

Final Report

for

Contract No. 582-9-84978

West Galveston Bay Watershed Conservation Project

From

**River Systems Institute
Texas State University – San Marcos
Dr. Warren Pulich, Jr.
Principal Investigator**

To

**Galveston Bay Estuary Program
Texas Commission on Environmental Quality
Clear Lake, Texas**

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Executive Summary

In this project, land conservation programs were investigated as a mechanism to protect water quality and preserve critical native habitats adjacent to West Galveston Bay, Texas. Halls and Chocolate Bayous comprise the major waterways of high aesthetic, ecological and environmental value in this region. A regional inventory identified properties considered Conservation Sites in these bayou subwatersheds with high value for: water quality protection, native terrestrial habitats, and coastal wetlands, e.g. scarce, native coastal 'pothole prairie', terrestrial native brushlands/woodlands, and riparian habitats, all within 10 mi of West Galveston Bay. The 'Pothole prairie' habitat represents a limited, ecologically unique, coastal prairie habitat with depressional wetlands, transitional between true uplands and estuarine marshes, which is unusable for farming purposes. Because it lies at an elevation of approx. 5 ft to less than 8 ft elevation, the area is subject to serious flooding from hurricane storm surge and rainfall runoff, making it very unsuitable for development. The riparian and terrestrial habitats serve a variety of coastal wildlife and game species. Preservation of such large farm- and ranchlands, often passed down through generations of native Texans, would also preserve some of the regional cultural heritage of Texas.

A variety of federal and state programs provide dedicated funding for Coastal Wetlands Conservation purposes. Permanent acquisition or conservation easements on wetland acreages can be funded under the CWPPRA program (Coastal Wetlands Planning, Protection, and Restoration Act), through USFWS/NOAA, or the Texas Farm and Ranch Lands Conservation Program (TFRLCP) under auspices of the Texas General Land Office. TFRLCP was set up by the Texas Legislature to facilitate the purchase of agricultural conservation easements or purchase of development rights to protect agricultural and ranch land from development. Coastal Impact Assistance Program (CIAP) and USDA-NRCS funding are also available for similar types of coastal land easements or acquisitions. NRCS, in particular, has the Wetlands Restoration program (WRP) that can control runoff from rural septic systems or agriculture operations through assimilation by riparian vegetation and special drainage facilities or agricultural field levees.

This project constituted a continuation phase of the West Galveston Bay Watershed Conservation Initiative developed in 2007 by the Galveston Bay Estuary Program (GBEP). As part of the GBEP Conservation Initiative, a watershed advisory group (USFWS, TPWD, NRCS, TCEQ, TPL, H-GAC, GBF, TNC, County parks, etc.) provided technical and conservation planning assistance and facilitated stakeholder participation, focused on the Halls and Chocolate Bayous region. This group was designed as a way to collaborate

between various resource management and conservation stakeholders in the region interested in preserving native wetlands and vegetated upland habitats on undeveloped lands, farms, and ranches.

TSU-RSI served as coordinator and facilitator of the advisory group, and led the effort to locate and contact selected stakeholders to begin negotiations on potential land conservation projects. During this 2009-2011 project, we identified 7 key sites in the Halls and Chocolate Bayou region that could preserve significant amounts of the woodlands, grasslands of the “pothole prairie” region, and riparian areas, along these two environmentally sensitive bayous.

INTRODUCTION

The health and productivity of the Galveston Bay system are threatened by continued rapid growth in rural populations and suburban development as the Houston metroplex expands. Since the 1950s, the Galveston Bay estuarine ecosystem has lost a *net* of 35,000 acres of wetlands due to human influence, at least half of which was concentrated in the West Bay watershed (White et al, 1993). During that time, West Bay lost nearly all of its seagrasses to shoreline development, water quality deterioration, and other human factors (Pulich and White, 1991). Continued wetland loss and increased pollutant loadings are likely within the West Bay area, as Galveston County and Brazoria Counties are growing rapidly, and populations are expected to increase by about 40 % by 2025 (H-GAC, 2003). Much of this growth occurring in the West Bay watershed is concentrated along bay and bayou shorelines, impacting fringing marshes and riparian corridors, respectively, vital to water quality protection and fish and wildlife habitat.

