the rest of the year and during times of drought for migratory waterfowl.

Wetland restoration or development may include providing seasonally available water such as shallow roost pond development; artificially creating wetlands; restoring, developing, or protecting marsh; restoration of prairie potholes; and moist soil management units. Moist soil management units are parcels of land that are typically flooded in the spring and then maintained wet during the growing season, to aid the summer production of annual wetland plants that produce large amount of seed. This management practice's goal is to maximize food production for waterfowl and shorebirds. Restoration projects and manipulation with control structures will be based on wildlife needs and suitability of the property. Potential future wetland enhancement projects include:

Fennessey Flats dike/levee, placement of water control structure at MEL 13 wetland, and continued maintenance of Kaiser flat water control structure. Enhancement projects will include revegetating to reduce erosion and sedimentation.



Monitoring of both groundwater wells and the Mission River will be conducted to assess groundwater conditions and connection with surface flows (Figure 4). Results from this monitoring will help the ranch manager and conservation easement holder manage groundwater, surface water, pumping wells, and wetland restoration projects. Annual assessment of groundwater and surface water levels and water quality will be taken into account when managing wetlands for wildlife and wetlands. If groundwater or surface water conditions deteriorate, then the ranch manager and conservation easement holder should design and implement a plan to restore water levels and water quality.

Researchers from the University of Texas Marine Science Institute have shown a high-level of interest in using Fennessey Ranch to conduct research on groundwater-surface water interactions. These interactions will become increasingly important to understand as the demand for water increases statewide in Texas.

4.5 Erosion Control

Erosion control is conducted through strict and continuous visual observation. Practices for erosion control include:

- Gully reshaping to force cattle away from eroded areas to speed recovery of eroded site.
- Revegetating areas along creeks, streams, ponds, and wetlands to reduce erosion and sedimentation, stabilize stream banks, improve plant diversity, and improve wildlife value of sensitive areas.
- Installation of fill dirt and bullrock along erodible embankments to prevent erosion and protect wildlife habitat.
- Establishment of stream crossings to provide permanent low water crossings in order to reduce or prevent erosion.
- Installation of gutters on the McGill Lake Pavilion, and the addition of a new, permeable product (to replace or stabilize the crushed granite) will help reduce erosion occurring along the platform pathway.



Figure 4. Location of Water Wells on Fennessey Ranch



4.6 Archeological Digs

There is evidence that archeological remains are located in Fennessey Flats. A survey was completed in 2012, with the installation of the pipeline, no artifacts were found. Any archeological digs or surveys that occur must have prior approval by the Grantee of the Conservation Easement and should restore habitat to original state.

5.0 Research and Monitoring Plan

5.1 Monitoring

Monitoring at Fennessey Ranch provides an estimation of species diversity, species numbers, annual population trends, population density, age structure, or sex ratio using accepted survey techniques. Harvest data should be collected and recorded annually for deer and hog. Data should include age, weight, and sex. For deer, antler development and embryo presence data should also be collected. These records will help determine sex ratios, body condition, and annual production.



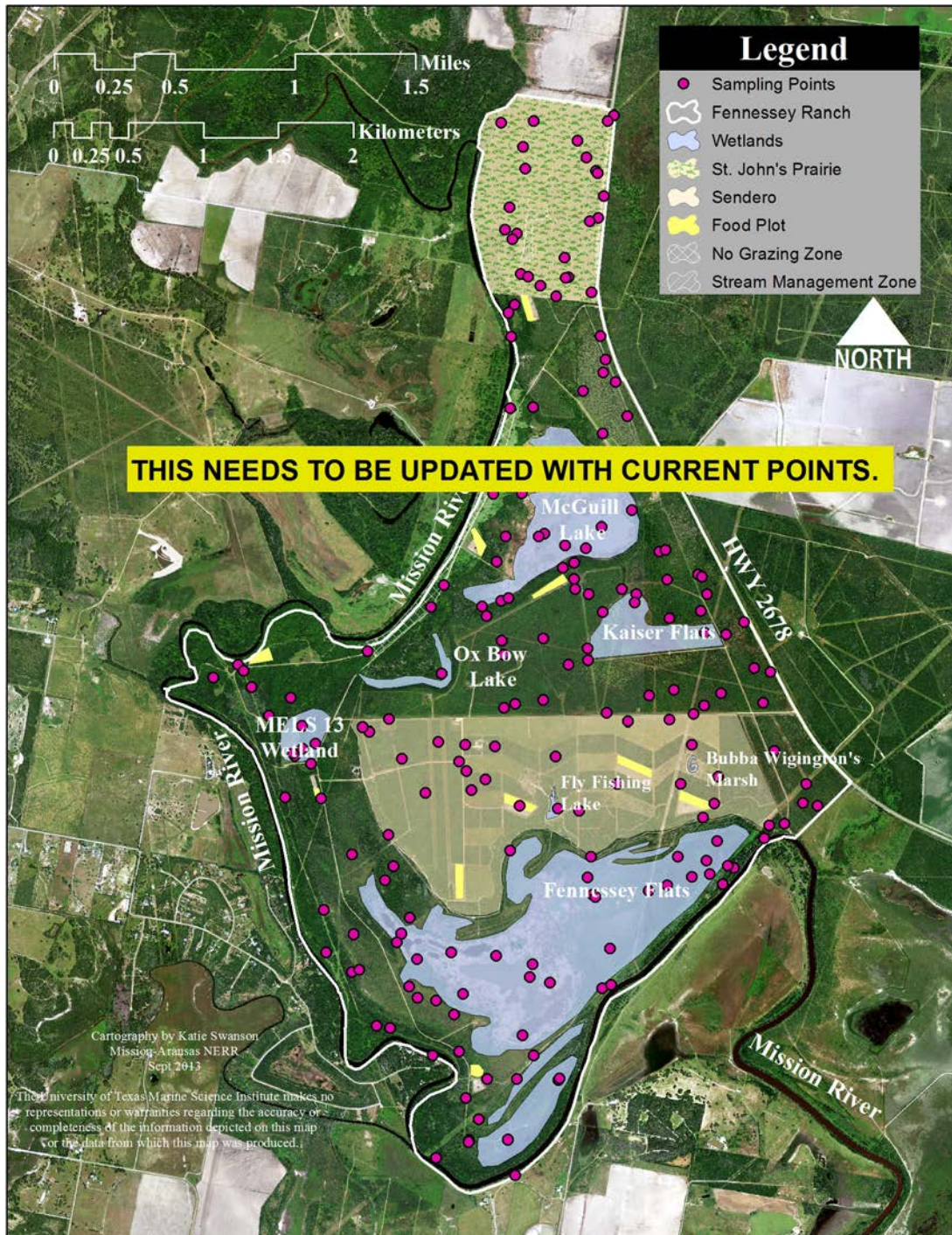
Regular, periodic counts of nongame wildlife species are also used to enhance management or increase knowledge of local, regional, or state status. This practice includes developing checklists of wildlife diversity for the property. Additional counts should include aerial counts of alligator nests, song bird transects and counts, turkey hen/poult counts, waterfowl/water bird counts, and butterfly counts. All records should be provided to the Mission-Aransas NERR on an annual basis as part of the “Annual Conservation Easement Monitoring Report.”

Monitoring of vegetative cover will also be conducted by staff of the Mission-Aransas NERR at specified sampling locations on an annual basis (Figure 5). Sampling at these locations includes observations of percent cover (trees, shrubs, and grasses/forbs), hydrologic conditions, soil type, and species present. These observations will allow Reserve staff to monitor short-term variability and long-term changes in the vegetative communities of the Ranch, and it will also serve to determine species diversity and presence of invasive species.

Annual monitoring of both groundwater wells and the Mission River will be conducted to assess groundwater conditions and connection with surface flows (Figure 4). Flow rate and water quality attributes such as salinity, temperature, pH, nutrients, and bacteria will help determine current conditions. All wells except for East Kaiser, Pavilion, and St. John’s are artesian.

Implementation of new monitoring programs will improve the ability of University of Texas Marine Science Institute and Fennessey Ranch staff to make management decisions that improve the conservation value of the Ranch. All proposed monitoring programs must be agreed upon by the Fennessey Ranch Manager and the Mission-Aransas NERR.

Figure 5. Location of Sampling Points for Annual Vegetation Monitoring on Fennessey Ranch



5.2 Research

Fennessey Ranch provides valuable opportunities for conducting research on a variety of topics, such as habitat mapping, water quality, water quantity, restoration science, and ecosystem services. As new research projects are proposed, the Mission-Aransas NERR will contact the Ranch Manager to discuss the project objectives and talk about issues such as Ranch access and installation equipment. At the completion of the project, researchers are responsible for providing both the Mission-Aransas NERR and Fennessey Ranch with access to any data collected or reports/publications.

6.0 Education

Implementation of educational programs at Fennessey Ranch also serves to increase the conservation value of the Ranch. Education programs could include formal education such as K-12 school groups and teacher trainings, as well as community education of families and target audiences such as master naturalists. Educational programs at the Ranch may include activities such as birding tours, hay rides, habitat hikes, star parties, and kayaking trips. These programs will serve to educate participants about the conservation value of the Ranch and the unique environments and biological process that occur there. Mission-Aransas NERR staff will contact the Ranch Manager before implementing any new educational programs.

7.0 Access Plan

Access and use of Fennessey Ranch is important to regulate. No activity, including ecotourism, is without impact on Fennessey Ranch. Careful observation must be conducted to ensure that simultaneous activities are not putting undue stress on Fennessey Ranch. For example, activities may need to be stopped for a period after heavy use.

Standard procedure for use of Fennessey Ranch must be followed for activities that occur without accompaniment by the Ranch Manager. Procedure for access includes:

1. Call Ranch Manager or Ranch Hand to inform of event and schedule date.
2. On the day of activity, sign in at the camp house and pin on the designated map the location of your activity.

Access may need to be controlled or restricted for sensitive areas and projects. All transportation must be conducted on designated roads and trails. If off-road transportation by motorized vehicle is required, any damage to the habitat (i.e. ruts) must be restored to its original state.



Appendix 1: Fennessey Ranch Conservation Easement



The University of Texas System
Nine Universities. Six Health Institutions. Unlimited Possibilities.

Real Estate Office
210 West 6th Street, Austin, Texas 78701
Phone: 512-499-4333 Fax: 512-499-4388

Writer's Direct Number: (512) 499-4517

Florence P. Mayne
Executive Director
fmayne@utsystem.edu

September 14, 2006

Mr. Brien O'Connor Dunn
c/o Mr. Delbert M. Cox
Scanio, Teer, Cox & Steele, LLP
602 Commerce
P. O. Box 1023
Refugio TX 78377

Re: Letter Agreement to Buy Conservation Easement on Fennessey Ranch in Refugio County, Texas

Dear Mr. Dunn:

On behalf of The Board of Regents of The University of Texas System, I am authorized to offer to buy the Easement as described below.

The following is a list of material transaction terms acceptable to Buyer:

1. Seller: Brien O'Connor Dunn
2. Buyer: The Board of Regents of The University of Texas System
3. Easement: A conservation easement (the "Easement") on the terms and conditions as set out in Exhibit A hereto, over and relating to the land, improvements, access rights, and mineral rights (to the extent owned by Seller) to the tract known as the Fennessey and located in Refugio County, Texas, and containing approximately 3,261.24 acres (the "Property"). The Easement has been appraised by a third-party professional appraiser to have a market value of \$3,170,000.00.
4. Purchase Price: \$3,170,000.00. Buyer will pay Seller the sum of \$1,585,000.00. Seller will donate the balance of the value of the easement as a gift to the University of Texas at Austin.
5. Payment Terms: all in cash at Closing
6. Inspection Period: none

www.utsystem.edu

Mr. Brien O'Connor Dunn

September 14, 2006

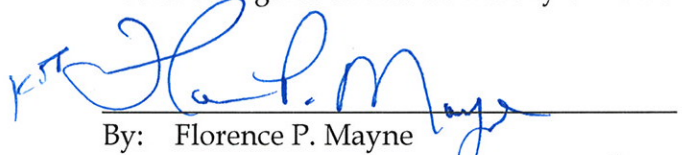
Page 2

7. Closing: Within five (5) days of receipt of a title commitment for insurance in the full appraised fair market value of the Easement (\$3,170,000.00) free of any Buyer objections and approval to fund from the National Oceanic and Atmospheric Administration, or as otherwise agreed by both parties.
8. Title Company: Refugio County Title Company.
9. Commissions: none
10. Use: Buyer is purchasing the Easement to protect the conservation values described in Exhibit A hereto, including the protection of freshwater flows into the Mission River in connection with the Mission-Aransas National Estuarine Research Reserve.
11. Closing Costs: Buyer may obtain, at its option and expense, a title policy covering the Property. Buyer will pay all costs of such title policy. Buyer and Seller will each bear their respective closing costs allocated as is usual and customary in Refugio County.

If the foregoing terms are acceptable to you, please so indicate by your signature below and return this document to my attention by September 20, 2006.

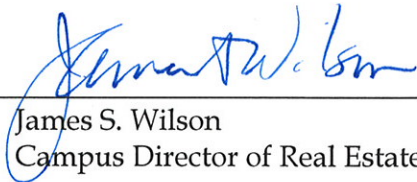
Sincerely,

Board of Regents of The University of Texas System



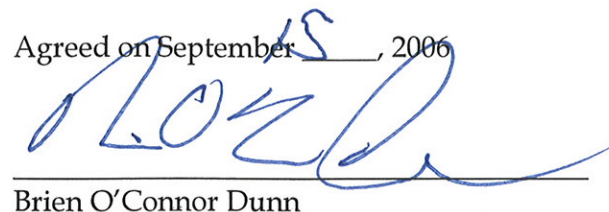
By: Florence P. Mayne
Executive Director, Real Estate Office

Approved as to Content:
The University of Texas at Austin



By: James S. Wilson
Campus Director of Real Estate

Agreed on September 15, 2006



Brien O'Connor Dunn

FENNESSEY RANCH CONSERVATION EASEMENT

STATE OF TEXAS §
COUNTY OF REFUGIO §

GRANT OF CONSERVATION EASEMENT

This Grant of Conservation Easement ("Conservation Easement") is made on this ____ day of _____, 2006, by Brien O'Connor Dunn, with an address of Fennessey Ranch, P.O. Box 99, Bayside, Texas, 78340 ("Grantor"), and The Board of Regents of The University of Texas System, an agency of the State of Texas, with an address of Real Estate Office, 210 W. Sixth Street, Austin, Texas 78701 ("Grantee").

R E C I T A L S:

A. The Grantor is the sole owner in fee simple of the property ("Property") legally described in Exhibit A, attached hereto and incorporated by this reference, which consists of approximately 3,261 acres located in Refugio County, State of Texas and is generally known as Fennessey Ranch.

B. The Property is a significant natural area that qualifies as a "...relatively natural habitat of fish, wildlife, or plants, or similar ecosystem," as that phrase is used in P.L. 96-541, 26 USC 170(h)(4)(A)(ii), as amended, and in regulations promulgated thereunder; specifically the Property is habitat for more than 400 species of birds, 16 plant communities, 50 kinds of amphibians and reptiles, 70 types of moths and butterflies, alligators, armadillo, deer, wild boar, coyotes, bobcats, and a resident cougar.

Preservation of the Property is pursuant to federal and state governmental conservation policy of the National Estuarine Research Reserve System and will yield a significant public benefit, by incorporation into the Mission-Aransas National Estuarine Research Reserve.

C. The characteristics of the Property, its current use and state of improvement, are described in a report entitled the Fennessey Ranch Management Plan (the "Management Plan"),

dated September 7, 2006, prepared by Grantee for the Grantor, incorporated herein by this reference. The Grantor worked with the Grantee to ensure that the Management Plan includes a complete and accurate description of the Property as of the date of this Conservation Easement. It will be used by the Grantor and Grantee to assure that any future changes in the use of the Property will be consistent with the terms of this Conservation Easement and its intended purposes. It is the Grantor's and Grantee's joint obligation to revise the Management Plan as needed, but not less frequently than every five years. Revisions of the Management Plan shall adhere to the purpose and conservation values stated herein. Revision of the Management Plan is subject to Grantor's and Grantee's mutual approval and the Grantor and Grantee each retain the right to include revisions to the Management Plan in accordance with the purposes and conservation values stated below. The Management Plan is not intended to preclude the use of other evidence to establish the present condition of the Property if there is a controversy over its use.

D. The Grantor and Grantee have the common purpose of conserving the below-described conservation values of the Property in perpetuity. The State of Texas has authorized the creation of Conservation Easements pursuant to Chapter 183 of the Texas Natural Resources Code, TEX. NAT. RES. CODE ANN. §§ 183.01, *et. seq.*, and Grantor and Grantee wish to avail themselves of the provisions of that law.

NOW, THEREFORE, the Grantor, for and in consideration of the facts recited above and of the mutual covenants, terms, conditions and restrictions contained herein, for the additional consideration of TEN DOLLARS (\$10.00) and other valuable consideration paid by Grantee to Grantor, and as an absolute and unconditional gift of the remaining value, hereby gives, grants, bargains, sells and conveys unto the Grantee a Conservation Easement in perpetuity over the Property. The Conservation Easement thereby granted is of the nature and character as follows:

1. **PURPOSE.** The purposes of this Conservation Easement are to ensure that the Property will be retained forever predominantly in its natural and scenic condition; to prevent any use of the Property that will significantly impair or interfere with the conservation values of the

Property described below; to assure the availability of the Property for historic uses that are compatible with the conservation values of the Property, such as the maintenance and replacement of existing structures and improvements, the construction of specific proposed structures, selective timber harvesting, ranching and farming of existing pastures and fields, hunting, research, educational, and eco-tourism uses; and to allow Grantee and its academic invitees, as managed by its component institution The University of Texas at Austin, to go onto and utilize the Property for scientific research and instruction consistent with the Management Plan.

Conservation values include the protection of native plants, animals, and plant communities on the Property; preservation of the estuarine areas and banks of the Mission River; preservation of the natural freshwater wetlands on the Property; preservation of the natural flow of fresh water from the artesian wells located on the Property; and the advancement and dissemination of man's understanding of the biology and hydrology of the Property and the adjacent Mission River.

Grantor will not perform, nor knowingly allow others to perform, any act on or affecting the Property that is inconsistent with the purposes of this conservation easement. However, unless otherwise specified below, nothing in this Conservation Easement shall require the Grantor to take any action to restore the condition of the Property after any act of God or other event over which Grantor had no control. Grantor understands that nothing in this Conservation Easement relieves him of any obligation or restriction on the use of the Property imposed by law.

2. **PROPERTY USES.** Any activity on or use of the Property inconsistent with the purposes of this conservation easement is prohibited. Without limiting the generality of the foregoing, the following is a listing of activities and uses which are expressly prohibited or which are expressly allowed. Grantor and Grantee have determined that the allowed activities do not impair the conservation values of the Property. Additional retained rights of Grantor are set forth in Paragraph 3 below.

2.1 Subdivision. The Property may not be divided, subdivided or partitioned, nor conveyed except in its current configuration as an entity.

- 2.2 Construction. Grantor, either directly, through the Fennessey Conservation Center of Excellence, or through other arrangements with educational institutions approved by Grantee in writing, shall have the right to construct a conservation or research center and dormitories at a mutually agreeable location within a site of 15 acres or less. Within such site, Grantor may construct driveways, utilities and a well to serve the center. The new construction shall be sited so as not to cause any significant disturbance to the conservation values of the Property. The location and design of the conservation or research center and dormitories shall be subject to written approval by the Grantee and Grantor. Other facilities, such as recreational courts, and educational boardwalks, observation towers, and nature trails shall be subject to written approval by the Grantee and Grantor. No other structures may be placed or constructed on the Property without the written approval of both Grantee and Grantor. Furthermore, there shall be no constructing or placing of any airplane landing strip, utility pole (other than those necessary to service the Property's improvements), utility tower, conduit or line on or above the Property. Outdoor lighting shall be placed and shielded so as to minimize the impact on surrounding areas.
- 2.3 Existing Improvements. Grantor shall have the right to maintain, remodel, and repair existing structures, water tanks, fences, corrals, water wells, header dams, utilities, and other improvements, and in the event of their destruction or obsolescence, to reconstruct or replace any such existing improvements with another of similar size, function, capacity, location and material.
- 2.4 Mineral Extraction. Extraction of subsurface minerals may be accomplished only by extraction methods that will have a limited and localized impact on, and not be irretrievably destructive of, the natural values of the Property and the conservation purposes of this easement. Without limiting the generality of the foregoing, minerals shall not be extracted by surface mining or by any subsurface mining in which any shafts are located on the surface of the Property. The extractor shall at all times use best efforts and practices to prevent damage or

impairment of natural values and shall restore any area damaged to its original condition. Nothing contained herein shall prevent the drilling of wells for the production of oil and gas from the Property, provided that any mineral lease granted by Grantor will obligate the lessee, or if there is no lease, Grantor will be obligated directly, to make all reasonable efforts to protect the natural condition of the Property in accordance with the conservation purposes of this Easement and to restore the Property to the condition in which it existed prior to the drilling.

