

Final Report
on
Burnet Bay Wetland Habitat and Water Quality Protection Project

TCEQ Contract # 582-7-77831

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Prepared for:



A PROGRAM OF THE TCEQ

Galveston Bay Estuary Program
17041 El Camino Real, Ste. 210
Houston, TX 77058

Prepared by:



Galveston Bay Foundation
17330 Highway 3
Webster, TX 77598

TABLE OF CONTENTS

East Bay Wetland Habitat and Water Quality Protection Project

Executive Summary	3
Introduction	3
Project Methodology	4
Project Results	6
Project Conclusions and Lessons Learned.....	7

Executive Summary

The Galveston Bay Estuary Program (GBEP) and Galveston Bay Foundation (GBF) both have named habitat loss as the number one priority problem in the Galveston Bay system. One of the systems most important habitats -coastal wetlands- have decreased in size by approximately 30,000 acres since the mid-1950s. According to GBEP's *The Galveston Bay Plan*, the Comprehensive Conservation and Management Plan for Galveston Bay, the primary causes for these losses are subsidence and erosion. *The Plan* names the restoration, creation, and protection of wetlands throughout Galveston Bay as the highest priority within the Habitat Protection Action Plan.

The project also implements the *Habitat Conservation Blueprint*, a document developed by the Galveston Bay Foundation in conjunction with state and federal resource agencies, conservation non-profit groups, academia, industry, and citizens, identifying high priority conservation sites. The *Blueprint* inventories 170 sites around Galveston bay, many of them wetlands, in need of restoration or conservation. The *Blueprint* identifies marsh restoration including raising the site elevation with dredge material, and planting marsh vegetation. The *Blueprint* points to subsidence as the main cause for wetland loss within Burnet Bay.

Introduction

Burnet Bay is located west of the city of Baytown and south of the intersection of Interstate 10 and Lynchburg Road. It is bounded by Lynchburg Road and the Lynchburg Ferry to the west, residential properties to the north and east, and the Baytown Nature Center (formerly the subsided Brownwood Subdivision) to the south. Burnet Bay is directly across the Houston Ship Channel from the San Jacinto State Park. The newly restored Goat Island lies in between the Houston Ship Channel and the mouth of Burnet Bay, providing some protection from ship wakes to the Bay's shores.

Historical aerial images dating back to 1944 show that Burnet Bay between the northwestern shoreline and Lynchburg Road was bounded by rather extensive wetlands. A gradual loss of these wetlands occurred between 1944 and 1969. A large water reservoir was constructed on the opposite side of Lynchburg Road in the 1970s, and by 1978, in a very sudden change, nearly all of these wetland habitats were lost. Today, only two small emergent landforms remain: the larger is a short peninsula attached to Lynchburg Road, the smaller is a small island about $\frac{1}{4}$ of the way across Burnet Bay. Wading fishermen often access Burnet Bay by walking out from Lynchburg Road along a submerged shoal towards the small island. Although Burnet Bay is considered an excellent area to fish for redfish and spotted seatrout, a fish consumption advisory has remained in effect since September 1990 for all species of catfish and blue crabs due to dioxin and PCB contamination. This advisory was expanded to include spotted seatrout in 2008. Also, some of the residential properties along the north and east shorelines of Burnet Bay have experienced failing septic systems, and Harris County has prosecuted at least one property owner for discharging directly into the Bay.

The proposed Burnet Bay restoration project aims to restore intertidal marsh elevations within the heavily subsided segment of Burnet Bay adjacent to Lynchburg Road. Raising the elevation of this area to intertidal marsh levels (by constructing mounds and earthen berms) and planting marsh vegetation would result in restored marsh functions, including habitat and feeding grounds for fish, water quality improvements, and shoreline protection.

Tasks associated with these goals included:

- Establishing a steering committee.
- Develop a site plan, including a set of engineering drawings.
- Conduct sediment and water quality analyses to determine if it is safe and desirable to conduct planned activities in Burnet Bay.
- Communicating progress and results.