The highly productive West Galveston Bay system contains extensive fresh, tidal and brackish marshes, coastal prairies pock-marked with freshwater depressional wetlands created by ancient stream meanders (“pothole prairie”), and forested wetland and riparian areas associated with its numerous small bayous and streams. Because of these extensive natural features and relatively high water quality, West Bay and its watershed support an abundance and diversity of fish and wildlife, including recreationally and commercially important fish and shellfish, resident and overwintering birds and waterfowl, and neotropical migratory birds. These extensive wetlands and grassland prairies help to protect water quality in the bay and its tributaries. In addition, the watershed area is used extensively for recreation, and contributes greatly to the overall aesthetics of the Galveston Bay system, and to vital ecotourism-based sectors of the Houston economy.

Currently, the West Galveston Bay area is one of the more pristine regions within the greater Galveston Bay system, and most bay and stream segments within the area are not currently impaired, notably Chocolate, Bastrop, and Halls Bayous. Highland and Marchand Bayous were fairly recently (2002) 303(d) 5a-listed for elevated bacteria, and are now 303(d) 5a-listed intermittently for low dissolved oxygen levels. Similarly, Chocolate Bay and West Bay are 303(d) 5a-listed for high bacteria in oyster waters. However, there is concern among some local resource managers that increased growth in this latter target area will result in increased impairments, and that it is important to implement conservation practices, including the protection of wetlands and natural areas, to help reduce the impacts on water quality. Clearing of riparian woodlands and shrublands for grazing and housing, and channelization of streams or installation of storm drains and septic systems within the floodplain, are potentially damaging factors that

come with improperly planned and uncontrolled rural development.

This watershed project was a continuation of the previous land conservation project initiated under the auspices of Galveston Bay Estuary Program (2006-08) to protect water quality, provide habitat for fish and wildlife, and preserve the biological integrity of West Bay ecosystems. That conservation program was aimed at identifying watershed lands/properties that comprise wetlands, native woodlands and coastal prairie, and riparian areas in the region. GIS land use analyses conducted during the earlier project phase (2006-08) identified significant expanses of wetlands and natural areas, including native riparian areas and pasture lands, with potentially very high conservation value, immediately adjacent to West Bay watershed bayous and streams that would be of particular value for habitat preservation and water quality protection (Colvin 2007). This recent, ongoing project phase was designed to focus on 1) identifying and coordinating with cooperative landowners owning native habitats properties in the Chocolate, Bastrop, and Halls Bayous areas of the West Bay watershed; and 2) developing partnerships with cooperative stakeholders to negotiate and implement land conservation projects.

Two such partnership projects were developed during the earlier project phase (2008), and conservation grant applications were submitted to various Wetland Conservation and Protection Programs. They are represented by two agricultural properties in Brazoria County with adjacent low-lying native coastal pothole prairie or riparian wetlands habitat: 1) the Tres Bayous Farms bounded by Halls Bayou on the east and New Bayou on the west, lying south of Highway 2004, and 2) the Savannah Oaks rice farm on Austin Bayou near Danbury just to the west of Chocolate Bayou. If funding plans under negotiation had been implemented, they would have resulted in conservation easements being placed on both of these properties. At this time, only the Savannah Oaks project is headed for fruition, as will be explained later.

This project summary describes the current project scope for the 2009-2011 period in which land conservation planning was conducted for several additional target properties. Work was done in collaboration with potential conservation easement partners, including Trust for Public Lands, USFWS and conservation groups such as Ducks Unlimited and the local Galveston Bay Foundation. In addition, a special project was subcontracted to Shead Conservation Solutions Inc. to complete land acquisition work for property on Galveston Island which came under contract during the summer of 2011.

PROJECT METHODOLOGY

DESCRIPTION OF STUDY AREA AND TASKS

Figure 1 shows the location of the various West Galveston Bay subwatersheds that were targeted under this project, which extended from Halls Bayou subwatershed on the east to Austin and Bastrop Bayous subwatersheds on the west, and Chocolate Bayou in between, then bounded by Highways 6 and 35 to the north of those subwatersheds. The Halls and Chocolate Bayou regions together (approx. 121,850 total acres) are comprised of 7,830 acres (6.4%) of riparian corridor, 10,607 acres (8.7%) of upland woodlands, 32,350 acres (26.5%) of coastal pastures, 12,472 acres (10.2%) of coastal pothole prairie, and 40,684 total acres (33.4%) of agricultural fields, and 17,910 acres (14.7%) of rural residential or industrial land use. Most of the area lies in largely rural Brazoria County, with a small eastern portion of Halls Bayou subwatershed in Galveston County. The State of Texas Coastal Management Program (CMP) inland boundary line extends mostly along Highway 2004 which runs northeast to southwest from Santa Fe to Lake Jackson.