- 2.5 Agricultural Use. Grantor shall have the right to plant and raise food plots in existing fields (33.3 acres) on the Property and perform primary processing, store and sell, including direct sales to the public, of crops and products (excluding timber) harvested and produced principally on the Property. Food plots may not exceed 50 acres in total and placement of food plots are subject to written approval by the Grantee. Grantor may not establish or maintain any commercial feedlot on the Property, which is defined for the purpose of this easement as a confined area or facility within which the land is not grazed or cropped at least annually and/or which is used to receive livestock that has been raised off the Property for feeding and fattening for market.
- 2.6 Timber Harvest. Grantor shall have the right to harvest timber from the Property in order to provide firewood for structures allowed on the Property and for maintaining allowed structures and improvements on the Property, such as residences, barn, corrals, fences, etc. No additional timber harvesting shall be allowed.
- 2.7 Grazing. Grantor shall have the right to graze and pasture animals pursuant to the Management Plan. Management of grazing, including the number and type of livestock and the grazing of riparian areas, shall be set by the Grantor and Grantee in the Management Plan, and shall be consistent with best grazing management practices. However, the Grantor shall always ensure that the Property is not overstocked or overgrazed, and that grazing does not cause or contribute to erosion of the banks of the Mission River. Management of grazing shall also ensure the

maintenance of a good quality mix of coastal prairie grasses, while protecting soil stability, water quality and other conservation values of the Property.

- 2.8 Home Businesses. Any business that is conducted by, and in the home of, a person residing on the Property, and does not create pollution, smoke, noxious odors or excessive noise, is allowed.
- 2.9 Recreational Uses. Grantor shall have the right to engage in and permit others to engage in recreational uses of the Property that require no surface alteration or other development of the land, including, without limitation, wildlife observation, nature photography and educational tours. Recreational uses that create excessive noise or pollution or that may damage or stress the land or plant and animal communities are forbidden.
- 2.10 Excavation. Except as necessary to accommodate the activities expressly permitted under this easement, there shall be no ditching, draining, diking, filling, excavating, dredging, removal of topsoil, sand, gravel, rock, minerals or other materials, mining, drilling or removal of minerals by surface mining, nor any building of roads or change in the topography of the Property or disturbance in the soil in any manner.
- 2.11 Destruction of Plants, Disturbance of Natural Habitat. Grantor shall have the right to conduct brush management, prescribed burns, range management, erosion control and archeological digs in accordance with the Management Plan. Grantor shall also have the right to cut and remove trees, shrubs or plants to accommodate the activities expressly permitted under this easement. Except as provided in Section 2.6, there shall be no additional removal, harvesting, destruction or cutting of native trees, shrubs or plants. Except for use around improvements or in gardens there shall be no planting of non-native trees, shrubs, or plants on the Property. Furthermore, except to accommodate the activities expressly permitted under this Conservation Easement, there shall be no use of fertilizers, plowing, introduction of non-native animals, or disturbance or change in the natural habitat in any manner, except as approved in the Management Plan.

- 2.12 Hydrology. Other than the repair or construction of wells necessary to serve allowed improvements, Grantee shall have the right to prevent or terminate any alteration, depletion or extraction of surface water, natural water courses, lakes, ponds, marshes, subsurface water or any other water bodies on the Property unless included within the Management Plan or otherwise approved by the Grantee. There shall be no commercial sales of water, including without limitation, groundwater. The Grantee retains the right to prohibit or restrict the pumping of water from wells if there is evidence of groundwater depletion or surface water impairment. No activities may be conducted on the Property that could alter the natural water level or flow in or over the Property. Notwithstanding the foregoing, the Management Plan may allow the manipulation of wetland areas as necessary to control invasive species or to foster the redevelopment of native species.
- 2.13 Signage. No signs or billboards or other advertising displays are allowed on the Property, except that signs whose placement, number and design do not significantly diminish the scenic character of the Property may be displayed to state the name and address of the Property and the names of persons living on the Property, to advertise or regulate permitted on-site activities, to advertise the Property for sale or rent, and to post the Property to control unauthorized entry or use.
- 2.14 No Biocides. There shall be no use of pesticides or biocides, including but not limited to insecticides, fungicides, rodenticides, and herbicides, except as approved by Grantee in writing according to the Management Plan to control invasive species detrimental to the conservation values of the Property, and except as reasonably needed around improvements on the Property and in existing food plots to control pests.
- 2.15 No Dumping. There shall be no storage or dumping of trash, garbage, or other unsightly or offensive material, hazardous substance, or toxic waste, nor any placement of underground storage tanks in, on, or under the Property; there shall be no changing of the topography through the placing of soil or other substance or

material such as land fill or dredging spoils, nor shall activities be conducted on the Property or on the adjacent property owned by Grantor, that could cause erosion or siltation on the Property.

- 2.16 No Pollution. Neither Grantor nor Grantee shall engage in any activities that cause pollution of surface water, natural water courses, lakes, ponds, marshes, subsurface water, or any other water bodies, nor shall activities be conducted on the Property that would be detrimental to water purity; provided that this section shall not prohibit any uses of the Property that are expressly permitted in this Agreement
- 2.17 Predator Control. Grantor shall have the right to control, destroy, or trap predatory and problem animals which pose a material threat to livestock and/or humans by means and methods approved by the Management Plan. The method employed shall be selective and specific to individuals, rather than broadcast, nonselective techniques.
- 2.18 Commercial Development. Any commercial or industrial use of or activity on the Property, other than those specifically permitted herein, is prohibited.
- 2.19 Development Rights. With the exception of the construction of improvements included in the Management Plan or otherwise permitted above, Grantor conveys to Grantee all developmental rights that are now or hereafter allocated to, implied, reserved or inherent in the Property, and the parties agree that such rights are terminated and extinguished, and may not be used or transferred to any portion of the Property, as it now or hereafter may be bounded or described, or to any other property adjacent or otherwise.
- 2.20 Hunting and Fishing. Hunting and fishing, whether by Grantor or by third-party lessees, shall occur only in accordance with the Management Plan. Hunting or fishing of species not expressly mentioned in the Management Plan may not occur unless they target invasive species or are given prior approval by the Grantee. There shall be no waterfowl hunting. Harvest limits for hunting and fishing shall be set by the Grantor annually based on monitoring and observation, and approved

by the Grantee with each revision of the Management Plan or with renewal of each lease.

3. **ADDITIONAL RIGHTS RETAINED BY GRANTOR.** Grantor retains the following additional rights:

- 3.1 Existing Uses. The right to undertake or continue any activity or use of the Property consistent with the conservation values expressed herein and not prohibited by this Conservation Easement. Prior to making any change in use of the Property, Grantor shall notify Grantee in writing to allow Grantee a reasonable opportunity to determine whether such change would violate the terms of this Conservation Easement.
- 3.2 Transfer. The right to sell, give, mortgage, lease, or otherwise convey the Property subject to the terms of this Conservation Easement. This Conservation Easement is and shall remain superior to any mortgage, lease, or other encumbrance of the Property.

4. **GRANTEE'S RIGHTS.** To accomplish the purpose of this Conservation Easement, the following rights are granted to Grantee by this Conservation Easement:

- 4.1 Right to Enforce. The right to preserve and protect the conservation values of the Property and enforce the terms of this Conservation Easement.
- 4.2 Right of Entry. The right of Grantee's staff, contractors and associated natural resource management professionals to enter the Property after prior notice to Grantor for the purposes of: (a) inspecting the Property to determine if Grantor is complying with the covenants and purposes of this Conservation Easement; (b) monitoring and research as described below; (c) conducting educational programs; and (d) managing exotic and invasive species as described in the Management Plan.
- 4.3 Monitoring and Research. The right, but not the obligation, to monitor the surface water, groundwater, plant and wildlife populations, plant communities, estuarine or riparian areas and natural habitats on the Property. Grantor shall cooperate with

Grantee in establishing, at no expense to Grantor, a written Monitoring and Research Plan to direct the monitoring of and research on plant and wildlife populations, plant communities, and natural habitats on the Property. Grantor agrees that all monitoring activity, natural resource inventory, and assessment work or other natural resource research, whether conducted by Grantor or others under Grantor's control, shall be reported to Grantee.

- 4.4 Management of Exotics and Invasive Species. The right, but not the obligation, to control, manage or destroy exotic non-native species or invasive species of plants and animals that threaten the conservation values of the Property. Grantee will consult with Grantor prior to implementing management activities, and except in extraordinary situations will act only to the extent the action is included in the Management Plan.
- 4.5 Right to Prevent Inconsistent Activity. The right, but not the obligation, to prevent any activity or use of the Property that is inconsistent with the purpose of this Conservation Easement and to restore or require the restoration of such areas or features of the Property that may be damaged by any inconsistent activity or use, pursuant to paragraph 7.
- 4.6 Research and Educational Activities. The right for Grantee and its academic invitees, as managed by its component institution The University of Texas at Austin, to go onto and utilize the Property for scientific research and instruction consistent with the Management Plan, and to construct and maintain necessary buildings, laboratories, offices, dormitories, and other facilities directly related to such research and instruction, with the consent and agreement of Grantor, which will not be unreasonably withheld. Grantee shall have the right to construct fences at its expense as necessary to exclude livestock from research areas.

5. RESPONSIBILITIES OF GRANTOR AND GRANTEE NOT AFFECTED. Other than as specified herein, this Conservation Easement is not intended to impose any legal or other

responsibility on the Grantor, or in any way to affect any existing obligation of the Grantor as owner of the Property. Among other things, this shall apply to:

(a) *Taxes* - The Grantor shall be solely responsible for payment of all taxes and assessments levied against the Property.

(b) *Upkeep and Maintenance* - The Grantor shall be solely responsible for the upkeep and maintenance of the Property, to the extent it may be required by law. The Grantee shall have no obligation for the upkeep or maintenance of the Property.

(c) *Grantee's Facilities* – Grantor shall be entitled to reasonable compensation (rent) for any improvements constructed by or for Grantee on the Property, which shall cover all taxes, upkeep, and maintenance thereon.

5.1 Notice of Intent to Undertake Certain Permitted Actions. The purpose of requiring Grantor to notify Grantee prior to undertaking certain permitted activities herein is to afford Grantee the opportunity to ensure that the activities in question are designed and carried out in a manner consistent with the purpose and conservation values of this Conservation Easement. Whenever notice is required, Grantor shall notify Grantee not less than 30 days prior to the date Grantor intends to undertake the activity in question. The notice will describe the nature, scope, design, location, timetable, and any other material aspect of the proposed activity in sufficient detail to permit Grantee to make an informed judgment as to its consistency with the purpose of this easement.

6. **NO PUBLIC ACCESS.** No right of access by the general public to any portion of the Property is conveyed by this Conservation Easement. However, the public has the right to view the Property from adjacent publicly accessible areas such as public roads and waterways.

7. **ENFORCEMENT.** The Grantee shall have the right to prevent and correct violations of the terms of this Conservation Easement. Grantee may enter the Property for the purpose of inspecting for violations. If the Grantee finds conditions or activities constituting a violation, whether in the course of such inspections or otherwise in its use of the Property, it may at its

discretion take appropriate legal action or take such other steps as it deems necessary to prevent the loss of value of this Conservation Easement. Except when an ongoing or imminent violation could substantially diminish or impair the conservation values of the Property, the Grantee shall give the Grantor written notice of the violation and sixty (60) days to correct it (or to begin good faith efforts to correct in the event the violation is something which cannot be reasonably corrected in sixty days) before filing any legal action. If a court with jurisdiction determines that a violation may exist or has occurred, the Grantee may obtain an injunction to stop it, temporarily or permanently, and require the Grantor to restore the Property to its condition prior to the violation. The failure of the Grantee to discover a violation or to take immediate legal action shall not bar it from doing so at a later time. In the event of violation of the terms and conditions of this Conservation Easement by Grantor, any costs incurred by Grantee, including reasonable attorney's fees, in enforcing this Conservation Easement against Grantor, and including any costs of restoration necessitated by Grantor's acts or omissions in violation of the terms of this Conservation Easement, shall be reimbursed by Grantor to Grantee.

8. **TRANSFER OF EASEMENT.** The parties recognize and agree that the benefits of this Conservation Easement are in gross and assignable. The Grantee shall have the right to transfer or assign this Conservation Easement to any public agency or qualified institution that at the time of transfer, is a "qualified organization" under Section 170(h) of the U.S. Internal Revenue Code, and the organization expressly agrees to assume the responsibility imposed on the Grantee by this Conservation Easement. If the Grantee ever ceases to exist or no longer qualifies under Sec. 170(h) or applicable state law, a court with jurisdiction shall transfer this easement to another qualified organization having similar purposes that agrees to assume the responsibility.

9. **TRANSFER OF PROPERTY.** Any time the Property, or any interest therein, is transferred by the Grantor to any third party, the Grantor shall notify the Grantee in writing at least thirty (30) days prior to the transfer of the Property, and the document of conveyance shall expressly refer to this Conservation Easement and make the conveyance subject and subordinate to this Conservation Easement.

10. **AMENDMENT OF EASEMENT.** This Conservation Easement may be amended only with the written consent of Grantor and Grantee. Any such amendment shall be consistent with the purposes of this Conservation Easement and shall comply with Sec. 170(h) of the Internal Revenue Code (as it may be amended from time to time), or any regulations promulgated in accordance with that section. Any such amendment shall also be consistent with Chapter 183 of the Texas Natural Resources Code (as it may be amended from time to time), or any regulations promulgated pursuant to that law. The Grantor and Grantee have no right or power to agree to any amendment that would affect the enforceability of this Conservation Easement.

11. **TERMINATION OF EASEMENT.** If it is determined that conditions on or surrounding the Property have changed so much that it is impossible to fulfill the conservation purposes set forth above, a court with jurisdiction may, at the joint request of both the Grantor and Grantee, terminate this Conservation Easement.

If condemnation of a part of the Property or of the entire Property by public authority renders it impossible to fulfill any of these conservation purposes, the Conservation Easement may be terminated through condemnation proceedings.

If the easement is terminated and the Property is sold or taken for public use, then, as required by Sec. 1.170A-14(g)(6) of the IRS regulations (as it may be amended from time to time), the Grantee shall be entitled to 57.64% of the gross sale proceeds or condemnation award, this being equal to the ratio of the appraised value of this easement to the unrestricted fair market value of the Property, as these values are determined on the date of this Conservation Easement. The Grantee shall use no less than one-half (1/2) of the proceeds consistently with the conservation purposes of this Conservation Easement.

12. **INTERPRETATION.** This Conservation Easement shall be interpreted under the laws of Texas, resolving any ambiguities and questions of the validity of specific provisions so as to give maximum effect to its conservation purposes.

13. **INDEMNIFICATION.** Each party agrees to release, hold harmless, defend and indemnify the other party from any and all liabilities that the indemnified party may suffer or incur as a result of or arising out of the other party's negligence or willful misconduct in connection with their activities on the Property including, but not limited to, injury, losses, damages, judgments, costs, expenses and fees. The Grantee's indemnity to the Grantor is further limited by the laws and Constitution of the State of Texas.

14. **TITLE.** The Grantor covenants and represents that the Grantor is the sole owner and is seized of the Property in fee simple and has good right to grant and convey this Conservation Easement; that the Property is free and clear of any and all encumbrances, including but not limited to, any mortgages not subordinated to this Conservation Easement, and that the Grantee shall have the use of and enjoy all of the benefits derived from and arising out of this Conservation Easement.

15. **NOTICES.** Any notices required by this Conservation Easement shall be in writing and shall be personally delivered or sent by first class mail, to Grantor and Grantee, respectively, at the following addresses, unless a party has been notified by the other of a change of address.

To Grantor:

Brien O'Connor Dunn
Fennessey Ranch
P.O. Box 99
Bayside, Texas 78340

To the Grantee:

University of Texas at Austin
Marine Science Institute
750 Channel View Drive
Port Aransas, Texas 78373

University of Texas System
Office of General Council
201 West 7th Street
Austin, TX 78701-2982

University of Texas System
U.T. System Real Estate Office
210 West 6th Street
Austin, TX 78701-2980

University of Texas at Austin
Vice President and CFO
P. O. Box 8179
Austin, TX 78713-8179

16. **ENVIRONMENTAL CONDITION.** The Grantor warrants that he has no actual knowledge of a release or threatened release of hazardous substances or wastes on the Property.

17. **SEVERABILITY.** If any provision of this Conservation Easement is found to be invalid, the remaining provisions shall not be altered thereby.

18. **PARTIES.** Every provision of this Conservation Easement that applies or refers to the Grantor or Grantee shall also apply or refer to their respective heirs, executors, administrators, assigns, and all other successors as their interest may appear.

19. **RECORDING.** In order to ensure the perpetual enforceability of the Conservation Easement, the Grantee is authorized to record this instrument or any other appropriate notice or instrument.

20. **MERGER.** The parties agree that the terms of this Conservation Easement shall survive any merger of the fee and easement interest in the Property.

21. **SUBSEQUENT LIENS ON PROPERTY.** No provisions of this Conservation Easement will be construed as impairing the ability of Grantor to use this Property as collateral for subsequent borrowing, provided that any mortgage or lien arising from such a borrowing is subordinate to this Conservation Easement.

22. **FEDERAL LIENS ON EASEMENT INTEREST.** No provisions of this Conservation Easement will be construed as impairing the ability of Grantee to grant an interest in this easement to the United States of America should this be a requirement of receiving Federal funding that advances the purchase or the purpose of the easement. Grantor expressly consents to such grant.

23. **ACCEPTANCE & EFFECTIVE DATE.** As attested by the Board of Regents of The University of Texas System and the signature of its authorized representative affixed hereto, the Grantee hereby accepts without reservation the rights and responsibilities conveyed by this Conservation Easement. This Conservation Easement is to be effective the date recorded in the Refugio County Registry of Deeds.

TO HAVE AND TO HOLD this Grant of Conservation Easement unto the Grantee, its successors and assigns, forever. Grantor hereby binds Grantor and Grantor's successors to WARRANT and FOREVER DEFEND, all and singular, the Conservation Easement to Grantee and Grantee's successors and assigns, against every person whomsoever lawfully claiming or to claim the same or any part thereof.

IN WITNESS WHEREOF, the Grantor and Grantee, intending to legally bind themselves, have set their hands on the date first written above.

GRANTOR:
BRIEN O'CONNOR DUNN

GRANTEE:
THE BOARD OF REGENTS OF THE
UNIVERSITY OF TEXAS SYSTEM

By: _____
Florence P. Mayne
Executive Director, Real Estate Office

STATE OF TEXAS §
COUNTY OF CAMERON §

BEFORE ME, the undersigned authority, on this day personally appeared _____, known to me to be the person whose name is subscribed to the foregoing instrument, who acknowledged that he executed the same for the purposes and consideration therein stated, individually and in the capacity above stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the ____ day of _____, 2006_____.

_____(SEAL)
NOTARY PUBLIC

My commission expires:

STATE OF TEXAS §
COUNTY OF TRAVIS §

BEFORE ME, the undersigned authority, on this day personally appeared Florence P. Mayne, as Executive Director of Real Estate of The University of Texas System, for and on behalf of the Board of Regents of the University of Texas System, known to me to be the person whose name is subscribed to the foregoing instrument, who acknowledged that she executed the same for the purposes and consideration therein stated, in the capacity above stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the ____ day of _____, 2006.

_____(SEAL)
NOTARY PUBLIC

My commission expires:

EXHIBIT A
PROPERTY DESCRIPTION

That land located in Refugio County, Texas, more particularly described as follows:

3,261.24 acres of land, more or less, out of the Refugio Town Tract, A-56, the G. W. Archer Survey, A-74, the G. W. Archer Survey, A-75, the Heirs of Chas Haskell Survey, A-157, the Heirs of Chas Haskell Survey, A-169, the T. W. Johnson Survey, A-201, and the Martin Toole Survey, A-347. Said 3,261.24 acres is a part of Share One of 3,835.38 acres set aside to Brien O'Conner Dunn, et al. by Partition Deed dated August 22, 1986, recorded in Volume 302, Page 443 of the Deed Records of Refugio County, Texas, and is all of said 3,835 acres SAVE AND EXCEPT that certain 574.14 acre tract conveyed by Brien O'Conner Dunn to Marie O'Connor Sorenson by deed dated December 1, 1998, recorded in Volume 94, Page 290, Deed Records of Refugio County Texas; along with all gores, strips, and adjacent tracts owned by the Grantor, and as the same may be modified from time to time by accretion or erosion.