Project Methodology

A steering committee was formed consisting of project partners and experts from the U.S. Fish and Wildlife Service Texas Coastal Program, Galveston Bay Estuary Program, NOAA Restoration Center, NOAA Fisheries Habitat Conservation Division, USDA Natural Resources Conservation Service, NRG Texas, Port of Houston Authority, Harris County Health Services, Texas Parks and Wildlife, and Galveston Bay Foundation. The steering committee met several times over the project period to discuss project planning, implementation and progress.

HDR was retained for consulting, engineering and design purposes for the project.

Services provided by HDR include:

- Project review
 - Review of historical aerials, acquire new aerial photograph.
 - cursory environmental assessment to identify sensitive habitat within project area
 - Steering committee meeting to discuss findings of initial field investigations (to include memorandum document)
- Data Collection
 - Topographic, bathymetric, and magnetometer surveys
 - Geotechnical and chemical analysis of project area
 - Provide memorandum document for steering committee review
- Conceptual Design
 - Prepare Alternative Analysis Document for steering committee review and discussion
 - Permitting
 - Act as GBF's agent in USACE permitting process
 - Prepare permit application, provide required drawings, respond to USACE and public comments regarding the permit application
- Detailed Design
 - Develop data and design parameters specific to steering committee's design choice
 - Develop detailed design drawings and specifications required for bidding and construction purposes
- Bidding Assistance
 - Prepare and distribute bid documents
 - Hold pre-bid meeting

- Answer questions concerning bid procedures, etc.
- Review received bids and make contractor selection recommendation
- Construction Administration
 - Hold pre-construction meeting with selected contractor
 - Issue Notice to Proceed
 - Review and process contractor submittals, payment requisitions, and conduct construction observation

Beginning in January, 2007, the steering committee met several times with HDR to discuss the project site, data collected, and project design direction. Including in these discussion was the discussion of potential sediment contamination. After sediment analysis it was determined that the sandy areas of Burnet Bay in which the project was designed to be constructed was safe to proceed. However, it was determined that deeper areas of the bay that contained more organic materials exceeded published contamination thresholds. These areas are being avoided by all aspects of this project. Boring results are included as part of this report.

Once the contamination issue was resolved, attention was turned to project design. The steering committee suggested a design using in-situ dredge material to create habitat mounds. Once this was determined HDR proceeded with USACE permitting process and GBF proceeded with lease application from the Port of Houston Authority.

During the time of awaiting USACE permit, GBF was approached by two Houston ship channel industrial companies with the prospect of beneficially using dredge material from their projects. GBF and HDR spent several months in discussions with these companies in hopes of being able to beneficially use their material. However, neither of these options panned out as one company was not convinced in-situ containment levees would be able to stand up to the rate of material discharge they wanted to dredge. They were not willing to slow down dredging process to insure levees would withstand the dredging rate. The second company's project timeline didn't match the Burnet Bay Project's timeline for completion so discussions couldn't move forward. Although neither BU project was able to work out relationships have been formed with these companies which allows for potential cooperation on future projects.

HDR stayed in close contact with Army Corps of Engineers (USACE) in regards to the permit status for the project. GBF executed a final permit with USACE for the project on February 3, 2009. Permit SWG-2008-00127. Lease from the Port of Houston was issued December 1, 2008. PHA File number: 2008-0283 and 2008-0331

GBF advertised for bid proposals in the Houston Chronicle print edition on January 18th and 25th. The advertisement ran continuously between those dates on the online edition of the chronicle. A pre-bid meeting was held at GBF offices on January 26th for potential bidders. Bidding for project construction was open until until February 6, 2009. A total of eight bids were received by the close of bidding. RLB Contracting was selected to construct the project.

During the pre-bid meeting it was brought to HDR and GBF's attention that there were oysters in the borrow area of the project. January 28th GBF and HDR visited the project site and confirmed oysters were indeed in portions of the project area. NOAA and TPWD staff was notified and GBF worked closely with NOAA and TPWD to redesign the project to avoid impacts to oysters in the area. An additional four site visits followed in March to locate oyster populations within and adjacent to the project layout. The final project design was received the first week of April.