This conveyance is subject to all lawful restrictive covenants and easements, if any, of record in the office of the County Clerk of the County in which said land is located and presently in force and affecting said land. There is also excepted herefrom all oil, gas, and other minerals, if any, heretofore conveyed to others or reserved by Grantor's predecessors in title as shown by the records of said Clerk.

Share One of 3,835.38 acres set aside to Brien O'Conner Dunn, et al. by Partition Deed dated August 22, 1986, recorded in Volume 302, Page 443 of the Deed Records of Refugio County, Texas is described in more detail below:

Being 3835.38 acres of land out of the Mary Ellen O'Connor trust land near Refugio, in Refugio County, Texas, and is a part of the original 2271.2 acres conveyed by Mrs. Mary Ellen O'Connor to T.J. O'Connor by Partition Deed dated October 22, 1924, recorded in Volume 6, Page 246, a tract of 78.24 acres conveyed by Joe St. John et al to T.J. O'Connor by deed dated May 2, 1926, recorded in Volume 10, Page 103, Deed Records, less 83.73 acres conveyed by T.J. O'Connor to Joe St. John et al, by deed dated April 20, 1927, recorded in Volume 10, Page 102, Deed Records of Refugio County, Texas, and part of 3723 acres conveyed by Mrs. Mary Ellen O'Connor to Mary Ellen O'Connor by Partition Deed dated October 22, 1924, as recorded in Volume 6, Page 255, Deed Records of Refugio County, Texas, and consists of the following pastures:

Fennessey Pasture 2,999.20 acres
Sendero Pasture 574.14 acres
St. John Trap 262.04 acres
Total 3,835.38 acres

and also consists of land out of the following surveys:

ABSTRACTS	SURVEY	ACRES
56	Refugio Town Tract	326.85
74	G.W. Archer	575.90
75	G.W. Archer	656.26
157	Heirs of Chas. Haskell	364.55
169	Heirs of Chas. Haskell	1,304.70
201	T.W. Johnson	331.17
257	H. Rose	66.95
347	Martin Toole	168.21
388	Day Land and Cattle Co.	<u>40.79</u>
	Total	3,835.38

and is more particularly described by metes and bounds as follows, to wit:

Beginning in the center of Dry Bayou at the southwest corner of said 83.73 acres conveyed by T.J. O'Connor to Joe St. John et al (now owned by Jim Watts) for the northwest corner of the St. John Trap and the northwest corner of this survey;

Thence, S. 80 deg. 35' E., with a fence on the south line of said 83.73 acre tract, 804 varas to a 1" iron pipe set in a fence corner in the west right-of-way line of F. M. Highway 2678 for the southeast corner of said 83.73 acre tract and the northeast corner of this survey;

Thence with the deflections of the west right-of-way line of said Highway as follows:

S. 8 deg. 20' W., 93.8 varas to a concrete monument, Highway right-of-way marker;

S. 6 deg. 48' W., 891 varas to a concrete monument, Highway right-of-way marker at the beginning of a curve to the left; S. 4 deg. 40' W., 142.6 varas; S. 1 deg. 20' W., 100 varas;

S. 1 deg. 20' E., 100 varas; S. 4 deg. 10' E., 100 varas; S. 7 deg. 00' E., 101 varas, a 1" iron pipe at the southeast corner of the St. John Trap and northeast corner of the Fennessey Pasture;

S. 8 deg. 37' E., 84.8 varas; S. 12 deg. 00' E., 100 varas; S. 14 deg. 45' E., 100 varas; S. 17 deg. 34' E., 100 varas; 5. 20 deg. 10' E., 83 varas; S. 22 deg. 37' E., 100 varas; S. 25 deg. 18' E., 100 varas to a concrete monument Highway right-of-way marker at the end of said curve;

S. 26 deg. 40' E., 791 varas to a 1" iron pipe set in the western right-of-way line of F.M. Highway 2678 at its intersection with the northwest line of 381.53 acres of land conveyed by Thos. M. O'Connor et al to Mary Vivian O'Connor Dunn by Partition Deed dated December 31, 1954, described as schedule "C" in Volume 93, Page 60, Deed Records of Refugio County, Texas, the southwest corner of a 2887.80 acre tract, Share Two of this partition, and a corner of this survey;

Thence, S. 41 deg. 35' W., with the northwest line of Dunn's land, 151 varas to a 8" x 8" concrete monument in a fence in the west line of some stock pens for the west corner of Dunn's 381.53 acre tract and corner of this survey;

Thence, S. 76 deg. 36' E., with the south line of said Dunn tract and Thos. M. O'Connor 381.53 acre tract, through some stock pens, at 182 varas pass a 1" iron pipe in the west right-of-way line of F.M. Highway 2678, at 238.4 varas cross the east right-of-way line of said Highway, at 2092.6 varas pass a concrete monument at Dunn's southeast corner and Thos. M. O'Connor's southwest corner, at 2930.9 varas in all to a 8" x 8" concrete block in a fence corner for the northwest corner of 5319.5 acres

conveyed by Mrs. Mary Ellen O'Connor to Lawrence W. O'Connor by deed dated October 22, 1924, as recorded in Volume 6, Page 250, Deed Records of Refugio County, Texas, for the most easterly northeast corner of this survey;

Thence, S. 0 deg. 24' W., with a fence on the west line of said 5319.5 acre tract, 611.9 varas to a 8" x 8" concrete block in a fence corner for a corner of said 5319.5 acre tract and a corner of this survey;

Thence, S. 78 deg. 28' W., with a fence on a line of said 5319,5 acre tract 180.3 varas to an iron pipe in a fence corner for a corner of same and a corner of this survey;

Thence, S. 25 deg. 24' W., with a line of said 5319.5 acre tract, 185.7 varas to a 8" x 8" concrete block in a fence for a corner of same and a corner of this survey;

Thence, S. 50 deg. 52' W., with a fence on the northwest line of said 5319.5 acre tract, at 1396.3 varas pass a 1" iron pipe in the west right-of-way line of F.M. Highway 2678, at a total distance of 1946.3 varas to an iron pipe in fence corner for a corner of said 5319.5 acre tract and a corner of this survey;

Thence, S. 31 deg. 00' W., with a line of said 5319.5 acre tract, 64 varas to a stake on the low bank of Mission River for the northwest corner of said 5319.5 acre tract, and the southeast corner of this survey;

Thence, with the meanders of Mission River upstream as follows, as the same may be modified from time to time by accretion or erosion:

N. 56 deg. 43' W., 23 varas; N. 73 deg. 40' W., 109 varas; S. 72 deg. 50' W., 98 varas; S. 49 deg. 30' W., 99 varas; S. 41 deg. 15' W., 100 varas; S. 34 deg. 45' W., 45 varas; S. 35 deg. 15' W., 100 varas; S. 42 deg. 40' W., 194 varas; S. 48 deg. 10' W., 150 varas; S. 51 deg. 05' W., 104 varas; S. 48 deg. 50' W., 91 varas; S. 42 deg. 46' W., 236.1 varas; S. 41 deg. 11' W., 37.4 varas; S. 43 deg. 21' W., 74.2 varas; S. 44 deg. 32' W., 63 varas; S. 43 deg. 41' W., 67 varas; S. 44 deg. 26' W., 72.4 varas; S. 54 deg. 26' W., 73.1 varas; S. 63 deg. 00' W., 82.1 varas; S. 59 deg. 33' W., 54.4 varas; S. 59 deg. 15' W., 76.3 varas; S. 45 deg. 44' W., 72 varas; S. 43 deg. 38' W., 56.9 varas; S. 26 deg. 12' W., 67.7 varas; S. 20 deg. 40' W., 73.1 varas; S. 15 deg. 45' W., 55.1 varas; S. 15 deg. 38' W., 59 varas; S. 14 deg. 27' W., 74.2 varas; S. 16 deg. 33' W., 79.9 varas; S. 18 deg. 57' W., 57.2 varas; S. 21 deg. 19' W., 75.6 varas; S. 19 deg. 11' W., 49.7 varas; S. 26 deg. 14' W., 72 varas; S. 20 deg. 08' W., 72 varas; S. 15 deg. 53' W., 72.4 varas; S. 20 deg. 59' W., 72 varas; S. 21 deg. 01' W., 72 varas; S. 29 deg. 58' W., 73.8 varas; S. 33 deg. 39' W., 77.8 varas; S. 42 deg. 37' W., 71.6 varas; S. 39 deg. 21' W., 75.6 varas; S. 39 deg. 52' W., 74.9 varas; S. 52 deg. 17' W., 72.4 varas; S. 58 deg. 01' W., 72 varas; S. 62 deg. 34' W., 72.4 varas; S. 63 deg. 26' W., 72.7 varas; S. 68 deg. 43' W., 73.4 varas; S. 69 deg. 46' W., 74.2 varas; S. 66 deg. 50' W., 70.2 varas; S. 73 deg. 46' W., 35.3 varas; N. 89 deg. 04' W., 55.4 varas; N. 78 deg. 44' W., 25.2 varas; N. 59 deg. 09' W., 81.7 varas; N. 43 deg. 02' W., 72.7 varas; N. 47 deg. 31' W., 72 varas; N. 57 deg. 32' W., 72.4 varas; N. 58 deg. 58' ; W., 72.4 varas; N. 58 deg. 36' W., 35.3 varas; N. 41 deg. 49' W., 46.8 varas; N. 20 deg. 34' W., 21.6 varas; N. 20 deg. 55' W., 72 varas; N. 15 deg. 17' W., 77 varas; N. 7 deg. 11' W., 78.8 varas; N. 5 deg. 15' E., 46.1 varas; N. 14 deg. 56' E., 32.4 varas; N. 22 deg. 54' E., 54.7 varas; N. 38 deg. 56' E., 74.9 varas; N. 48 deg. 56' E., 34.9 varas; N. 57 deg. 26' E., 72.4 varas; N. 70 deg. 02' E., 72.7 varas; N. 68 deg. 51' E., 72.4 varas; N. 55 deg. 42' E., 52.9 varas; N. 31 deg. 56' E., 32 varas; N. 2 deg. 18' W., 60.8 varas; N. 35 deg. 35' W., 73.4 varas; N. 56 deg. 44' W., 61.6 varas; N. 69 deg. 26' W., 74.9 varas; N. 73 deg. 46' W., 72.4 varas; N. 72 deg. 49' W., 35.3 varas; N. 66 deg. 15' W., 182 varas; N. 75 deg. 00' W., 45 varas; S. 78 deg. 15' W., 70 varas; S. 51 deg. 15' W., 99 varas; S. 47 deg. 50' W., 95 varas; S. 61 deg. 30' W., 95 varas; N. 58 deg. 45' W., 100 varas; N. 2 deg. 45' W., 95 varas; N. 3 deg. 35' E., 247 varas; N. 14 deg. 25' W., 159 varas; N. 24 deg. 30' W., 100 varas; N. 31 deg. 25' W., 87 varas; N. 37 deg. 30' W., 100 varas; N. 38 deg. 55' W., 111 varas; N. 29 deg. 40' W., 139 varas; N. 22 deg. 15' W., 100 varas; N. 26 deg. 50' W., 108 varas; N. 5 deg. 55' W., 344 varas; N. 7 deg. 40' W., 254 varas; N. 13 deg. 53' W., 201.6 varas; N. 16 deg. 25' W., 173 varas; N. 16 deg. 55' W., 187 varas; N. 23 deg. 50' W., 191 varas; N. 39 deg. 55' W., 95 varas; N. 51 deg. 40' W., 197 varas; N. 55 deg. 15' W., 162 varas; N. 63 deg. 35' W., 169 varas; N. 69 deg. 00' W., 177 varas; N. 2 deg. 45' W., 62 varas; N. 60 deg. 05' E., 77 varas; N. 83 deg. 20' E., 138 varas; N. 34 deg. 55' E., 71 varas; N. 25 deg.

20' W., 68 varas; N. 36 deg. 40' W., 118 varas; N. 5 deg. 20' W., 94 varas; N. 13 deg. 40' E., 105 varas; N. 87 deg. 20' E., 68 varas; S. 52 deg. 15' E., 133 varas; S. 31 deg. 05' E., 79 varas; S. 44 deg. 25' E., 112 varas; S. 73 deg. 20' E., 101 varas; N. 72 deg. 30' E., 125 varas; N. 50 deg. 05' E., 85 varas; N. 26 deg. 35' E., 127 varas; N. 16 deg. 55' E., 120 varas; N. 58 deg. 30' E., 108 varas; N. 71 deg. 20' E., 81 varas; N. 88 deg. 55' E., 87 varas; S. 59 deg. 45' E., 89 varas; S. 35 deg. 05' E., 204 varas; S. 46 deg. 40' E., 79 varas; S. 77 deg. 20' E., 95 varas; S. 88 deg. 10' E., 133 varas; N. 79 deg. 00' E., 100 varas; N. 61 deg. 25' E., 91 varas; N. 46 deg. 55' E., 124 varas; N. 42 deg. 59' E., 177.2 varas; N. 38 deg. 23' E., 108 varas; N. 35 deg. 28' E., 90 varas; N. 35 deg. 52' E., 110.2 varas; N. 32 deg. 18' E., 103.0 varas; N. 31 deg. 40' E., 91.8 varas; N. 30 deg. 38' E., 96.8 varas; N. 32 deg. 03' E., 104.0 varas; N. 26 deg. 40' E., 100.1 varas; N. 25 deg. 25' E., 100.1 varas; N. 18 deg. 07' E., 101.9 varas; N. 20 deg. 39' E., 44.6 varas; N. 19 deg. 26' E., 95.0 varas; N. 20 deg. 14' E., 100.1 varas; N. 16 deg. 33' E., 99.4 varas; N. 18 deg. 26' E., 100.1 varas; N. 21 deg. 09' E., 112.0 varas; N. 19 deg. 32' E., 100.4 varas; N. 17 deg. 40' E., 100.1 varas; N. 9 deg. 57' E., 101.9 varas; N. 19 deg. 20' E., 30.2 varas; N. 13 deg. 01' E., 96.8 varas; N. 8 deg. 30' E., 47.2 varas; N. 8 deg. 17' E., 100.1 varas; N. 22 deg. 46' E., 41.9 varas; N. 13 deg. 25' W., 96.8 varas; N. 7 deg. 16' W., 77 varas; N. 16 deg. 56' W., 98.6 varas; N. 25 deg. 49' W., 22.3 varas; N. 26 deg. 42' W., 92.5 varas; N. 28 deg. 31' W., 82.1 varas to the northwest corner of the Fennessey Pasture and the southwest corner of the St. John Trap;

N. 29 deg. 40' W., 86.9 varas; N. 28 deg. 20' W., 109 varas; N. 20 deg. 45' W., 101 varas; N. 14 deg. 25' W., 70 varas; N. 10 deg. 55' W., 102 varas; N. 5 deg. 37' W., 176 varas; N. 2 deg. 05' W., 95 varas; N. 3 deg. 35' E., 93 varas; N. 7 deg. 35' E., 87 varas; N. 13 deg. 00' E., 76 varas; N. 11 deg. 15' E., 78 varas; N. 10 deg. 30' E., 72 varas; N. 11 deg. 40' E., 46 varas; N. 15 deg. 50' W., 37 varas to the center of the mouth of Dry Bayou;

Thence with the meanders of the center of the Dry Bayou upstream as follows, as the same may be modified from time to time by accretion or erosion:

N. 1 deg. 00' E., 58 varas; N. 29 deg. 40' W., 74 varas; N. 5 deg. 10' E., 21 varas; N. 35 deg. 40' E., 43 varas; N. 26 deg. 50' E., 84 varas; N. 48 deg. 21' E., 50.9 varas; N. 54 deg. 20' E., 58 varas; N. 67 deg. 15' E., 97 varas; N. 51 deg. 29' E., 52 varas to the Place of the Beginning, containing 3835.38 acres of land, more or less, of which 20.23 acres lies in the right-of-way of F.M. Highway No. 2678.

Appendix 2: Pipeline Easement

inches (24”) in outside diameter and any appurtenant facilities in, over, through, across, under, and along land that is also described and depicted in the attached Exhibits A and B owned by the Grantor. The term of this Temporary Construction Easement shall be for a period to extend twenty-four (24) months from the date of construction commencement. However, if Grantee has completed its use of this Temporary Construction Easement prior to the twenty-four (24) month period and so states in writing, then the Temporary Construction Easement shall immediately terminate. Where used herein, the term “Easement Property” shall refer to the Permanent Easement Property, the Temporary Construction Easement, and all other portions of Grantor’s property used as provided below from time to time by Grantee.

The easement herein granted shall be upon the following terms and conditions, which shall be considered as covenants running with the estate hereby granted, and which covenants the GRANTEE binds and obligates itself, its successors and assigns, to observe and perform:

TERM OF EASEMENT

(1) This Agreement shall remain in full force and effect for a period of two (2) years from the Effective Date and for so long thereafter as GRANTEE continually utilizes the Pipeline for the transportation of natural gas ONLY through the Pipeline without a cessation for more than two years.

ABOVE GROUND APPURTENANCES

(2) Other than the two valve sites (one on each side of the Mission River crossing) which are required by law, no above-ground appurtenances, valves or other facilities shall be constructed or operated without GRANTOR’S written consent except pipeline markers, cathodic protection test leads, markers marking the crossing of pipelines, and vent pipes. Any above ground appurtenances, valves or other facilities constructed or operated by GRANTEE shall be properly fenced and marked to avoid damage to vehicles, equipment, or livestock. GRANTEE shall keep the area around any fenced facility clear of all weeds and grass.

BURYING PIPELINE

(3) GRANTEE shall bury said pipeline at least thirty-six inches (36") beneath the surface of the earth using methods as restricted below. In constructing, maintaining, operating and removing said pipeline, the GRANTEE shall so construct, maintain and operate the same so as to prevent the erosion of soil resulting therefrom both within the boundary of said easement and outside the boundary thereof. In addition, where the GRANTEE'S pipeline crosses over, through or under any existing drainage ditches, canals, creeks, rivers, wetlands, sloughs or other waterways on the GRANTOR'S property, such pipeline shall be laid at least thirty-six inches (36") below the bottom of such ditches, canals, creeks, rivers, wetlands, sloughs or other waterways and the GRANTEE shall be obligated to restore such drainage ditches, canals, creeks, rivers, wetlands, sloughs or other waterways to the same degree of slope and depth as the same exists at the time GRANTEE lays its pipeline. GRANTEE shall fully restore all private roads, drainage and irrigation ditches, canals, creeks, rivers, wetlands, sloughs or other waterways to the extent disturbed by GRANTEE'S construction operations to their condition prior to such construction, and during construction shall provide GRANTOR access across the easement where the same crosses private roads. GRANTEE shall also provide access across the easement for GRANTOR'S cattle.

RESTORATION OF SURFACE

(4) In constructing, maintaining, repairing or removing said pipeline, GRANTEE obligates itself to fill in all ditches or depressions occasioned thereby as soon as reasonably possible, and to restore the surface of the land as nearly as may be possible to the same condition that prevailed at the time of the construction of the line, and to maintain such refilling and restoring operations until such time as the surface of the land has settled uniformly with the

surface of the adjoining lands. In environmentally sensitive areas as designated in Exhibit C, Grantee shall replant vegetation so as to restore any disturbed areas to the condition in which they were prior to disturbance in consultation with the holder of the Fennessey Ranch Conservation Easement referenced below. On pasture land, all disturbed area in the Easement Property will be disced, leveled, fertilized and seeded with a mixture of native seed comparable to that determined to be in existence on the Easement Property at the beginning of construction. However, prior to seeding, Grantor may request a particular seeding mixture in consultation with the holder of the Fennessey Ranch Conservation Easement referenced below. If such a request is made by Grantor, Grantee may either reseed with the mixture of Grantor's choice or pay Grantor \$300.00 per acre so that Grantor may reseed the Easement Property.

REMOVAL OF PIPELINE

(5) Upon the cessation of use of such pipeline, as hereinabove provided, and upon the termination of this easement, GRANTEE shall have the right to remove the pipeline within six (6) months after termination, but if not removed by GRANTEE then it shall be deemed that GRANTEE has abandoned in place the pipeline and that title to such pipeline has become vested in the GRANTOR, GRANTOR'S heirs and assigns; provided, however, that if GRANTOR requests that all or part of the pipeline be removed within twelve (12) months after such termination, GRANTEE shall remove all or part of the pipeline as requested and restore the surface as provided in Paragraph (4) above.

DAMAGES

(6) (a) The consideration hereinabove recited is solely for the grant of the easement for such pipeline and for all reasonable damages necessarily caused to the GRANTOR'S land in connection with the laying and construction of the pipeline, but such consideration does not

cover any damages which may accrue to the GRANTOR, or GRANTOR'S tenants, for any damage to growing crops, range pasture land, fences, trees, environmentally sensitive areas including riparian zones and wetlands areas designated in Exhibit C, livestock, personal property, plowed lands, irrigation installations, roads, culverts, gates, cattleguards and other improvements, or any future damages by reason of the maintenance, repair, operation or removal of such pipeline, or any other damages which may result from the exercise of any of the rights and privileges hereby granted to GRANTEE herein, and GRANTEE shall pay all other damages within a reasonable time as they may accrue. For the purpose of this easement a "reasonable time" shall be construed to mean not more than sixty (60) days after GRANTEE receives notice and proof of such damages.

(b) Damages for Trees: It is expressly provided that GRANTEE will use reasonable efforts to limit the destruction of or damage to any desirable trees on said lands. However, should any live oak, post oak, anaqua, or pecan trees off of the Easement Property be destroyed or substantially damaged, without the consent of the surface owner or their agent, then GRANTEE agrees to pay the surface owner the sum shown below for each tree destroyed or substantially damaged. Such sum shall be payable in Refugio County, Texas, not later than thirty (30) days after such destruction or damage occurs. The amount to be paid for tree damages is as follows:

Trees 6" to 12" in diameter at 4.5' above the ground	\$1,000.00
Trees 12" to 24" in diameter at 4.5' above the ground	\$2,500.00

If any Oaks in excess of 24" in diameter at 4.5' above the ground are damaged or removed, GRANTEE shall pay Grantor \$500.00 per inch of diameter measured four and a half feet above the ground. The tree damages shall be paid within 30 days after clearing of the trees is substantially complete. Any trees dying within three years after being damaged by

GRANTEE shall be paid for as provided above, within 30 days after notification to GRANTEE by GRANTOR.

POLES

(7) GRANTEE shall not erect or operate any telephone poles, telegraph poles or other surface poles along the pipeline easement herein granted.

FIREARMS, DRUGS AND ALCOHOL

(8) GRANTEE agrees that it will not permit its agents, servants or employees to use, take or carry firearms, illegal drugs or alcohol of any kind or character on the said easement hereby granted, or the adjacent lands of the GRANTOR, or any part thereof, nor will it permit the said premises to be used as a means of entry by its agents, servants, or employees to other lands owned by GRANTOR herein, for any purposes whatsoever.

INDEMNITY

(9) GRANTEE AGREES TO AND SHALL INDEMNIFY AND HOLD HARMLESS GRANTOR, GRANTOR'S TENANTS, HEIRS, SUCCESSORS AND ASSIGNS, THE HOLDER OF THE FENNESSEY RANCH CONSERVATION EASEMENT DESCRIBED IN NUMBERED PARAGRAPH 14, AND THEIR RESPECTIVE OFFICERS, AGENTS, SERVANTS, AND EMPLOYEES FROM AND AGAINST ANY AND ALL CLAIMS, LOSSES, DAMAGES, CAUSES OF ACTION, SUITS, AND LIABILITY OF EVERY KIND, INCLUDING ALL EXPENSES OF LITIGATION, COURT COSTS, AND ATTORNEYS FEES, FOR INJURY TO AND/OR DEATH OF ANY PERSON AND/OR FOR DAMAGE TO ANY PROPERTY (INCLUDING WITHOUT LIMITATION ENVIRONMENTAL DAMAGE OR POLLUTION) DIRECTLY OR INDIRECTLY ARISING OUT OF OR IN CONNECTION WITH GRANTEE'S USE OR OCCUPANCY OF THE PREMISES OR OPERATIONS

HEREUNDER, IF SUCH INJURIES, DEATH, OR DAMAGE ARE CAUSED IN WHOLE OR IN PART BY THE NEGLIGENCE, OTHER FAULT, AND/OR STRICT LIABILITY OF GRANTEE, GRANTEE'S SUCCESSORS, ASSIGNS, CONTRACTORS, OR SUB-CONTRACTORS OR THEIR OFFICERS, AGENTS, SERVANTS, OR EMPLOYEES. THIS INDEMNITY AGREEMENT SHALL PROTECT GRANTOR, GRANTOR'S TENANTS, HEIRS, SUCCESSORS AND ASSIGNS, THE HOLDER OF THE FENNESSEY RANCH CONSERVATION EASEMENT DESCRIBED IN NUMBERED PARAGRAPH 14 AND THEIR OFFICERS, AGENTS, SERVANTS, AND EMPLOYEES. PROVIDED, HOWEVER, THAT THE ABOVE INDEMNITY AGREEMENT SHALL NOT PROTECT GRANTOR, GRANTOR'S TENANTS, HEIRS, SUCCESSORS OR ASSIGNS, THE HOLDER OF THE FENNESSEY RANCH CONSERVATION EASEMENT DESCRIBED IN NUMBERED PARAGRAPH 14, OR THEIR RESPECTIVE OFFICERS, AGENTS, SERVANTS, OR EMPLOYEES AGAINST THE CONSEQUENCES TO THE EXTENT OF THEIR OWN GROSS NEGLIGENCE OR INTENTIONAL INJURY. GRANTEE HAS INSPECTED THE PREMISES AND COVENANTS NOT TO SUE GRANTOR, GRANTOR'S TENANTS, HEIRS, SUCCESSORS OR ASSIGNS, THE HOLDER OF THE FENNESSEY RANCH CONSERVATION EASEMENT DESCRIBED IN NUMBERED PARAGRAPH 14, OR THEIR RESPECTIVE OFFICERS, AGENTS, SERVANTS, OR EMPLOYEES BECAUSE OF ANY PRESENTLY EXISTING CONDITION IN, UPON, OR AROUND THE PREMISES. GRANTEE, ITS SUCCESSORS AND ASSIGNS, AGREES TO OBSERVE AND CONFORM TO ALL LAWS, RULES AND REGULATIONS, STATE AND FEDERAL, APPLICABLE TO THE CONSTRUCTION, USE, OPERATION AND MAINTENANCE OF PIPELINES USED TO TRANSPORT OIL, GAS OR OTHER LIQUEFIED HYDROCARBONS. GRANTEE

AGREES TO SAVE AND HOLD GRANTOR AND THE HOLDER OF THE FENNESSEY RANCH CONSERVATION EASEMENT DESCRIBED IN NUMBERED PARAGRAPH 14 HARMLESS FROM ANY CLAIMS, DEMANDS, ACTIONS, JUDGMENTS, DAMAGES, REGULATORY RULINGS AND ORDERS, SUITS, PROCEEDINGS, FINES, CHARGES, REMEDIAL REQUIREMENTS AND ACTIONS, AND ALL COSTS AND EXPENSES RELATING THERETO (INCLUDING COSTS OF DEFENSE AND ATTORNEYS FEES) WHICH GRANTOR MAY INCUR OR MAY BE MADE A PARTY TO WHICH RESULTS IN ANY DAMAGE OR ADVERSE EFFECTS UPON THE ENVIRONMENT ARISING OUT OF OR AS A CONSEQUENCE OF THE VIOLATION OR THREATENED VIOLATION OF APPLICABLE FEDERAL OR STATE ENVIRONMENTAL LAWS AND REGULATIONS BY GRANTEE, WHETHER SUCH VIOLATIONS OR THREATENED VIOLATIONS ARE CAUSED BY ACTIONS OF THE GRANTEE, OR OMISSIONS OF GRANTEE, OR BY GRANTEE'S AGENTS, EMPLOYEES, CONTRACTORS OR SUB-CONTRACTORS OR ANY OTHERS ACTING FOR OR IN BEHALF OF GRANTEE.

VENUE

(10) The venue of all suits for the enforcement of this contract and for the enforcement of all claims for damages accruing to GRANTOR under the terms and provisions hereof shall be in the District Court of Refugio County, Texas; and GRANTOR may bring and maintain all suits in such County and GRANTEE agrees not to seek a change of venue to any other County in this State, and agrees not to seek a removal of any suit brought by the GRANTOR to any United States Court.

RESERVATION OF GRANTOR'S RIGHTS

(11) There is hereby reserved unto GRANTOR, GRANTOR'S heirs and assigns, the right to fully use and enjoy said granted premises, provided that such use and enjoyment by Grantor, or Grantor's heirs and assigns, shall not interfere with the use of said right-of-way for the purposes granted to the said Grantee in this Easement Agreement. The rights and easement herein granted are not exclusive, and subject to the Fennessey Ranch Conservation Easement referenced below, the GRANTOR shall have the right to grant other easements from time to time for roads, telephone and telegraph lines, electric transmission lines, and pipelines for the transportation of oil, gas, petroleum products and other substances which may be transported through pipelines across but not along the easement herein granted, so long as any such easement that may be hereinafter granted by the GRANTOR shall not interfere with the GRANTEE'S enjoyment of the easement hereby conveyed. GRANTOR reserves the right to build fences and roads across the right-of-way. If GRANTOR, GRANTOR'S heirs, or its assigns should build a road or roads across said pipeline, and such road or roads are damaged by GRANTEE'S operations, GRANTEE agrees to either restore said road or roads to the condition thereof prior to said damage, or pay for the damage. Grantor may not use any part of the Permanent Easement Property if such use may damage, destroy, injure, and/or interfere with the Grantee's use of the Permanent Easement Property for the purposes for which the permanent easement is being sought by Grantee. Grantor is not permitted to conduct any of the following activities on the Permanent Easement Property without the written permission of Grantee: (1) construct any temporary or permanent building or site improvements, other than streets and roads; (2) drill or operate any well; (3) remove soil or change the grade or slope; (4) impound surface water; or (5) plant trees or landscaping except in the environmentally sensitive areas designated in Exhibit C

where the surface is not to be disturbed by GRANTEE. Grantor further agrees that no above or below ground obstruction that may interfere with the purposes for which this Easement is being acquired may be placed, erected, installed or permitted upon the Permanent Easement Property without the written permission of Grantee.

LITTER AND CLEAN UP OF PIPELINE RIGHT-OF-WAY

(12) (a) Any litter and trash of any kind, including cans, bottles and cartons, which may be brought onto GRANTOR'S premises at any time by persons constructing, maintaining or inspecting said pipeline, shall be forthwith removed from said premises by GRANTEE at its own expense.

(b) GRANTEE agrees to leave the right-of-way free of all trees, stumps, brush and debris, except for the stacked vegetation. All brush and other material which is stacked on the right-of-way shall be free of dirt so as to be capable of being burned completely with no mounds of dirt or debris left on or adjacent to the cleared right-of-way. Stacks of brush and/or debris may not be stacked or pushed off of the right-of-way, and shall not be located so close to the exterior boundaries of the right-of-way so that burning might damage trees located off the right-of-way. Such stacks may be burned by GRANTEE at an appropriate time designated by the Grantor and any mounds leveled, removed from the premises or, chipped and spread.

INSPECTIONS

(13) It is agreed that GRANTEE will cause periodic inspections to be made of said pipeline and the easement hereby granted, and will promptly correct any defect which may from time to time appear. The GRANTEE agrees to report immediately to the GRANTOR, upon determining the same, any leaks which have occurred in said pipeline located on GRANTOR'S land and any damages which may have been caused to the surface of the GRANTOR'S land

occasioned thereby. The GRANTEE agrees to pay the GRANTOR for any such damages within a reasonable time after such damages occur. The term "reasonable time" shall be the same period of time stated in Paragraph (6)(a) above.

RIGHTS OF OTHERS

(14) This grant is made subject to the rights of any tenant or tenants now in possession of said land, the rights of any existing oil, gas and mineral leases covering all or any part of the above described land and the rights of any owner of existing rights-of-way and easements across said land. This grant is also expressly made subject and subordinate to the Fennessey Ranch Conservation Easement dated September 20, 2006, recorded in Volume 196, Page 749 of the Official Public Records of Refugio County, Texas.

INGRESS AND EGRESS

(15) GRANTEE shall confine its travel in and on the Easement Property within the boundaries of the Easement Property during the laying, construction, operation, maintenance, repair and removal of said pipeline, and shall not have the right of ingress and egress on, over, through or across other lands of the GRANTOR outside the boundaries of the Easement Property. The GRANTEE may use existing roads designated by GRANTOR, but the use of such roads shall not be considered as granting an easement or right-of-way to the GRANTEE, nor shall such use by the GRANTEE ripen into an easement by prescription. All roads permitted to be used by GRANTEE shall be maintained and kept in good repair by GRANTEE during the period of such use.

DOUBLE-DITCHING AND BORING

(16) The excavations for this pipeline shall be double-ditched as "double-ditched" is commonly used and understood in the pipeline industry, so as to segregate the top soil from the subsoil, and in back-filling the trenches dug to lay the pipeline, the bottom soil shall first be replaced in the bottom of the ditch, and the top soil shall be replaced on the top of the ditch. Provided that Grantee may use ditching only in the portions of the Permanent Easement Property identified on Exhibit A, as segment three (3) through and including segment sixteen (16); In all other areas, including beneath canals, creeks, rivers, wetlands, sloughs or other waterways on and immediately adjacent to Grantor's property, Grantee must install pipeline into holes bored underground so as to minimize disturbance to the environmentally sensitive portions of GRANTOR'S property.

FENCES AND GATES

(17) Should GRANTEE be required to cut or remove any fences, either property boundary fences or interior cross-fences, in order to obtain entrance to the subject easement, or to construct same, the GRANTEE shall, prior to cutting any such fence, brace the same on both sides of the proposed cut with three pressure treated creosote posts ten feet (10') in length, with not less than eight inch (8") tops, buried five feet (5') in the ground, and braces to prevent slackening of wires so that such fence shall remain in good condition to turn livestock; provided, however, if GRANTOR'S fence has pipe posts instead of wood, then GRANTEE shall use the same type and size pipe as corner posts and line posts in the existing fence. GRANTEE shall keep such opening closed or guarded so as to prevent livestock escaping from GRANTOR'S property, or from one pasture to another on GRANTOR'S property. Upon completion of initial construction operations, each wire gap will be removed and a permanent sturdy oil-field type

gate, sixteen feet (16') in length, installed, which gate shall, to the extent reasonably practicable, be constructed out of similar or better grade materials than already used for existing gates on the property. Each entry and exit gate shall be securely closed and locked, except when GRANTEE or its authorized personnel are actually passing through same.

ASSIGNMENT

(18) The rights of either party hereunder may be assigned, in whole or in part, subject to the provisions of this agreement. In the event Grantee (including assignees or subassignees) assigns this easement, or any interest therein, Grantee will within sixty (60) days of such assignment furnish Grantor with a true and correct copy thereof (with the recording data reflected thereon, in the event said assignment has been recorded). The terms "assign" and "assignment" as used in this Section includes any transfer of a legal or equitable interest in the easement, whether by sale, or any other type of assignment or agreement to assign. Assignment of this easement, in whole or in part, shall not relieve nor discharge Grantee, its assigns or subassignees of any obligations hereunder, theretofore accrued. By acceptance of this easement or any interest therein, Grantee and any assignee or subassignee agree to be bound by all of the terms hereof.

BINDING UPON HEIRS, SUCCESSORS AND ASSIGNS

(19) Acceptance of this contract and payment by the GRANTEE of the consideration above expressed shall be conclusive of the agreement on the part of the GRANTEE to all of the terms and conditions hereof, whereupon this contract shall extend to and be binding upon the parties hereto and their respective heirs, successors, assigns and other legal representatives.

MOWING

(20) GRANTEE shall keep its easement mowed wherever the land is being used for pasturing livestock; provided, however, that there will be no mowing during regulatory deer seasons.

GRANTEE'S ACCEPTANCE

(21) GRANTEE's agreement to and acceptance of the duties and obligations imposed on GRANTEE pursuant to this instrument shall be evidenced by GRANTEE's acceptance and execution of this instrument and recording of this instrument in Refugio County, Texas, where this right-of-way and easement is situated.

GOVERNMENT REGULATIONS

(22) GRANTEE shall conduct its operations within the Easement Property in a responsible and prudent manner consistent with all applicable safety standards and in full compliance with the laws, rules and regulations of the United States and the State of Texas and all state and federal agencies.

ENVIRONMENTAL COMPLIANCE

(23) At all times the Easement Property shall be used, operated and conducted in compliance with all applicable laws, statutes, rules and regulations of any governmental authority having jurisdiction including, without limitation, all environmental laws, statutes, rules and regulations of any federal, state or local authority at any time applicable to the Easement Property. Specifically, and without limiting the foregoing, GRANTEE agrees that (i) no toxic or hazardous substances shall be generated, treated, stored, disposed of or otherwise deposited or released in or on the Easement Property by GRANTEE, its agents, servants or employees, (ii) GRANTEE will not engage in and will not permit any of its agents, servants or employees to

CONSENTED TO:

FENNESSEY RANCH CONSERVATION EASEMENT HOLDER

This consent is for the specific easement described in this document and in no way constitutes or implies any consent to any further grant of easement or any development of the land subject to the Fennessey Ranch Conservation Easement.

The Board of Regents of The University of Texas System

By: _____
Florence P. Mayne
Executive Director of Real Estate
The University of Texas System

Approved as to Content
The University of Texas at Austin

By: _____
Amy Wanamaker
Campus Director of Real Estate

THE STATE OF TEXAS §

COUNTY OF _____ §

This instrument was acknowledged before me on this the _____ day of _____, 2012, by **Brien O'Connor Dunn**.

Notary Public/State of Texas

THE STATE OF TEXAS §

COUNTY OF _____ §

This instrument was acknowledged before me on this the _____ day of _____, 2012, by _____ as _____ of **Texana Gas Utility, LP.**

Notary Public/State of Texas

THE STATE OF TEXAS §

COUNTY OF TRAVIS §

This instrument was acknowledged before me on this the _____ day of November, 2012, by Florence P. Mayne, Executive Director of Real Estate, The University of Texas System, as the representative of The Board of Regents of The University of Texas System, as holder of the Fennessey Ranch Conservation Easement.

Notary Public/State of Texas

DMC/cdh: 5/8/12; 5/29/12
Dunn & Texana PLROW 12035 - cdh

engage in any activity with respect to the Easement Property which would cause (a) the Easement Property or the adjoining property of Grantor to become a hazardous waste treatment storage or disposal facility within the meaning of the Resource Conservation and Recovery Act of 1976 ("RCRA") as now or hereafter amended, or similar state law or local ordinance or other environmental law, (b) a release or threatened release of hazardous substance, from or to the Easement Property or the adjoining property of Grantor within the meaning of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 ("CERCLA") as now or hereinafter amended or any similar state law or local ordinance or any other environmental law, or (c) the discharge of pollutants or effluent into any water source or system, or the discharge into the air of any emissions which would require a permit under the Federal Water Pollution Control Act or the Clear Air act or any similar state or local ordinance or other environmental law; (iii) GRANTEE shall not permit any substance or conditions in or on the Easement Property or the adjoining property of Grantor which might support a claim or cause of action under RCRA, CERCLA, or any other federal, state or local environmental statues, regulations, ordinances or other environmental regulatory requirement; and (iv) no underground storage tanks will be located on the Easement Property. As used in the preceding provision the terms "hazardous substance" and "release" shall have the meanings specified in CERCLA, and the term "solid waste" and "disposal" (or "disposed") shall have the meanings specified in RCRA; provided in the event either CERCLA or RCRA is amended so as to broaden the meaning of any terms defined thereby, such amendment shall apply to Grantor; covenants contained herein and provided further, to the extent that the law of the State of Texas establish a meaning for such terms which is broader than that specified in either CERCLA or RCRA, the broader meaning or definition shall apply.

This grant and conveyance shall be binding upon and inure to the benefit of the parties hereto, and their respective heirs, assigns and other legal representatives.

This instrument may be executed in counterparts, and each counterpart shall be considered an original.

TO HAVE AND TO HOLD the above-described premises, together with all and singular the rights and appurtenances thereto in anywise belonging, unto the said GRANTEE, GRANTEE'S heirs and assigns, forever. And GRANTOR does hereby bind GRANTOR, GRANTOR'S heirs, executors and administrators, to WARRANT and FOREVER DEFEND, all and singular, the said premises unto the said GRANTEE, GRANTEE'S heirs and assigns, against every person whomsoever lawfully claiming or to claim the same, or any part thereof, by, through or under GRANTOR, but not otherwise.

EXECUTED on this the _____ day of _____, 2012 (the "Effective Date").

GRANTOR:

BRIEN O'CONNOR DUNN

GRANTEE:

TEXANA GAS UTILITY LP

By: _____

APPENDIX I

NERRS FEDERAL REGULATIONS

SUBCHAPTER B—OCEAN AND COASTAL RESOURCE MANAGEMENT

PART 921—NATIONAL ESTUARINE RESEARCH RESERVE SYSTEM REGULATIONS

Subpart A—General

Sec.

- 921.1 Mission, goals and general provisions.
- 921.2 Definitions.
- 921.3 National Estuarine Research Reserve System Biogeographic Classification Scheme and Estuarine Typologies.
- 921.4 Relationship to other provisions of the Coastal Zone Management Act and the Marine Protection, Research and Sanctuaries Act.