The contract between GBF and RLB was executed on March 30th. Change order Number one was executed on April 9th. Change order number one allows for the acceptance of the final project design as it was different from the design included in the bid documents. Design change occurred to avoid impacts to oyster habitat. Also the change order mandated the use of silt curtains to contain sediments adjacent to oyster habitat during construction. Prior to the discovery of oysters the use of silt curtains was not required. Lastly the change order calls for a final construction completion date of August 28, 2009. A notice to proceed letter was issued to RLB on April 13th pending a pre-construction meeting before work can begin.

A pre-construction meeting was held at GBF office April 30, 2009. At this meeting construction timelines as well as other contractor obligations were discussed. RLB plans to move forward with pre-construction surveys during the month of May. RLB is hopeful to mobilize construction equipment to the site by June 1, 2009. The contract agreement has a completion date on or prior to August 28, 2009. A construction timeline provided by RLB is included with this report.

As this grant agreement ends prior to project construction GBF will provide GBEP an additional report including photos at a later date. Additionally, GBF will provide GBEP with site visit reports as provided to GBF by HDR. A report for site visit one is included with this report.

Project Results

At the conclusion of this grant agreement, May 31, 2009, all required tasks have been completed. These include: Assembling a project steering committee, Developing a site plan, including a set of engineering drawings (final design drawings included with report), and conduct sediment and water quality analysis. As designed the project is expected to restore approximately 33.5 acres of intertidal marsh complex.

The selected construction contractor began mobilizing resources to the project site the last week of May. Construction is expected to begin the first half of June.

GBF will provide GBEP with additional reports throughout the construction process and will update this section of final report once the project is completed.

Looking Ahead

Construction of the Burnet Bay Wetlands Restoration Project will occur over the next few months, with a completion date of August 28, 2009.

If site conditions are favorable GBF plans to host a fall Marsh Mania event (also supported with TCEQ/GBEP funds) at the project site. It is estimated that the event would be held sometime in October 2009. GBF will also seek cooperate groups to participate in private planting dates as well as contract some of the planting of the site.

Project Conclusions and Lessons Learned

From this project GBF takes away one extremely important lesson learned. This lesson is to know your project site first hand, regardless of if a consultant has been secured or the knowledge and experience that exists within your steering committee.

Know your site! This was a hard lesson learned by GBF and its partners. This lesson is courtesy of finding out oysters were located within the project area in the very late stages of the project. HDR, GBF, nor project partners were aware nor expected to find oysters in Burnet Bay. The presence of oysters was brought to HDR and GBF's attention by a prospective contractor during the pre-bid meeting. In hindsight, GBF is grateful that that contractor was at the meeting and brought it top everyone's attention. If GBF had moved forward with the project as planned and severely impacted oyster habitat it would not have been good on several levels. First off it are the impacts to the oysters themselves. It would not have been in GBF's or any of its partners interest to destroy oyster habitat. Secondly if the project would have moved forward and the oyster habitat information would have come out after the project and the oysters were impacted it could have created a firestorm of bad publicity for HDR, GBF, and project partners. This bad publicity would be exacerbated by the recent effect hurricane Ike had on Galveston bay oyster populations.

Finding out about the oysters very late in the project created its other problems. It delayed signing of construction contract for over one month as GBF and partners surveyed the Burnet Bay oyster population. This caused a lot of stress for GBF staff as the project was already feeling a time crunch with several grants ending in fall and summer of 2009, with no extensions available, the entire project was now in jeopardy. GBF worked tirelessly with TPWD and NOAA staff to survey oyster locations and redesign the project to avoid impacts. After countless hours in the field a consensus was reached between HDR, GBF, TPWD, and NOAA that impacts have been avoided and a final project design was created. Throughout this process RLB was kept up to date as to findings and had no objections to the final project design.

An amendment was made to the construction contract now that the extent of oyster population was known in Burnet Bay. RLB is now required to use silt curtain during construction to protect oysters from temporary turbidity within Burnet Bay. Silt curtains were not required by USACE or TCEQ, through the permitting process. This added \$50,000 to the overall cost of construction.

The lesson here is to know your site first hand. Even if you have secured the services of a highly respected, highly compensated consultant, they can miss things as in this case.

Enclosures:

Sediment and water quality analysis overview
Final project design drawings
Project construction timeline
Site visit one report