Subpart B—Site Selection, Post Site Selection and Management Plan Development

- 921.10 General.
- 921.11 Site selection and feasibility.
- 921.12 Post site selection.
- 921.13 Management plan and environmental impact statement development.

Subpart C—Acquisition, Development and Preparation of the Final Management Plan

- 921.20 General.
- 921.21 Initial acquisition and development awards.

Subpart D—Reserve Designation and Subsequent Operation

- 921.30 Designation of National Estuarine Research Reserves.
- 921.31 Supplemental acquisition and development awards.
- 921.32 Operation and management: Implementation of the management plan.
- 921.33 Boundary changes, amendments to the management plan, and addition of multiple-site components.

Subpart E—Ongoing Oversight, Performance Evaluation and Withdrawal of Designation

- 921.40 Ongoing oversight and evaluations of designated National Estuarine Research Reserves.
- 921.41 Withdrawal of designation.

Subpart F—Special Research Projects

- 921.50 General.
- 921.51 Estuarine research guidelines.

- 921.52 Promotion and coordination of estuarine research.

Subpart G—Special Monitoring Projects

- 921.60 General.

Subpart H—Special Interpretation and Education Projects

- 921.70 General.

Subpart I—General Financial Assistance Provisions

- 921.80 Application information.
- 921.81 Allowable costs.
- 921.82 Amendments to financial assistance awards.

APPENDIX I TO PART 921—BIOGEOGRAPHIC CLASSIFICATION SCHEME

APPENDIX II TO PART 921—TYPOLOGY OF NATIONAL ESTUARINE RESEARCH RESERVES

AUTHORITY: Section 315 of the Coastal Zone Management Act, as amended (16 U.S.C. 1461).

SOURCE: 58 FR 38215, July 15, 1993, unless otherwise noted.

Subpart A—General

§ 921.1 Mission, goals and general provisions.

(a) The mission of the National Estuarine Research Reserve Program is the establishment and management, through Federal-state cooperation, of a national system (National Estuarine Research Reserve System or System) of estuarine research reserves (National Estuarine Research Reserves or Reserves) representative of the various regions and estuarine types in the United States. National Estuarine Research Reserves are established to provide opportunities for long-term research, education, and interpretation.

(b) The goals of the Program are to:

(1) Ensure a stable environment for research through long-term protection of National Estuarine Research Reserve resources;

(2) Address coastal management issues identified as significant through coordinated estuarine research within the System;

(3) Enhance public awareness and understanding of estuarine areas and provide suitable opportunities for public education and interpretation;

(4) Promote Federal, state, public and private use of one or more Reserves within the System when such entities conduct estuarine research; and

(5) Conduct and coordinate estuarine research within the System, gathering and making available information necessary for improved understanding and management of estuarine areas.

(c) National Estuarine Research Reserves shall be open to the public to the extent permitted under state and Federal law. Multiple uses are allowed to the degree compatible with each Reserve's overall purpose as provided in the management plan (see §921.13) and consistent with paragraphs (a) and (b) of this section. Use levels are set by the state where the Reserve is located and analyzed in the management plan. The Reserve management plan shall describe the uses and establish priorities among these uses. The plan shall identify uses requiring a state permit, as well as areas where uses are encouraged or prohibited. Consistent with resource protection and research objectives, public access and use may be restricted to certain areas or components within a Reserve.

(d) Habitat manipulation for research purposes is allowed consistent with the following limitations. Manipulative research activities must be specified in the management plan, be consistent with the mission and goals of the program (see paragraphs (a) and (b) of this section) and the goals and objectives set forth in the Reserve's management plan, and be limited in nature and extent to the minimum manipulative activity necessary to accomplish the stated research objective. Manipulative research activities with a significant or long-term impact on Reserve resources require the prior approval of the state and the National Oceanic and Atmospheric Administration (NOAA). Manipulative research activities which can reasonably be expected to have a significant adverse impact on the estuarine resources and habitat of a Reserve, such that the activities themselves or their resulting short- and

long-term consequences compromise the representative character and integrity of a Reserve, are prohibited. Habitat manipulation for resource management purposes is prohibited except as specifically approved by NOAA as: (1) A restoration activity consistent with paragraph (e) of this section; or (2) an activity necessary for the protection of public health or the preservation of other sensitive resources which have been listed or are eligible for protection under relevant Federal or state authority (e.g., threatened/endangered species or significant historical or cultural resources) or if the manipulative activity is a long-term pre-existing use (i.e., has occurred prior to designation) occurring in a buffer area. If habitat manipulation is determined to be necessary for the protection of public health, the preservation of sensitive resources, or if the manipulation is a long-term pre-existing use in a buffer area, then these activities shall be specified in the Reserve management plan in accordance with §921.13(a)(10) and shall be limited to the reasonable alternative which has the least adverse and shortest term impact on the representative and ecological integrity of the Reserve.

(e) Under the Act an area may be designated as an estuarine Reserve only if the area is a representative estuarine ecosystem that is suitable for long-term research. Many estuarine areas have undergone some ecological change as a result of human activities (e.g., hydrological changes, intentional/unintentional species composition changes—introduced and exotic species). In those areas proposed or designated as National Estuarine Research Reserves, such changes may have diminished the representative character and integrity of the site. Although restoration of degraded areas is not a primary purpose of the System, such activities may be permitted to improve the representative character and integrity of a Reserve. Restoration activities must be carefully planned and approved by NOAA through the Reserve management plan. Historical research may be necessary to determine the "natural" representative state of an estuarine area (i.e., an estuarine ecosystem minimally affected by

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human activity or influence). Frequently, restoration of a degraded estuarine area will provide an excellent opportunity for management oriented research.

(f) NOAA may provide financial assistance to coastal states, not to exceed, per Reserve, 50 percent of all actual costs or \$5 million whichever amount is less, to assist in the acquisition of land and waters, or interests therein. NOAA may provide financial assistance to coastal states not to exceed 70 percent of all actual costs for the management and operation of, the development and construction of facilities, and the conduct of educational or interpretive activities concerning Reserves (see subpart I). NOAA may provide financial assistance to any coastal state or public or private person, not to exceed 70 percent of all actual costs, to support research and monitoring within a Reserve. Notwithstanding any financial assistance limits established by this Part, when financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, such assistance may be used to pay 100 percent of all actual costs of activities carried out with this assistance, as long as such funds are available. Predesignation, acquisition and development awards are intended primarily for acquisition of interests in land, facility construction and to develop and/or upgrade research, monitoring and education programs. Operation and management awards provide funds to assist in implementing, operating and managing the administrative, and basic research, monitoring and education programs, outlined in the Reserve management plan. Special research and monitoring awards provide funds to conduct estuarine research and monitoring projects with the System. Special educational and interpretive awards provide funds to conduct estuarine educational and

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interpretive projects within the System.

(g) Lands already in protected status managed by other Federal agencies, state or local governments, or private organizations may be included within National Estuarine Research Reserves only if the managing entity commits to long-term management consistent with paragraphs (d) and (e) of this section in the Reserve management plan. Federal lands already in protected status may not comprise a majority of the key land and water areas of a Reserve (see §921.11(c)(3)).

(h) To assist the states in carrying out the Program's goals in an effective manner, NOAA will coordinate a research and education information exchange throughout the National Estuarine Research Reserve System. As part of this role, NOAA will ensure that information and ideas from one Reserve are made available to others in the System. The network will enable Reserves to exchange information and research data with each other, with universities engaged in estuarine research, and with Federal, state, and local agencies. NOAA's objective is a system-wide program of research and monitoring capable of addressing the management issues that affect long-term productivity of our Nation's estuaries.

[58 FR 38215, July 15, 1993, as amended at 62 FR 12540, Mar. 17, 1997; 63 FR 26717, May 14, 1998]

§921.2 Definitions.

(a) *Act* means the Coastal Zone Management Act of 1972, as amended, 16 U.S.C. 1451 *et seq.*

(b) *Assistant Administrator* means the Assistant Administrator for Ocean Services and Coastal Zone Management or delegee.

(c) *Coastal state* means a state of the United States, in or bordering on, the Atlantic, Pacific, or Arctic Ocean, the Gulf of Mexico, Long Island Sound, or one or more of the Great Lakes. For the purposes of these regulations the term also includes Puerto Rico, the Virgin Islands, Guam, the Commonwealth of the Northern Mariana Islands, the Trust Territories of the Pacific Islands, and American Samoa (see 16 U.S.C. 1453(4)).

(d) *State agency* means an instrumentality of a coastal state to whom the coastal state has delegated the authority and responsibility for the creation and/or management/operation of a National Estuarine Research Reserve. Factors indicative of this authority may include the power to receive and expend funds on behalf of the Reserve, acquire and sell or convey real and personal property interests, adopt rules for the protection of the Reserve, enforce rules applicable to the Reserve, or develop and implement research and education programs for the reserve. For the purposes of these regulations, the terms “coastal state” and “State agency” shall be synonymous.

(e) *Estuary* means that part of a river or stream or other body of water having unimpaired connection with the open sea, where the sea water is measurably diluted with fresh water derived from land drainage. The term also includes estuary-type areas with measurable freshwater influence and having unimpaired connections with the open sea, and estuary-type areas of the Great Lakes and their connecting waters (see 16 U.S.C. 1453(7)).

(f) *National Estuarine Research Reserve* means an area that is a representative estuarine ecosystem suitable for long-term research, which may include all of the key land and water portion of an estuary, and adjacent transitional areas and uplands constituting to the extent feasible a natural unit, and which is set aside as a natural field laboratory to provide long-term opportunities for research, education, and interpretation on the ecological relationships within the area (see 16 U.S.C. 1453(8)) and meets the requirements of 16 U.S.C. 1461(b). This includes those areas designated as National Estuarine Sanctuaries or Reserves under section 315 of the Act prior to enactment of the Coastal Zone Act Reauthorization Amendments of 1990 and each area subsequently designated as a National Estuarine Research Reserve.

§921.3 National Estuarine Research Reserve System Biogeographic Classification Scheme and Estuarine Typologies.

(a) National Estuarine Research Reserves are chosen to reflect regional

differences and to include a variety of ecosystem types. A biogeographic classification scheme based on regional variations in the nation’s coastal zone has been developed. The biogeographic classification scheme is used to ensure that the National Estuarine Research Reserve System includes at least one site from each region. The estuarine typology system is utilized to ensure that sites in the System reflect the wide range of estuarine types within the United States.

(b) The biogeographic classification scheme, presented in appendix I, contains 29 regions. Figure 1 graphically depicts the biogeographic regions of the United States.

(c) The typology system is presented in appendix II.

§921.4 Relationship to other provisions of the Coastal Zone Management Act, and to the Marine Protection, Research and Sanctuaries Act.

(a) The National Estuarine Research Reserve System is intended to provide information to state agencies and other entities involved in addressing coastal management issues. Any coastal state, including those that do not have approved coastal management programs under section 306 of the Act, is eligible for an award under the National Estuarine Research Reserve Program (see §921.2(c)).

(b) For purposes of consistency review by states with a federally approved coastal management program, the designation of a National Estuarine Research Reserve is deemed to be a Federal activity, which, if directly affecting the state’s coastal zone, must be undertaken in a manner consistent to the maximum extent practicable with the approved state coastal management program as provided by section 1456(c)(1) of the Act, and implementing regulations at 15 CFR part 930, subpart C. In accordance with section 1456(c)(1) of the Act and the applicable regulations NOAA will be responsible for certifying that designation of the Reserve is consistent with the state’s approved coastal management program. The state must concur with or object to the certification. It is recommended that the lead state agency for Reserve designation consult, at the

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earliest practicable time, with the appropriate state officials concerning the consistency of a proposed National Estuarine Research Reserve.

(c) The National Estuarine Research Reserve Program will be administered in close coordination with the National Marine Sanctuary Program (Title III of the Marine Protection, Research and Sanctuaries Act, as amended, 16 U.S.C. 1431-1445), also administered by NOAA. Title III authorizes the Secretary of Commerce to designate discrete areas of the marine environment as National Marine Sanctuaries to protect or restore such areas for their conservation, recreational, ecological, historical, research, educational or esthetic values. National Marine Sanctuaries and Estuarine Research Reserves may not overlap, but may be adjacent.

Subpart B—Site Selection, Post Site Selection and Management Plan Development

§921.10 General.

(a) A coastal state may apply for Federal financial assistance for the purpose of site selection, preparation of documents specified in §921.13 (draft management plan (DMP) and environmental impact statement (EIS)), and the conduct of limited basic characterization studies. The total Federal share of this assistance may not exceed \$100,000. Federal financial assistance for preacquisition activities under §921.11 and §921.12 is subject to the total \$5 million for which each Reserve is eligible for land acquisition. Notwithstanding the above, when financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, such assistance may be used to pay 100 percent of all actual costs of activities carried out with this assistance, as long as such funds are available. In the case of a biogeographic region (see appendix I) shared by two or more coastal states, each state is eligible for Federal financial assistance to establish a separate National Estuarine Research Reserve within their respective portion of the shared biogeographic region. Each separate National Estuarine Research Reserve is eligible for the full complement of

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funding. Financial assistance application procedures are specified in subpart I.

(b) In developing a Reserve program, a state may choose to develop a multiple-site Reserve reflecting a diversity of habitats in a single biogeographic region. A multiple-site Reserve allows the state to develop complementary research and educational programs within the individual components of its multi-site Reserve. Multiple-site Reserves are treated as one Reserve in terms of financial assistance and development of an overall management framework and plan. Each individual site of a proposed multiple-site Reserve shall be evaluated both separately under §921.11(c) and collectively as part of the site selection process. A coastal state may propose to establish a multiple-site Reserve at the time of the initial site selection, or at any point in the development or operation of the Reserve. If the state decides to develop a multiple-site National Estuarine Research Reserve after the initial acquisition and development award is made for a single site, the proposal is subject to the requirements set forth in §921.33(b). However, a state may not propose to add one or more sites to an already designated Reserve if the operation and management of such Reserve has been found deficient and uncorrected or the research conducted is not consistent with the Estuarine Research Guidelines referenced in §921.51. In addition, Federal funds for the acquisition of a multiple-site Reserve remain limited to \$5,000,000 (see §921.20). The funding for operation of a multiple-site Reserve is limited to the maximum allowed for any one Reserve per year (see §921.32(c)) and preacquisition funds are limited to \$100,000 per Reserve. Notwithstanding the above, when financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, such assistance may be used to pay 100 percent of all actual costs of activities carried out with this assistance, as long as such funds are available.

[58 FR 38215, July 15, 1993, as amended at 63 FR 26717, May 14, 1998]

§ 921.11 Site selection and feasibility.

(a) A coastal state may use Federal funds to establish and implement a site selection process which is approved by NOAA.

(b) In addition to the requirements set forth in subpart I, a request for Federal funds for site selection must contain the following programmatic information:

(1) A description of the proposed site selection process and how it will be implemented in conformance with the biogeographic classification scheme and typology (§921.3);

(2) An identification of the site selection agency and the potential management agency; and

(3) A description of how public participation will be incorporated into the process (see §921.11(d)).

(c) As part of the site selection process, the state and NOAA shall evaluate and select the final site(s). NOAA has final authority in approving such sites. Site selection shall be guided by the following principles:

(1) The site's contribution to the biogeographical and typological balance of the National Estuarine Research Reserve System. NOAA will give priority consideration to proposals to establish Reserves in biogeographic regions or subregions or incorporating types that are not represented in the system. (see the biogeographic classification scheme and typology set forth in §921.3 and appendices I and II);

(2) The site's ecological characteristics, including its biological productivity, diversity of flora and fauna, and capacity to attract a broad range of research and educational interests. The proposed site must be a representative estuarine ecosystem and should, to the maximum extent possible, be an estuarine ecosystem minimally affected by human activity or influence (see §921.1(e)).

(3) Assurance that the site's boundaries encompass an adequate portion of the key land and water areas of the natural system to approximate an ecological unit and to ensure effective conservation. Boundary size will vary greatly depending on the nature of the ecosystem. Reserve boundaries must encompass the area within which adequate control has or will be established

by the managing entity over human activities occurring within the Reserve. Generally, Reserve boundaries will encompass two areas: Key land and water areas (or "core area") and a buffer zone. Key land and water areas and a buffer zone will likely require significantly different levels of control (see §921.13(a)(7)). The term "key land and water areas" refers to that core area within the Reserve that is so vital to the functioning of the estuarine ecosystem that it must be under a level of control sufficient to ensure the long-term viability of the Reserve for research on natural processes. Key land and water areas, which comprise the core area, are those ecological units of a natural estuarine system which preserve, for research purposes, a full range of significant physical, chemical and biological factors contributing to the diversity of fauna, flora and natural processes occurring within the estuary. The determination of which land and water areas are "key" to a particular Reserve must be based on specific scientific knowledge of the area. A basic principle to follow when deciding upon key land and water areas is that they should encompass resources representative of the total ecosystem, and which if compromised could endanger the research objectives of the Reserve. The term *buffer zone* refers to an area adjacent to or surrounding key land and water areas and essential to their integrity. Buffer zones protect the core area and provide additional protection for estuarine-dependent species, including those that are rare or endangered. When determined appropriate by the state and approved by NOAA, the buffer zone may also include an area necessary for facilities required for research and interpretation. Additionally, buffer zones should be established sufficient to accommodate a shift of the core area as a result of biological, ecological or geomorphological change which reasonably could be expected to occur. National Estuarine Research Reserves may include existing Federal or state lands already in a protected status where mutual benefit can be enhanced. However, NOAA will not approve a site

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for potential National Estuarine Research Reserve status that is dependent primarily upon the inclusion of currently protected Federal lands in order to meet the requirements for Reserve status (such as key land and water areas). Such lands generally will be included within a Reserve to serve as a buffer or for other ancillary purposes; and may be included, subject to NOAA approval, as a limited portion of the core area;

(4) The site's suitability for long-term estuarine research, including ecological factors and proximity to existing research facilities and educational institutions;

(5) The site's compatibility with existing and potential land and water uses in contiguous areas as well as approved coastal and estuarine management plans; and

(6) The site's importance to education and interpretive efforts, consistent with the need for continued protection of the natural system.

(d) Early in the site selection process the state must seek the views of affected landowners, local governments, other state and Federal agencies and other parties who are interested in the area(s) being considered for selection as a potential National Estuarine Research Reserve. After the local government(s) and affected landowner(s) have been contacted, at least one public meeting shall be held in the vicinity of the proposed site. Notice of such a meeting, including the time, place, and relevant subject matter, shall be announced by the state through the area's principal newspaper at least 15 days prior to the date of the meeting and by NOAA in the FEDERAL REGISTER.

(e) A state request for NOAA approval of a proposed site (or sites in the case of a multi-site Reserve) must contain a description of the proposed site(s) in relationship to each of the site selection principals (§921.11(c)) and the following information:

(1) An analysis of the proposed site(s) based on the biogeographical scheme/typology discussed in §921.3 and set forth in appendices I and II;

(2) A description of the proposed site(s) and its (their) major resources, including location, proposed bound-

aries, and adjacent land uses. Maps are required;

(3) A description of the public participation process used by the state to solicit the views of interested parties, a summary of comments, and, if interstate issues are involved, documentation that the Governor(s) of the other affected state(s) has been contacted. Copies of all correspondence, including contact letters to all affected landowners must be appended;

(4) A list of all sites considered and a brief statement of the reasons why a site was not preferred; and

(5) A nomination of the proposed site(s) for designation as a National Estuarine Research Reserve by the Governor of the coastal state in which the state is located.

(f) A state proposing to reactivate an inactive site, previously approved by NOAA for development as an Estuarine Sanctuary or Reserve, may apply for those funds remaining, if any, provided for site selection and feasibility (§921.11a)) to determine the feasibility of reactivation. This feasibility study must comply with the requirements set forth in §921.11 (c) through (e).

§921.12 Post site selection.

(a) At the time of the coastal state's request for NOAA approval of a proposed site, the state may submit a request for funds to develop the draft management plan and for preparation of the EIS. At this time, the state may also submit a request for the remainder of the predesignation funds to perform a limited basic characterization of the physical, chemical and biological characteristics of the site approved by NOAA necessary for providing EIS information to NOAA. The state's request for these post site selection funds must be accompanied by the information specified in subpart I and, for draft management plan development and EIS information collection, the following programmatic information:

(1) A draft management plan outline (see §921.13(a) below); and

(2) An outline of a draft memorandum of understanding (MOU) between the state and NOAA detailing the Federal-state role in Reserve management during the initial period of Federal funding and expressing the

state's long-term commitment to operate and manage the Reserve.

(b) The state is eligible to use the funds referenced in §921.12(a) after the proposed site is approved by NOAA under the terms of §921.11.

§ 921.13 Management plan and environmental impact statement development.

(a) After NOAA approves the state's proposed site and application for funds submitted pursuant to §921.12, the state may begin draft management plan development and the collection of information necessary for the preparation by NOAA of an EIS. The state shall develop a draft management plan, including an MOU. The plan shall set out in detail:

- (1) Reserve goals and objectives, management issues, and strategies or actions for meeting the goals and objectives;
- (2) An administrative plan including staff roles in administration, research, education/interpretation, and surveillance and enforcement;
- (3) A research plan, including a monitoring design;
- (4) An education/interpretive plan;
- (5) A plan for public access to the Reserve;
- (6) A construction plan, including a proposed construction schedule, general descriptions of proposed developments and general cost estimates. Information should be provided for proposed minor construction projects in sufficient detail to allow these projects to begin in the initial phase of acquisition and development. A categorical exclusion, environmental assessment, or EIS may be required prior to construction;
- (7)(i) An acquisition plan identifying the ecologically key land and water areas of the Reserve, ranking these areas according to their relative importance, and including a strategy for establishing adequate long-term state control over these areas sufficient to provide protection for Reserve resources to ensure a stable environment for research. This plan must include an identification of ownership within the proposed Reserve boundaries, including land already in the public domain; the method(s) of acquisition which the

state proposes to use—acquisition (including less-than-fee simple options) to establish adequate long-term state control; an estimate of the fair market value of any property interest—which is proposed for acquisition; a schedule estimating the time required to complete the process of establishing adequate state control of the proposed research reserve; and a discussion of any anticipated problems. In selecting a preferred method(s) for establishing adequate state control over areas within the proposed boundaries of the Reserve, the state shall perform the following steps for each parcel determined to be part of the key land and water areas (control over which is necessary to protect the integrity of the Reserve for research purposes), and for those parcels required for research and interpretive support facilities or buffer purposes:

- (A) Determine, with appropriate justification, the minimum level of control(s) required [e.g., management agreement, regulation, less-than-fee simple property interest (e.g., conservation easement), fee simple property acquisition, or a combination of these approaches]. This does not preclude the future necessity of increasing the level of state control;
 - (B) Identify the level of existing state control(s);
 - (C) Identify the level of additional state control(s), if any, necessary to meet the minimum requirements identified in paragraph (a)(7)(i)(A) of this section;
 - (D) Examine all reasonable alternatives for attaining the level of control identified in paragraph (a)(7)(i)(C) of this section, and perform a cost analysis of each; and
 - (E) Rank, in order of cost, the methods (including acquisition) identified in paragraph (a)(7)(i)(D) of this section.
- (ii) An assessment of the relative cost-effectiveness of control alternatives shall include a reasonable estimate of both short-term costs (e.g., acquisition of property interests, regulatory program development including associated enforcement costs, negotiation, adjudication, etc.) and long-term costs (e.g., monitoring, enforcement,

adjudication, management and coordination). In selecting a preferred method(s) for establishing adequate state control over each parcel examined under the process described above, the state shall give priority consideration to the least costly method(s) of attaining the minimum level of long-term control required. Generally, with the possible exception of buffer areas required for support facilities, the level of control(s) required for buffer areas will be considerably less than that required for key land and water areas. This acquisition plan, after receiving the approval of NOAA, shall serve as a guide for negotiations with landowners. A final boundary for the reserve shall be delineated as a part of the final management plan;

(8) A resource protection plan detailing applicable authorities, including allowable uses, uses requiring a permit and permit requirements, any restrictions on use of the research reserve, and a strategy for research reserve surveillance and enforcement of such use restrictions, including appropriate government enforcement agencies;

(9) If applicable, a restoration plan describing those portions of the site that may require habitat modification to restore natural conditions;

(10) If applicable, a resource manipulation plan, describing those portions of the Reserve buffer in which long-term pre-existing (prior to designation) manipulation for reasons not related to research or restoration is occurring. The plan shall explain in detail the nature of such activities, shall justify why such manipulation should be permitted to continue within the reserve buffer; and shall describe possible effects of this manipulation on key land and water areas and their resources;

(11) A proposed memorandum of understanding (MOU) between the state and NOAA regarding the Federal-state relationship during the establishment and development of the National Estuarine Research Reserve, and expressing a long-term commitment by the state to maintain and manage the Reserve in accordance with section 315 of the Act, 16 U.S.C. 1461, and applicable regulations. In conjunction with the MOU, and where possible under state law, the state will consider taking appropriate

administrative or legislative action to ensure the long-term protection and operation of the National Estuarine Research Reserve. If other MOUs are necessary (such as with a Federal agency, another state agency or private organization), drafts of such MOUs must be included in the plan. All necessary MOU's shall be signed prior to Reserve designation; and

(12) If the state has a federally approved coastal management program, a certification that the National Estuarine Research Reserve is consistent to the maximum extent practicable with that program. See §§921.4(b) and 921.30(b).

(b) Regarding the preparation of an EIS under the National Environmental Policy Act on a National Estuarine Research Reserve proposal, the state and NOAA shall collect all necessary information concerning the socioeconomic and environmental impacts associated with implementing the draft management plan and feasible alternatives to the plan. Based on this information, the state will draft and provide NOAA with a preliminary EIS.

(c) Early in the development of the draft management plan and the draft EIS, the state and NOAA shall hold a scoping meeting (pursuant to NEPA) in the area or areas most affected to solicit public and government comments on the significant issues related to the proposed action. NOAA will publish a notice of the meeting in the FEDERAL REGISTER at least 15 days prior to the meeting. The state shall be responsible for publishing a similar notice in the local media.

(d) NOAA will publish a FEDERAL REGISTER notice of intent to prepare a draft EIS. After the draft EIS is prepared and filed with the Environmental Protection Agency (EPA), a Notice of Availability of the draft EIS will appear in the FEDERAL REGISTER. Not less than 30 days after publication of the notice, NOAA will hold at least one public hearing in the area or areas most affected by the proposed national estuarine research reserve. The hearing will be held no sooner than 15 days after appropriate notice of the meeting has been given in the principal news media by the state and in the FEDERAL REGISTER by NOAA. After a 45-day

comment period, a final EIS will be prepared by the state and NOAA.

Subpart C—Acquisition, Development and Preparation of the Final Management Plan

§ 921.20 General.

The acquisition and development period is separated into two major phases. After NOAA approval of the site, draft management plan and draft MOU, and completion of the final EIS, a coastal state is eligible for an initial acquisition and development award(s). In this initial phase, the state should work to meet the criteria required for formal research reserve designation; *e.g.*, establishing adequate state control over the key land and water areas as specified in the draft management plan and preparing the final management plan. These requirements are specified in § 921.30. Minor construction in accordance with the draft management plan may also be conducted during this initial phase. The initial acquisition and development phase is expected to last no longer than three years. If necessary, a longer time period may be negotiated between the state and NOAA. After Reserve designation, a state is eligible for a supplemental acquisition and development award(s) in accordance with § 921.31. In this post-designation acquisition and development phase, funds may be used in accordance with the final management plan to construct research and educational facilities, complete any remaining land acquisition, for program development, and for restorative activities identified in the final management plan. In any case, the amount of Federal financial assistance provided to a coastal state with respect to the acquisition of lands and waters, or interests therein, for any one National Estuarine Research Reserve may not exceed an amount equal to 50 percent of the costs of the lands, waters, and interests therein or \$5,000,000, whichever amount is less, except when the financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, in which case the assistance may be used to pay 100 percent of all actual costs of activities carried out

with this assistance, as long as such funds are available.

[58 FR 38215, July 15, 1993, as amended at 62 FR 12540, Mar. 17, 1997; 63 FR 26717, May 14, 1998]

§ 921.21 Initial acquisition and development awards.

(a) Assistance is provided to aid the recipient prior to designation in:

(1) Acquiring a fee simple or less-than-fee simple real property interest in land and water areas to be included in the Reserve boundaries (see § 921.13(a)(7); § 921.30(d));

(2) Minor construction, as provided in paragraphs (b) and (c) of this section;

(3) Preparing the final management plan; and

(4) Initial management costs, *e.g.*, for implementing the NOAA approved draft management plan, hiring a Reserve manager and other staff as necessary and for other management-related activities. Application procedures are specified in subpart I.

(b) The expenditure of Federal and state funds on major construction activities is not allowed during the initial acquisition and development phase. The preparation of architectural and engineering plans, including specifications, for any proposed construction, or for proposed restorative activities, is permitted. In addition, minor construction activities, consistent with paragraph (c) of this section also are allowed. The NOAA-approved draft management plan must, however, include a construction plan and a public access plan before any award funds can be spent on construction activities.

(c) Only minor construction activities that aid in implementing portions of the management plan (such as boat ramps and nature trails) are permitted during the initial acquisition and development phase. No more than five (5) percent of the initial acquisition and development award may be expended on such activities. NOAA must make a specific determination, based on the final EIS, that the construction activity will not be detrimental to the environment.

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(d) Except as specifically provided in paragraphs (a) through (c) of this section, construction projects, to be funded in whole or in part under an acquisition and development award(s), may not be initiated until the Reserve receives formal designation (see §921.30). This requirement has been adopted to ensure that substantial progress in establishing adequate state control over key land and water areas has been made and that a final management plan is completed before major sums are spent on construction. Once substantial progress in establishing adequate state control/acquisition has been made, as defined by the state in the management plan, other activities guided by the final management plan may begin with NOAA's approval.

(e) For any real property acquired in whole or part with Federal funds for the Reserve, the state shall execute suitable title documents to include substantially the following provisions, or otherwise append the following provisions in a manner acceptable under applicable state law to the official land record(s):

(1) Title to the property conveyed by this deed shall vest in the [recipient of the award granted pursuant to section 315 of the Act, 16 U.S.C. 1461 or other NOAA approved state agency] subject to the condition that the designation of the [name of National Estuarine Reserve] is not withdrawn and the property remains part of the federally designated [name of National Estuarine Research Reserve]; and

(2) In the event that the property is no longer included as part of the Reserve, or if the designation of the Reserve of which it is part is withdrawn, then NOAA or its successor agency, after full and reasonable consultation with the State, may exercise the following rights regarding the disposition of the property:

(i) The recipient may retain title after paying the Federal Government an amount computed by applying the Federal percentage of participation in the cost of the original project to the current fair market value of the property;

(ii) If the recipient does not elect to retain title, the Federal Government

may either direct the recipient to sell the property and pay the Federal Government an amount computed by applying the Federal percentage of participation in the cost of the original project to the proceeds from the sale (after deducting actual and reasonable selling and repair or renovation expenses, if any, from the sale proceeds), or direct the recipient to transfer title to the Federal Government. If directed to transfer title to the Federal Government, the recipient shall be entitled to compensation computed by applying the recipient's percentage of participation in the cost of the original project to the current fair market value of the property; and

(iii) Fair market value of the property must be determined by an independent appraiser and certified by a responsible official of the state, as provided by Department of Commerce regulations at 15 CFR part 24, and Uniform Relocation Assistance and Real Property Acquisition for Federal and Federally assisted programs at 15 CFR part 11.

(f) Upon instruction by NOAA, provisions analogous to those of §921.21(e) shall be included in the documentation underlying less-than-fee-simple interests acquired in whole or part with Federal funds.

(g) Federal funds or non-Federal matching share funds shall not be spent to acquire a real property interest in which the state will own the land concurrently with another entity unless the property interest has been identified as a part of an acquisition strategy pursuant to §921.13(7) which has been approved by NOAA prior to the effective date of these regulations.

(h) Prior to submitting the final management plan to NOAA for review and approval, the state shall hold a public meeting to receive comment on the plan in the area affected by the estuarine research reserve. NOAA will publish a notice of the meeting in the FEDERAL REGISTER at least 15 days prior to the public meeting. The state shall be responsible for having a similar notice published in the local newspaper(s).

Subpart D—Reserve Designation and Subsequent Operation

§ 921.30 Designation of National Estuarine Research Reserves.

(a) The Under Secretary may designate an area proposed for designation by the Governor of the state in which it is located, as a National Estuarine Research Reserve if the Under Secretary finds:

(1) The area is a representative estuarine ecosystem that is suitable for long-term research and contributes to the biogeographical and typological balance of the System;

(2) Key land and water areas of the proposed Reserve, as identified in the management plan, are under adequate state control sufficient to provide long-term protection for reserve resources to ensure a stable environment for research;

(3) Designation of the area as a Reserve will serve to enhance public awareness and understanding of estuarine areas, and provide suitable opportunities for public education and interpretation;

(4) A final management plan has been approved by NOAA;

(5) An MOU has been signed between the state and NOAA ensuring a long-term commitment by the state to the effective operation and implementation of the area as a National Estuarine Research Reserve;

(6) All MOU's necessary for reserve management (*i.e.*, with relevant Federal, state, and local agencies and/or private organizations) have been signed; and

(7) The coastal state in which the area is located has complied with the requirements of subpart B.

(b) NOAA will determine whether the designation of a National Estuarine Research Reserve in a state with a federally approved coastal zone management program directly affects the coastal zone. If the designation is found to directly affect the coastal zone, NOAA will make a consistency determination pursuant to § 307(c)(1) of the Act, 16 U.S.C. 1456, and 15 CFR part 930, subpart C. See § 921.4(b). The results of this consistency determination will be published in the FEDERAL REGISTER

when the notice of designation is published. See § 921.30(c).

(c) NOAA will publish the notice of designation of a National Estuarine Research Reserve in the FEDERAL REGISTER. The state shall be responsible for having a similar notice published in the local media.

(d) The term *state control* in § 921.30(a)(3) does not necessarily require that key land and water areas be owned by the state in fee simple. Acquisition of less-than-fee simple interests *e.g.*, conservation easements) and utilization of existing state regulatory measures are encouraged where the state can demonstrate that these interests and measures assure adequate long-term state control consistent with the purposes of the research reserve (see also §§ 921.13(a)(7); 921.21(g)). Should the state later elect to purchase an interest in such lands using NOAA funds, adequate justification as to the need for such acquisition must be provided to NOAA.

§ 921.31 Supplemental acquisition and development awards.

After National Estuarine Research Reserve designation, and as specified in the approved management plan, a coastal state may request a supplemental acquisition and/or development award(s) for acquiring additional property interests identified in the management plan as necessary to strengthen protection of key land and water areas and to enhance long-term protection of the area for research and education, for facility and exhibit construction, for restorative activities identified in the approved management plan, for administrative purposes related to acquisition and/or facility construction and to develop and/or upgrade research, monitoring and education/interpretive programs. Federal financial assistance provided to a National Estuarine Research Reserve for supplemental development costs directly associated with facility construction (*i.e.*, major construction activities) may not exceed 70 percent of the total project cost, except when the financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, in which case the assistance may be used to pay 100

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percent of the costs. NOAA must make a specific determination that the construction activity will not be detrimental to the environment. Acquisition awards for the acquisition of lands or waters, or interests therein, for any one reserve may not exceed an amount equal to 50 percent of the costs of the lands, waters, and interests therein of \$5,000,000, whichever amount is less, except when the financial assistance is provided from amounts recovered as result of damage to natural resources located in the coastal zone, in which case the assistance may be used to pay 100 percent of all actual costs of activities carried out with this assistance, as long as such funds are available. In the case of a biogeographic region (see appendix I) shared by two or more states, each state is eligible independently for Federal financial assistance to establish a separate National Estuarine Research Reserve within their respective portion of the shared biogeographic region. Application procedures are specified in subpart I. Land acquisition must follow the procedures specified in §§ 921.13(a)(7), 921.21(e) and (f) and 921.81.

[58 FR 38215, July 15, 1993, as amended at 62 FR 12540, Mar. 17, 1997; 63 FR 26717, May 14, 1998]

§ 921.32 Operation and management: Implementation of the management plan.

(a) After the Reserve is formally designated, a coastal state is eligible to receive Federal funds to assist the state in the operation and management of the Reserve including the management of research, monitoring, education, and interpretive programs. The purpose of this Federally funded operation and management phase is to implement the approved final management plan and to take the necessary steps to ensure the continued effective operation of the Reserve.

(b) State operation and management of the Reserves shall be consistent with the mission, and shall further the goals of the National Estuarine Research Reserve program (see § 921.1).

(c) Federal funds are available for the operation and management of the Reserve. Federal funds provided pursuant to this section may not exceed 70 percent of the total cost of operating and

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managing the Reserve for any one year, except when the financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, in which case the assistance may be used to pay 100 percent of the costs. In the case of a biogeographic region (see Appendix I) shared by two or more states, each state is eligible for Federal financial assistance to establish a separate Reserve within their respective portion of the shared biogeographic region (see § 921.10).

(d) Operation and management funds are subject to the following limitations:

(1) Eligible coastal state agencies may apply for up to the maximum share available per Reserve for that fiscal year. Share amounts will be announced annually by letter from the Sanctuary and Reserves Division to all participating states. This letter will be provided as soon as practicable following approval of the Federal budget for that fiscal year.

(2) No more than ten percent of the total amount (state and Federal shares) of each operation and management award may be used for construction-type activities.

[58 FR 38215, July 15, 1993, as amended at 62 FR 12541, Mar. 17, 1997]

§ 921.33 Boundary changes, amendments to the management plan, and addition of multiple-site components.

(a) Changes in the boundary of a Reserve and major changes to the final management plan, including state laws or regulations promulgated specifically for the Reserve, may be made only after written approval by NOAA. NOAA may require public notice, including notice in the FEDERAL REGISTER and an opportunity for public comment before approving a boundary or management plan change. Changes in the boundary of a Reserve involving the acquisition of properties not listed in the management plan or final EIS require public notice and the opportunity for comment; in certain cases, a categorical exclusion, an environmental assessment and possibly an environmental impact statement may be required.

NOAA will place a notice in the FEDERAL REGISTER of any proposed changes in Reserve boundaries or proposed major changes to the final management plan. The state shall be responsible for publishing an equivalent notice in the local media. See also requirements of §§921.4(b) and 921.13(a)(11).

(b) As discussed in §921.10(b), a state may choose to develop a multiple-site National Estuarine Research Reserve after the initial acquisition and development award for a single site has been made. NOAA will publish notice of the proposed new site including an invitation for comments from the public in the FEDERAL REGISTER. The state shall be responsible for publishing an equivalent notice in the local newspaper(s). An EIS, if required, shall be prepared in accordance with section §921.13 and shall include an administrative framework for the multiple-site Reserve and a description of the complementary research and educational programs within the Reserve. If NOAA determines, based on the scope of the project and the issues associated with the additional site(s), that an environmental assessment is sufficient to establish a multiple-site Reserve, then the state shall develop a revised management plan which, concerning the additional component, incorporates each of the elements described in §921.13(a). The revised management plan shall address goals and objectives for all components of the multi-site Reserve and the additional component's relationship to the original site(s).

(c) The state shall revise the management plan for a Reserve at least every five years, or more often if necessary. Management plan revisions are subject to (a) above.

(d) NOAA will approve boundary changes, amendments to management plans, or the addition of multiple-site components, by notice in the FEDERAL REGISTER. If necessary NOAA will revise the designation document (findings) for the site.

Subpart E—Ongoing Oversight, Performance Evaluation and Withdrawal of Designation

§ 921.40 Ongoing oversight and evaluations of designated National Estuarine Research Reserves.

(a) The Sanctuaries and Reserve Division shall conduct, in accordance with section 312 of the Act and procedures set forth in 15 CFR part 928, ongoing oversight and evaluations of Reserves. Interim sanctions may be imposed in accordance with regulations promulgated under 15 CFR part 928.

(b) The Assistant Administrator may consider the following indicators of non-adherence in determining whether to invoke interim sanctions:

(1) Inadequate implementation of required staff roles in administration, research, education/interpretation, and surveillance and enforcement. Indicators of inadequate implementation could include: No Reserve Manager, or no staff or insufficient staff to carry out the required functions.

(2) Inadequate implementation of the required research plan, including the monitoring design. Indicators of inadequate implementation could include: Not carrying out research or monitoring that is required by the plan, or carrying out research or monitoring that is inconsistent with the plan.

(3) Inadequate implementation of the required education/interpretation plan. Indicators of inadequate implementation could include: Not carrying out education or interpretation that is required by the plan, or carrying out education/interpretation that is inconsistent with the plan.

(4) Inadequate implementation of public access to the Reserve. Indicators of inadequate implementation of public access could include: Not providing necessary access, giving full consideration to the need to keep some areas off limits to the public in order to protect fragile resources.

(5) Inadequate implementation of facility development plan. Indicators of inadequate implementation could include: Not taking action to propose and

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budget for necessary facilities, or not undertaking necessary construction in a timely manner when funds are available.

(6) Inadequate implementation of acquisition plan. Indicators of inadequate implementation could include: Not pursuing an aggressive acquisition program with all available funds for that purpose, not requesting promptly additional funds when necessary, and evidence that adequate long-term state control has not been established over some core or buffer areas, thus jeopardizing the ability to protect the Reserve site and resources from offsite impacts.

(7) Inadequate implementation of Reserve protection plan. Indicators of inadequate implementation could include: Evidence of non-compliance with Reserve restrictions, insufficient surveillance and enforcement to assure that restrictions on use of the Reserve are adhered to, or evidence that Reserve resources are being damaged or destroyed as a result of the above.

(8) Failure to carry out the terms of the signed Memorandum of Understanding (MOU) between the state and NOAA, which establishes a long-term state commitment to maintain and manage the Reserve in accordance with section 315 of the Act. Indicators of failure could include: State action to allow incompatible uses of state-controlled lands or waters in the Reserve, failure of the state to bear its fair share of costs associated with long-term operation and management of the Reserve, or failure to initiate timely updates of the MOU when necessary.

§921.41 **Withdrawal of designation.**

The Assistant Administrator may withdraw designation of an estuarine area as a National Estuarine Research Reserve pursuant to and in accordance with the procedures of section 312 and 315 of the Act and regulations promulgated thereunder.

Subpart F—Special Research Projects

§921.50 **General.**

(a) To stimulate high quality research within designated National Estuarine Research Reserves, NOAA may provide financial support for research

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projects which are consistent with the Estuarine Research Guidelines referenced in §921.51. Research awards may be awarded under this subpart to only those designated Reserves with approved final management plans. Although research may be conducted within the immediate watershed of the Reserve, the majority of research activities of any single research project funded under this subpart may be conducted within Reserve boundaries. Funds provided under this subpart are primarily used to support management-related research projects that will enhance scientific understanding of the Reserve ecosystem, provide information needed by Reserve management and coastal management decision-makers, and improve public awareness and understanding of estuarine ecosystems and estuarine management issues. Special research projects may be oriented to specific Reserves; however, research projects that would benefit more than one Reserve in the National Estuarine Research System are encouraged.

(b) Funds provided under this subpart are available on a competitive basis to any coastal state or qualified public or private person. A notice of available funds will be published in the FEDERAL REGISTER. Special research project funds are provided in addition to any other funds available to a coastal state under the Act. Federal funds provided under this subpart may not exceed 70 percent of the total cost of the project, consistent with §921.81(e)(4) (“allowable costs”), except when the financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, in which case the assistance may be used to pay 100 percent of the costs.

[58 FR 38215, July 15, 1993, as amended at 62 FR 12541, Mar. 17, 1997]

§921.51 **Estuarine research guidelines.**

(a) Research within the National Estuarine Research Reserve System shall be conducted in a manner consistent with Estuarine Research Guidelines developed by NOAA.

(b) A summary of the Estuarine Research Guidelines is published in the

FEDERAL REGISTER as a part of the notice of available funds discussed in § 921.50(c).

(c) The Estuarine Research Guidelines are reviewed annually by NOAA. This review will include an opportunity for comment by the estuarine research community.

§ 921.52 Promotion and coordination of estuarine research.

(a) NOAA will promote and coordinate the use of the National Estuarine Research Reserve System for research purposes.

(b) NOAA will, in conducting or supporting estuarine research other than that authorized under section 315 of the Act, give priority consideration to research that make use of the National Estuarine Research Reserve System.

(c) NOAA will consult with other Federal and state agencies to promote use of one or more research reserves within the National Estuarine Research Reserve System when such agencies conduct estuarine research.

Subpart G—Special Monitoring Projects

§ 921.60 General.

(a) To provide a systematic basis for developing a high quality estuarine resource and ecosystem information base for National Estuarine Research Reserves and, as a result, for the System, NOAA may provide financial support for basic monitoring programs as part of operations and management under § 921.32. Monitoring funds are used to support three major phases of a monitoring program:

(1) Studies necessary to collect data for a comprehensive site description/characterization;

(2) Development of a site profile; and

(3) Formulation and implementation of a monitoring program.

(b) Additional monitoring funds may be available on a competitive basis to the state agency responsible for Reserve management or a qualified public or private person or entity. However, if the applicant is other than the managing entity of a Reserve that applicant must submit as a part of the application a letter from the Reserve manager indicating formal support of

the application by the managing entity of the Reserve. Funds provided under this subpart for special monitoring projects are provided in addition to any other funds available to a coastal state under the Act. Federal funds provided under this subpart may not exceed 70 percent of the total cost of the project, consistent with § 921.81(e)(4) ("allowable costs"), except when the financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, in which case the assistance may be used to pay 100 percent of the costs.

(c) Monitoring projects funded under this subpart must focus on the resources within the boundaries of the Reserve and must be consistent with the applicable sections of the Estuarine Research Guidelines referenced in § 921.51. Portions of the project may occur within the immediate watershed of the Reserve beyond the site boundaries. However, the monitoring proposal must demonstrate why this is necessary for the success of the project.

[58 FR 38215, July 15, 1993, as amended at 62 FR 12541, Mar. 17, 1997]

Subpart H—Special Interpretation and Education Projects

§ 921.70 General.

(a) To stimulate the development of innovative or creative interpretive and educational projects and materials to enhance public awareness and understanding of estuarine areas, NOAA may fund special interpretive and educational projects in addition to those activities provided for in operations and management under § 921.32. Special interpretive and educational awards may be awarded under this subpart to only those designated Reserves with approved final management plans.

(b) Funds provided under this subpart may be available on a competitive basis to any state agency. However, if the applicant is other than the managing entity of a Reserve, that applicant must submit as a part of the application a letter from the Reserve manager indicating formal support of the application by the managing entity

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of the Reserve. These funds are provided in addition to any other funds available to a coastal state under the Act. Federal funds provided under this subpart may not exceed 70 percent of the total cost of the project, consistent with § 921.81(e)(4) (“allowable costs”), except when the financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, in which case the assistance may be used to pay 100 percent of the costs.

(c) Applicants for education/interpretive projects that NOAA determines benefit the entire National Estuarine Research Reserve System may receive Federal assistance of up to 100% of project costs.

[58 FR 38215, July 15, 1993, as amended at 62 FR 12541, Mar. 17, 1997]

Subpart I—General Financial Assistance Provisions

§ 921.80 Application information.

(a) Only a coastal state may apply for Federal financial assistance awards for preacquisition, acquisition and development, operation and management, and special education and interpretation projects under subpart H. Any coastal state or public or private person may apply for Federal financial assistance awards for special estuarine research or monitoring projects under subpart G. The announcement of opportunities to conduct research in the System appears on an annual basis in the FEDERAL REGISTER. If a state is participating in the national Coastal Zone Management Program, the applicant for an award under section 315 of the Act shall notify the state coastal management agency regarding the application.

(b) An original and two copies of the formal application must be submitted at least 120 working days prior to the proposed beginning of the project to the following address: Sanctuaries and Reserves Division Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration, 1825 Connecticut Avenue, NW., suite 714, Washington, DC 20235. Application for Federal Assistance Standard Form 424 (Non-construction Program) con-

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stitutes the formal application for site selection, post-site selection, operation and management, research, and education and interpretive awards. The Application for Federal Financial Assistance Standard Form 424 (Construction Program) constitutes the formal application for land acquisition and development awards. The application must be accompanied by the information required in subpart B (predesignation), subpart C and § 921.31 (acquisition and development), and § 921.32 (operation and management) as applicable. Applications for development awards for construction projects, or restorative activities involving construction, must include a preliminary engineering report, a detailed construction plan, a site plan, a budget and categorical exclusion check list or environmental assessment. All applications must contain back up data for budget estimates (Federal and non-Federal shares), and evidence that the application complies with the Executive Order 12372, “Intergovernmental Review of Federal Programs.” In addition, applications for acquisition and development awards must contain:

- (1) State Historic Preservation Office comments;
- (2) Written approval from NOAA of the draft management plan for initial acquisition and development award(s); and
- (3) A preliminary engineering report for construction activities.

§ 921.81 Allowable costs.

(a) Allowable costs will be determined in accordance with applicable OMB Circulars and guidance for Federal financial assistance, the financial assistant agreement, these regulations, and other Department of Commerce and NOAA directives. The term “costs” applies to both the Federal and non-Federal shares.

(b) Costs claimed as charges to the award must be reasonable, beneficial and necessary for the proper and efficient administration of the financial assistance award and must be incurred during the award period.

(c) Costs must not be allocable to or included as a cost of any other Federally-financed program in either the current or a prior award period.

(d) General guidelines for the non-Federal share are contained in Department of Commerce Regulations at 15 CFR part 24 and OMB Circular A-110. Copies of Circular A-110 can be obtained from the Sanctuaries and Reserves Division; 1825 Connecticut Avenue, NW., suite 714; Washington, DC 20235. The following may be used in satisfying the matching requirement:

(1) *Site selection and post site selection awards.* Cash and in-kind contributions (value of goods and services directly benefiting and specifically identifiable to this part of the project) are allowable. Land may not be used as match.

(2) *Acquisition and development awards.* Cash and in-kind contributions are allowable. In general, the fair market value of lands to be included within the Reserve boundaries and acquired pursuant to the Act, with other than Federal funds, may be used as match. However, the fair market value of real property allowable as match is limited to the fair market value of a real property interest equivalent to, or required to attain, the level of control over such land(s) identified by the state and approved by the Federal Government as that necessary for the protection and management of the National Estuarine Research Reserve. Appraisals must be performed according to Federal appraisal standards as detailed in Department of Commerce regulations at 15 CFR part 24 and the Uniform Relocation Assistance and Real Property Acquisition for Federal land Federally assisted programs in 15 CFR part 11. The fair market value of privately donated land, at the time of donation, as established by an independent appraiser and certified by a responsible official of the state, pursuant to 15 CFR part 11, may also be used as match. Land, including submerged lands already in the state's possession, may be used as match to establish a National Estuarine Research Reserve. The value of match for these state lands will be calculated by determining the value of the benefits foregone by the state, in the use of the land, as a result of new restrictions that may be imposed by Reserve designation. The appraisal of the benefits foregone must be made by an independent appraiser in accordance with Federal appraisal standards pursuant

to 15 CFR part 24 and 15 CFR part 11. A state may initially use as match land valued at greater than the Federal share of the acquisition and development award. The value in excess of the amount required as match for the initial award may be used to match subsequent supplemental acquisition and development awards for the National Estuarine Research Reserve (see also §921.20). Costs related to land acquisition, such as appraisals, legal fees and surveys, may also be used as match.

(3) *Operation and management awards.* Generally, cash and in-kind contributions (directly benefiting and specifically identifiable to operations and management), except land, are allowable.

(4) *Research, monitoring, education and interpretive awards.* Cash and in-kind contributions (directly benefiting and specifically identifiable to the scope of work), except land, are allowable.

§921.82 Amendments to financial assistance awards.

Actions requiring an amendment to the financial assistance award, such as a request for additional Federal funds, revisions of the approved project budget or original scope of work, or extension of the performance period must be submitted to NOAA on Standard Form 424 and approved in writing.

APPENDIX I TO PART 921—
BIOGEOGRAPHIC CLASSIFICATION SCHEME

Acadian

1. Northern of Maine (Eastport to the Sheepscot River.)
2. Southern Gulf of Maine (Sheepscot River to Cape Cod.)

Virginian

3. Southern New England (Cape Cod to Sandy Hook.)
4. Middle Atlantic (Sandy Hook to Cape Hatteras.)
5. Chesapeake Bay.

Carolinian

6. North Carolinas (Cape Hatteras to Santee River.)
7. South Atlantic (Santee River to St. John's River.)
8. East Florida (St. John's River to Cape Canaveral.)

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West Indian

- 9. Caribbean (Cape Canaveral to Ft. Jefferson and south.)
- 10. West Florida (Ft. Jefferson to Cedar Key.)

Louisianian

- 11. Panhandle Coast (Cedar Key to Mobile Bay.)
- 12. Mississippi Delta (Mobile Bay to Galveston.)
- 13. Western Gulf (Galveston to Mexican border.)

Californian

- 14. Southern California (Mexican border to Point Conception.)
- 15. Central California (Point Conception to Cape Mendocino.)
- 16. San Francisco Bay.

Columbian

- 17. Middle Pacific (Cape Mendocino to the Columbia River.)
- 18. Washington Coast (Columbia River to Vancouver Island.)
- 19. Puget Sound.

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Great Lakes

- 20. Lake Superior (including St. Mary's River.)
- 21. Lakes Michigan and Huron (including Straits of Mackinac, St. Clair River, and Lake St. Clair.)
- 22. Lake Erie (including Detroit River and Niagara Falls.)
- 23. Lake Ontario (including St. Lawrence River.)

Fjord

- 24. Southern Alaska (Prince of Wales Island to Cook Inlet.)
- 25. Aleutian Island (Cook Inlet Bristol Bay.)

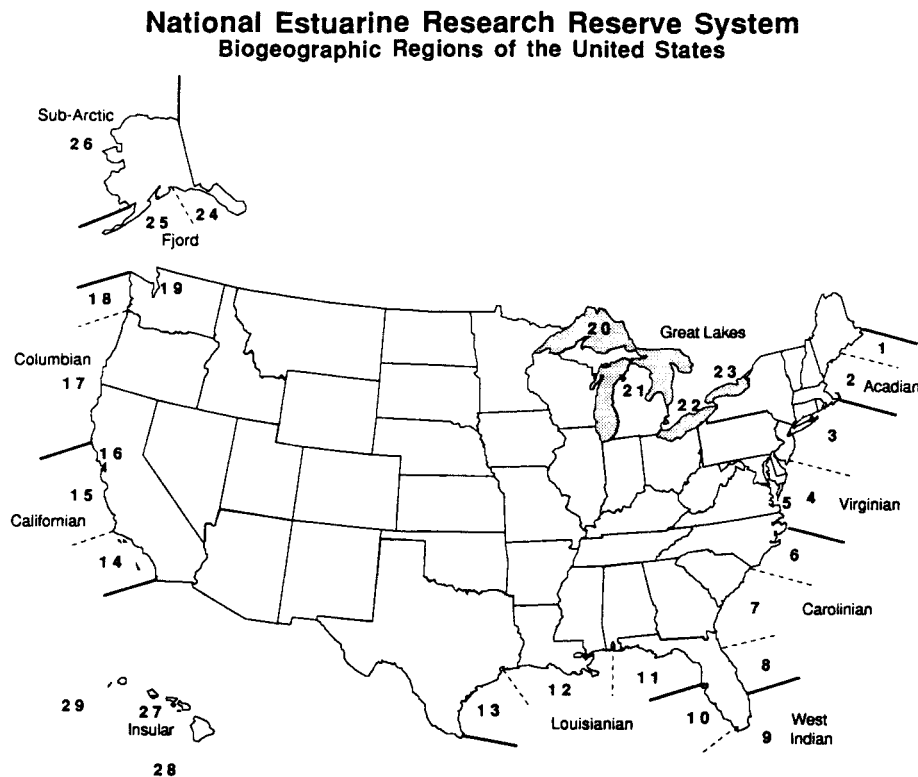
Sub-Arctic

- 26. Northern Alaska (Bristol Bay to Damarcation Point.)

Insular

- 27. Hawaiian Islands.
- 28. Western Pacific Island.
- 29. Eastern Pacific Island.

FIGURE 1



APPENDIX II TO PART 921— TYPOLOGY OF NATIONAL ESTUARINE RESEARCH RESERVES

This typology system reflects significant differences in estuarine characteristics that are not necessarily related to regional location. The purpose of this type of classification is to maximize ecosystem variety in the selection of national estuarine reserves. Priority will be given to important ecosystem types as yet unrepresented in the reserve system. It should be noted that any one site may represent several ecosystem types or physical characteristics.

Class I—Ecosystem Types

Group I—Shorelands

A. Maritime Forest-Woodland. That have developed under the influence of salt spray. It can be found on coastal uplands or recent features such as barrier islands and beaches,

and may be divided into the following biomes:

1. Northern coniferous forest biome: This is an area of predominantly evergreens such as the sitka spruce (*Picea*), grand fir (*Abies*), and white cedar (*Thuja*), with poor development of the shrub and herb layer, but high annual productivity and pronounced seasonal periodicity.

2. Moist temperate (Mesothermal) coniferous forest biome: Found along the west coast of North America from California to Alaska, this area is dominated by conifers, has relatively small seasonal range, high humidity with rainfall ranging from 30 to 150 inches, and a well-developed understory of vegetation with an abundance of mosses and other moisture-tolerant plants.

3. Temperate deciduous forest biome: This biome is characterized by abundant, evenly distributed rainfall, moderate temperatures which exhibit a distinct seasonal pattern,

well-developed soil biota and herb and shrub layers, and numerous plants which produce pulpy fruits and nuts. A distinct subdivision of this biome is the pine edible forest of the southeastern coastal plain, in which only a small portion of the area is occupied by climax vegetation, although it has large areas covered by edaphic climax pines.

4. Broad-leaved evergreen subtropical forest biome: The main characteristic of this biome is high moisture with less pronounced differences between winter and summer. Examples are the hammocks of Florida and the live oak forests of the Gulf and South Atlantic coasts. Floral dominants include pines, magnolias, bays, hollies, wild tamarine, strangler fig, gumbo limbo, and palms.

B. Coast shrublands. This is a transitional area between the coastal grasslands and woodlands and is characterized by woody species with multiple stems and a few centimeters to several meters above the ground developing under the influence of salt spray and occasional sand burial. This includes thickets, scrub, scrub savanna, heathlands, and coastal chaparral. There is a great variety of shrubland vegetation exhibiting regional specificity:

1. Northern areas: Characterized by *Hudsonia*, various erinaceous species, and thickets of *Myrica*, *Prunus*, and *Rosa*.

2. Southeast areas: Floral dominants include *Myrica*, *Baccharis*, and *Ilex*.

3. Western areas: *Adenostoma*, *arcotophylos*, and *eucalyptus* are the dominant floral species.

C. Coastal grasslands. This area, which possesses sand dunes and coastal flats, has low rainfall (10 to 30 inches per year) and large amounts of humus in the soil. Ecological succession is slow, resulting in the presence of a number of seral stages of community development. Dominant vegetation includes mid-grasses (5 to 8 feet tall), such as *Spartina*, and trees such as willow (*Salix* sp.), cherry (*Prunus* sp.), and cottonwood (*Pupulus deltoides*.) This area is divided into four regions with the following typical strand vegetation:

1. Arctic/Boreal: *Elymus*;
2. Northeast/West: *Ammophla*;
3. Southeast Gulf: *Uniola*; and
4. Mid-Atlantic/Gulf: *Spartina patens*.

D. Coastal tundra. This ecosystem, which is found along the Arctic and Boreal coasts of North America, is characterized by low temperatures, a short growing season, and some permafrost, producing a low, treeless mat community made up of mosses, lichens, heath, shrubs, grasses, sedges, rushes, and herbaceous and dwarf woody plants. Common species include arctic/alpine plants such as *Empetrum nigrum* and *Betula nana*, the lichens *Cetraria* and *Cladonia*, and herbaceous plants such as *Potentilla tridentata* and *Rubus chamaemorus*. Common species

on the coastal beach ridges of the high arctic desert include *Bryas intergrifolia* and *Saxifrage oppositifolia*. This area can be divided into two main subdivisions:

1. Low tundra: Characterized by a thick, spongy mat of living and undecayed vegetation, often with water and dotted with ponds when not frozen; and

2. High Tundra: A bare area except for a scanty growth of lichens and grasses, with underlying ice wedges forming raised polygonal areas.

E. Coastal cliffs. This ecosystem is an important nesting site for many sea and shore birds. It consists of communities of herbaceous, graminoid, or low woody plants (shrubs, heath, etc.) on the top or along rocky faces exposed to salt spray. There is a diversity of plant species including mosses, lichens, liverworts, and "higher" plant representatives.

GROUP II—TRANSITION AREAS

A. Coastal marshes. These are wetland areas dominated by grasses (*Poacea*), sedges (*Cyperaceae*), rushes (*Juncaceae*), cattails (*Typhaceae*), and other graminoid species and is subject to periodic flooding by either salt or freshwater. This ecosystem may be subdivided into: (a) Tidal, which is periodically flooded by either salt or brackish water; (b) nontidal (freshwater); or (c) tidal freshwater. These are essential habitats for many important estuarine species of fish and invertebrates as well as shorebirds and waterfowl and serve important roles in shore stabilization, flood control, water purification, and nutrient transport and storage.

B. Coastal swamps. These are wet lowland areas that support mosses and shrubs together with large trees such as cypress or gum.

C. Coastal mangroves. This ecosystem experiences regular flooding on either a daily, monthly, or seasonal basis, has low wave action, and is dominated by a variety of salt-tolerant trees, such as the red mangrove (*Rhizophora mangle*), black mangrove (*Avicennia Nitida*), and the white mangrove (*Laguncularia racemosa*.) It is also an important habitat for large populations of fish, invertebrates, and birds. This type of ecosystem can be found from central Florida to extreme south Texas to the islands of the Western Pacific.

D. Intertidal beaches. This ecosystem has a distinct biota of microscopic animals, bacteria, and unicellular algae along with macroscopic crustaceans, mollusks, and worms with a detritus-based nutrient cycle. This area also includes the driftline communities found at high tide levels on the beach. The dominant organisms in this ecosystem include crustaceans such as the mole crab (*Emerita*), amphipods (*Gammaridae*), ghost crabs (*Ocypode*), and bivalve mollusks such

as the coquina (*Donax*) and surf clams (*Spisula* and *Mactra*.)

E. Intertidal mud and sand flats. These areas are composed of unconsolidated, high organic content sediments that function as a short-term storage area for nutrients and organic carbons. Macrophytes are nearly absent in this ecosystem, although it may be heavily colonized by benthic diatoms, dinoflagellates, filamentous blue-green and green algae, and chaemosynthetic purple sulfur bacteria. This system may support a considerable population of gastropods, bivalves, and polychaetes, and may serve as a feeding area for a variety of fish and wading birds. In sand, the dominant fauna include the wedge shell *Donax*, the scallop *Pecten*, tellin shells *Tellina*, the heart urchin *Echinocardium*, the lug worm *Arenicola*, sand dollar *Dendraster*, and the sea pansy *Renilla*. In mud, faunal dominants adapted to low oxygen levels include the terebellid *Amphitrite*, the boring clam *Playdon*, the deep sea scallop *Placopecten*, the Quahog *Mercenaria*, the echiurid worm *Urechis*, the mud snail *Nassarius*, and the sea cucumber *Thyone*.

F. Intertidal algal beds. These are hard substrates along the marine edge that are dominated by macroscopic algae, usually thalloid, but also filamentous or unicellular in growth form. This also includes the rocky coast tidepools that fall within the intertidal zone. Dominant fauna of these areas are barnacles, mussels, periwinkles, anemones, and chitons. Three regions are apparent:

1. Northern latitude rocky shores: It is in this region that the community structure is best developed. The dominant algal species include *Chondrus* at the low tide level, *Fucus* and *Ascophyllum* at the mid-tidal level, and *Laminaria* and other kelp-like algae just beyond the intertidal, although they can be exposed at extremely low tides or found in very deep tidepools.

2. Southern latitudes: The communities in this region are reduced in comparison to those of the northern latitudes and possess algae consisting mostly of single-celled or filamentous green, blue-green, and red algae, and small thalloid brown algae.

3. Tropical and subtropical latitudes: The intertidal in this region is very reduced and contains numerous calcareous algae such as *Porolithon* and *Lithothamnion*, as well and green algae with calcareous particles such as *Halimeda*, and numerous other green, red, and brown algae.

GROUP III—SUBMERGED BOTTOMS

A. Subtidal hardbottoms. This system is characterized by a consolidated layer of solid rock or large pieces of rock (neither of biotic origin) and is found in association with geomorphological features such as submarine canyons and fjords and is usually covered with assemblages of sponges, sea fans, bivalves, hard corals, tunicates, and

other attached organisms. A significant feature of estuaries in many parts of the world is the oyster reef, a type of subtidal hardbottom. Composed of assemblages of organisms (usually bivalves), it is usually found near an estuary's mouth in a zone of moderate wave action, salt content, and turbidity. If light levels are sufficient, a covering of microscopic and attached macroscopic algae, such as kelp, may also be found.

B. Subtidal softbottoms. Major characteristics of this ecosystem are an unconsolidated layer of fine particles of silt, sand, clay, and gravel, high hydrogen sulfide levels, and anaerobic conditions often existing below the surface. Macrophytes are either sparse or absent, although a layer of benthic microalgae may be present if light levels are sufficient. The faunal community is dominated by a diverse population of deposit feeders including polychaetes, bivalves, and burrowing crustaceans.

C. Subtidal plants. This system is found in relatively shallow water (less than 8 to 10 meters) below mean low tide. It is an area of extremely high primary production that provides food and refuge for a diversity of faunal groups, especially juvenile and adult fish, and in some regions, manatees and sea turtles. Along the North Atlantic and Pacific coasts, the seagrass *Zostera marina* predominates. In the South Atlantic and Gulf coast areas, *Thalassia* and *Diplanthera* predominate. The grasses in both areas support a number of epiphytic organisms.

Class II—Physical Characteristics

GROUP I—GEOLOGIC

A. Basin type. Coastal water basins occur in a variety of shapes, sizes, depths, and appearances. The eight basic types discussed below will cover most of the cases:

1. Exposed coast: Solid rock formations or heavy sand deposits characterize exposed ocean shore fronts, which are subject to the full force of ocean storms. The sand beaches are very resilient, although the dunes lying just behind the beaches are fragile and easily damaged. The dunes serve as a sand storage area making them chief stabilizers of the ocean shoreline.

2. Sheltered coast: Sand or coral barriers, built up by natural forces, provide sheltered areas inside a bar or reef where the ecosystem takes on many characteristics of confined waters—abundant marine grasses, shellfish, and juvenile fish. Water movement is reduced, with the consequent effects of pollution being more severe in this area than in exposed coastal areas.

3. Bay: Bays are larger confined bodies of water that are open to the sea and receive strong tidal flow. When stratification is pronounced the flushing action is augmented by

river discharge. Bays vary in size and in type of shorefront.

4. Embayment: A confined coastal water body with narrow, restricted inlets and with a significant freshwater inflow can be classified as an embayment. These areas have more restricted inlets than bays, are usually smaller and shallower, have low tidal action, and are subject to sedimentation.

5. Tidal river: The lower reach of a coastal river is referred to as a tidal river. The coastal water segment extends from the sea or estuary into which the river discharges to a point as far upstream as there is significant salt content in the water, forming a salt front. A combination of tidal action and freshwater outflow makes tidal rivers well-flushed. The tidal river basin may be a simple channel or a complex of tributaries, small associated embayments, marshfronts, tidal flats, and a variety of others.

6. Lagoon: Lagoons are confined coastal bodies of water with restricted inlets to the sea and without significant freshwater inflow. Water circulation is limited, resulting in a poorly flushed, relatively stagnant body of water. Sedimentation is rapid with a great potential for basin shoaling. Shores are often gently sloping and marshy.

7. Perched coastal wetlands: Unique to Pacific islands, this wetland type found above sea level in volcanic crater remnants forms as a result of poor drainage characteristics of the crater rather than from sedimentation. Floral assemblages exhibit distinct zonation while the faunal constituents may include freshwater, brackish, and/or marine species. EXAMPLE: Aunu's Island, American Samoa.

8. Anchialine systems: These small coastal exposures of brackish water form in lava depressions or elevated fossil reefs have only a subsurface connection in the ocean, but show tidal fluctuations. Differing from true estuaries in having no surface continuity with streams or ocean, this system is characterized by a distinct biotic community dominated by benthic algae such as Rhizoclonium, the mineral encrusting Schizothrix, and the vascular plant *Ruppia maritima*. Characteristic fauna which exhibit a high degree of endemism, include the mollusks *Theosoxus neglectus* and *Tcariosus*. Although found throughout the world, the high islands of the Pacific are the only areas within the U.S. where this system can be found.

B. Basin structure. Estuary basins may result from the drowning of a river valley (coastal plains estuary), the drowning of a glacial valley (fjord), the occurrence of an offshore barrier (bar-bounded estuary), some tectonic process (tectonic estuary), or volcanic activity (volcanic estuary).

1. Coastal plains estuary: Where a drowned valley consists mainly of a single channel, the form of the basin is fairly regular form-

ing a simple coastal plains estuary. When a channel is flooded with numerous tributaries an irregular estuary results. Many estuaries of the eastern United States are of this type.

2. Fjord: Estuaries that form in elongated steep headlands that alternate with deep U-shaped valleys resulting from glacial scouring are called fjords. They generally possess rocky floors or very thin veneers of sediment, with deposition generally being restricted to the head where the main river enters. Compared to total fjord volume river discharge is small. But many fjords have restricted tidal ranges at their mouths due to sills, or upreaching sections of the bottom which limit free movement of water, often making river flow large with respect to the tidal prism. The deepest portions are in the upstream reaches, where maximum depths can range from 800m to 1200m while sill depths usually range from 40m to 150m.

3. Bar-bounded estuary: These result from the development of an offshore barrier such as a beach strand, a line of barrier islands, reef formations a line of moraine debris, or the subsiding remnants of a deltaic lobe. The basin is often partially exposed at low tide and is enclosed by a chain of offshore bars of barrier islands broken at intervals by inlets. These bars may be either deposited offshore or may be coastal dunes that have become isolated by recent sea level rises.

4. Tectonic estuary: These are coastal indentures that have formed through tectonic processes such as slippage along a fault line (San Francisco Bay), folding or movement of the earth's bedrock often with a large inflow of freshwater.

5. Volcanic estuary: These coastal bodies of open water, a result of volcanic processes are depressions or craters that have direct and/or subsurface connections with the ocean and may or may not have surface continuity with streams. These formations are unique to island areas of volcanic origin.

C. Inlet type. Inlets in various forms are an integral part of the estuarine environment as they regulate to a certain extent, the velocity and magnitude of tidal exchange, the degree of mixing, and volume of discharge to the sea.

1. Unrestricted: An estuary with a wide unrestricted inlet typically has slow currents, no significant turbulence, and receives the full effect of ocean waves and local disturbances which serve to modify the shoreline. These estuaries are partially mixed, as the open mouth permits the incursion of marine waters to considerable distances upstream, depending on the tidal amplitude and stream gradient.

2. Restricted: Restrictions of estuaries can exist in many forms: Bars, barrier islands, spits, sills, and more. Restricted inlets result in decreased circulation, more pronounced longitudinal and vertical salinity gradients, and more rapid sedimentation. However, if

the estuary mouth is restricted by depositional features or land closures, the incoming tide may be held back until it suddenly breaks forth into the basin as a tidal wave, or bore. Such currents exert profound effects on the nature of the substrate, turbidity, and biota of the estuary.

3. Permanent: Permanent inlets are usually opposite the mouths of major rivers and permit river water to flow into the sea.

4. Temporary (Intermittent): Temporary inlets are formed by storms and frequently shift position, depending on tidal flow, the depth of the sea, and sound waters, the frequency of storms, and the amount of littoral transport.

D. Bottom composition. The bottom composition of estuaries attests to the vigorous, rapid, and complex sedimentation processes characteristic of most coastal regions with low relief. Sediments are derived through the hydrologic processes of erosion, transport, and deposition carried on by the sea and the stream.

1. Sand: Near estuary mouths, where the predominating forces of the sea build spits or other depositional features, the shore and substrates of the estuary are sandy. The bottom sediments in this area are usually coarse, with a graduation toward finer particles in the head region and other zones of reduced flow, fine silty sands are deposited. Sand deposition occurs only in wider or deeper regions where velocity is reduced.

2. Mud: At the base level of a stream near its mouth, the bottom is typically composed of loose muds, silts, and organic detritus as a result of erosion and transport from the upper stream reaches and organic decomposition. Just inside the estuary entrance, the bottom contains considerable quantities of sand and mud, which support a rich fauna. Mud flats, commonly built up in estuarine basins, are composed of loose, coarse, and fine mud and sand, often dividing the original channel.

3. Rock: Rocks usually occur in areas where the stream runs rapidly over a steep gradient with its coarse materials being derived from the higher elevations where the stream slope is greater. The larger fragments are usually found in shallow areas near the stream mouth.

4. Oyster shell: Throughout a major portion of the world, the oyster reef is one of the most significant features of estuaries, usually being found near the mouth of the estuary in a zone of moderate wave action, salt content, and turbidity. It is often a major factor in modifying estuarine current systems and sedimentation, and may occur as an elongated island or peninsula oriented across the main current, or may develop parallel to the direction of the current.

GROUP II—HYDROGRAPHIC

A. Circulation. Circulation patterns are the result of combined influences of freshwater inflow, tidal action, wind and oceanic forces, and serve many functions: Nutrient transport, plankton dispersal, ecosystem flushing, salinity control, water mixing, and more.

1. Stratified: This is typical of estuaries with a strong freshwater influx and is commonly found in bays formed from "drowned" river valleys, fjords, and other deep basins. There is a net movement of freshwater outward at the top layer and saltwater at the bottom layer, resulting in a net outward transport of surface organisms and net inward transport of bottom organisms.

2. Non-stratified: Estuaries of this type are found where water movement is sluggish and flushing rate is low, although there may be sufficient circulation to provide the basis for a high carrying capacity. This is common to shallow embayments and bays lacking a good supply of freshwater from land drainage.

3. Lagoonal: An estuary of this type is characterized by low rates of water movement resulting from a lack of significant freshwater influx and a lack of strong tidal exchange because of the typically narrow inlet connecting the lagoon to the sea. Circulation whose major driving force is wind, is the major limiting factor in biological productivity within lagoons.

B. Tides. This is the most important ecological factor in an estuary as it affects water exchange and its vertical range determines the extent of tidal flats which may be exposed and submerged with each tidal cycle. Tidal action against the volume of river water discharged into an estuary results in a complex system whose properties vary according to estuary structure as well as the magnitude of river flow and tidal range. Tides are usually described in terms of the cycle and their relative heights. In the United States, tide height is reckoned on the basis of average low tide, which is referred to as datum. The tides, although complex, fall into three main categories:

1. Diurnal: This refers to a daily change in water level that can be observed along the shoreline. There is one high tide and one low tide per day.

2. Semidiurnal: This refers to a twice daily rise and fall in water that can be observed along the shoreline.

3. Wind/Storm tides: This refers to fluctuations in water elevation to wind and storm events, where influence of lunar tides is less.

C. Freshwater. According to nearly all the definitions advanced, it is inherent that all estuaries need freshwater, which is drained from the land and measurably dilutes seawater to create a brackish condition. Freshwater enters an estuary as runoff from the

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land either from a surface and/or subsurface source.

1. Surface water: This is water flowing over the ground in the form of streams. Local variation in runoff is dependent upon the nature of the soil (porosity and solubility), degree of surface slope, vegetational type and development, local climatic conditions, and volume and intensity of precipitation.

2. Subsurface water: This refers to the precipitation that has been absorbed by the soil and stored below the surface. The distribution of subsurface water depends on local climate, topography, and the porosity and permeability of the underlying soils and rocks. There are two main subtypes of surface water:

a. Vadose water: This is water in the soil above the water table. Its volume with respect to the soil is subject to considerable fluctuation.

b. Groundwater: This is water contained in the rocks below the water table, is usually of more uniform volume than vadose water, and generally follows the topographic relief of the land being high hills and sloping into valleys.

GROUP III—CHEMICAL

A. Salinity. This reflects a complex mixture of salts, the most abundant being sodium chloride, and is a very critical factor in the distribution and maintenance of many estuarine organisms. Based on salinity, there are two basic estuarine types and eight different salinity zones (expressed in parts per thousand-ppt.)

1. Positive estuary: This is an estuary in which the freshwater influx is sufficient to maintain mixing, resulting in a pattern of increasing salinity toward the estuary mouth. It is characterized by low oxygen concentration in the deeper waters and considerable organic content in bottom sediments.

2. Negative estuary: This is found in particularly arid regions, where estuary evaporation may exceed freshwater inflow, resulting in increased salinity in the upper part of the basin, especially if the estuary mouth is restricted so that tidal flow is inhibited. These are typically very salty (hyperhaline), moderately oxygenated at depth, and possess bottom sediments that are poor in organic content.

3. Salinity zones (expressed in ppt):

a. Hyperhaline—greater than 40 ppt.

b. Euhaline—40 ppt to 30 ppt.

c. Mixhaline—30 ppt to 0.5 ppt.

(1) Mixoeuhaline—greater than 30 ppt but less than the adjacent euhaline sea.

(2) Polyhaline—30 ppt to 18 ppt.

(3) Mesohaline—18 ppt to 5 ppt.

(4) Oligohaline—5 ppt to 0.5 ppt.

d. Limnetic: Less than 0.5 ppt.

B. pH Regime: This is indicative of the mineral richness of estuarine waters and falls into three main categories:

1. Acid: Waters with a pH of less than 5.5.

2. Circumneutral: A condition where the pH ranges from 5.5 to 7.4.

3. Alkaline: Waters with a pH greater than 7.4.

PART 922—NATIONAL MARINE SANCTUARY PROGRAM REGULATIONS

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APPENDIX J

TEXAS COASTAL MANAGEMENT PROGRAM REVIEW



TEXAS GENERAL LAND OFFICE
GEORGE P. BUSH, COMMISSIONER

August 19, 2015

Jace Tunnell
Director,
Mission-Aransas National Estuarine Research Reserve
750 Channel View Drive
Port Aransas, Texas 78373

**Re: Texas Coastal Management Program Review of Mission-Aransas NERR 2015-2020
Management Plan
CMP#: 15-1567-F2**

Dear Mr. Tunnell:

Pursuant to Title 31 Natural Resources and Conservation, Part 16 Coastal Coordination Council rules, Section 506.30, the project referenced above has been reviewed for consistency with the Texas Coastal Management Program (CMP).

It has been determined that there are no significant unresolved consistency issues with respect to the project. Therefore, this project is consistent with the CMP goals and policies.

Please note that this letter does not authorize the use of Coastal Public Land. No work may be conducted or structures placed on State-owned land until you have obtained all necessary authorizations, including any required by the General Land Office and the U.S. Army Corps of Engineers.

If you have any questions or concerns, please contact me at (512) 475-3624 or at ray.newby@glo.texas.gov

Sincerely,

Ray Newby, P.G.
Coastal Geologist
Coastal Resources
Texas General Land Office

APPENDIX K

RESPONSES TO WRITTEN AND ORAL COMMENTS

Mission-Aransas NERR Management Plan 2015-2020 Responses to Written and Oral Comments

Development of the Mission-Aransas National Estuarine Research Reserve (Reserve) 2015-2020 Management Plan occurred over a three-year period and included direct input from all Reserve staff members, Reserve local partners (GLO, TPWD, TxDOT, USFWS, TNC, CBLT, CBBEP, Fennessey Ranch, ACND, City of Rockport, and Aransas County), and the National Oceanic and Atmospheric Administration's (NOAA) Office for Coastal Management staff. Reserve staff initially discussed the Management Plan at a staff retreat (February 2012), and following these discussions, Program Coordinators were each required to develop drafts of Plan components that related specifically to their programs. Local partners were allowed several opportunities to provide input to the Plan throughout the course of its development through the Reserve Advisory Board (RAB). Special sessions were held at multiple RAB meetings (August 2012 and March 2015) to specifically discuss the Plan and seek feedback from local partner agencies and organizations. RAB members were also allowed the opportunity to comment on a full draft of the Plan prior to its submission for review by NOAA. Staff from NOAA's Office for Coastal Management provided input throughout the development of the Plan.

NOAA's Office for Coastal Management reviews and approves the plan after ensuring sufficient opportunity for comment by the public, per 15 Code of Federal Regulations 921.33. Once the Management Plan has been approved by NOAA's Office for Coastal Management, a Federal Register Notice announcing a 30 day public comment period is published. The public comment period for this plan was published in the Federal Register on October 1, 2015 and the comment period ended on October 31, 2015.

Notices were also published on the Reserve website, social media pages, and in local newspapers to notify the public of the opportunity to comment on the Plan. Additionally, a public meeting was held on October 13, 2015, 5:30pm at the Bay Education Center in Rockport, Texas to provide the public with the opportunity to hear an overview of the Plan and provide comments orally or in writing. After the required 30 day public comment period, revisions to the document were made, where appropriate.

Specific comments received on the plan are noted below in bold and are followed by a description of how the Mission-Aransas Reserve addressed the comment.

- **San Jose Island should be considered by the Reserve as a high priority for land acquisition:** The Mission-Aransas Reserve recognizes the high ecological value of the habitats located on San Jose Island and agrees that this is an important area for future conservation easements or fee simple acquisition. San Jose Island is included in Table 9.2 as a priority geographic location for acquisition (page 222). The Reserve recognizes the importance of all geographic locations identified in Table 9.2, including San Jose Island, but it was necessary for the Reserve to narrow down the list of priority locations to a subset of projects that could potentially be accomplished in the next five years. Although San Jose Island was not included in the shorter project list, the Reserve will continue to keep this important area on their priority list for acquisition during future management plan revisions.
- **The Reserve should include the establishment of a “Friends Group” as an action in this five-year plan:** The Reserve agrees with the need to pursue the development of a Friends Group. The Reserve states in the Administration Plan that it will “Develop and operate a program for gifts to enhance Reserve activities.” It goes on to further say that UTMSI and the Reserve Director will develop and operate a program to encourage gifts to the Reserve and that a gift program can be accomplished by creating a “Friends Group” (page 157).
- **Misspelling of the word “seagrass” on page 100:** Spelling mistake was corrected.