The 2-year time line for tasks covered under the Project Scope of Work appears in Table 1 below.

Task 1. Conservation Project Advisory Team and Stakeholder Coordination Group

An advisory and stakeholder coordination group (comprised of local government officials, natural resource agency personnel, land trust specialists, and representatives from the business and agricultural communities) was organized during the previous project phase (2007-2009) to work with GBEP. The members from the previous advisory committee (listed in October 2007 GBEP report) agreed to continue in this capacity on the new project, including staff from Texas Parks and Wildlife-Dickinson Office, USFWS-Clear Lake Office, USFWS-San Bernard NWR, USDA-NRCS, TSSWCB, H-GAC, Shead Conservation Solutions, Trust for Public Lands, and Texas Nature Conservancy. Several new members were added with representatives from Land Trusts (Texas Conservation Fund – Andy Jones), State Conservation Programs (Texas Farm and Ranch Lands Conservation Program, GLO – Scott Campbell; Ducks Unlimited – Greg Green), and local Foundations (Galveston Bay Foundation). This advisory group continued to locate landowners and provide a stakeholder forum to facilitate dialogue and provide guidance to the Galveston Bay Estuary Program. In addition, the committee helped maintain oversight to ensure that a transparent, professional process appropriate for the GBEP was followed that would accomplish its watershed conservation mission.

Task 2, Property Identification Process and Stakeholder Interactions.

The GIS-based land use/land cover information developed in the previous grant period (2006-08) (Colvin 2007), as well as plans for public parks, greenbelts, or wildlife management preserves developed by local governments or state/federal agencies, was critically reviewed. Recent National Agricultural Inventory Program (NAIP 2008) aerial photography was also obtained from TNRIS (Austin) and TPWD and reviewed. This led to an integrated, strategic landscape approach to land conservation that essentially follows the planning process known as Green Infrastructure (which uses GIS techniques such as Greenprinting) (Benedict and McMahon, 2006). In this process, sensitive, functional native habitats and landscapes are inventoried, and a regional habitat conservation plan is designed. In our study area, the habitats targeted for preservation and protection were primarily riparian corridor buffers, freshwater wetlands, native woodlands and coastal prairies. An earlier study by Jacobs (2002) had followed a similar landscape approach in the Clear Creek and Dickinson Bayou areas, and this project design was followed in our study.

A critical use of the GIS data from Colvin (2007) was to perform an overlay of the LU/LC layers onto the land parcel data obtained from the Galveston and Brazoria Counties tax appraisal databases. Two practical questions were addressed by this map analysis: 1) What landowners could be identified as property owners of sensitive native habitats on their parcels?; 2) Which native land cover (habitat areas that were observed in the regional study area were contained within single large or smaller, but contiguous, land parcels? The RSI group also sought temporary assistance from land conservation specialists under professional services contracts to approach landowners once potential properties have been identified (eg. Mr. Fred Palmer and Shead Conservation Solutions Inc.).

Task 3. Collaboration and conservation strategies developed with stakeholders for additional project sites identified by advisory group.

Once contact and communication with a potential stakeholder/landowner were begun, the selection of the “right” land/habitat conservation strategy was flexible. Depending on funding sources available, potential strategies could include fee-simple acquisition, acquisition of conservation easements, purchase of development rights, or other appropriate long-term mechanism. While all of these strategies were familiar to the RSI team, the feasibility of using a particular strategy would ultimately depend on the site available, and had to be appropriate for the landowner and circumstances at that site.

At this stage, an important element was coordination and partnering up-front with land trusts and conservation groups who represented potential holders of conservation easements or who would purchase the lands or development rights. Several new potential partners have been contacted recently including Ducks Unlimited, Galveston Bay Foundation, and the Conservation Fund (Texas office),

and have shown positive responses. More partners however should be involved (eg. Galveston Bay Foundation, Nature Conservancy, local Land Trusts, etc.). This step is a critical part in the project planning process because negotiations cannot be done solely between the landowner and GBEP, inasmuch as GBEP will not be the ultimate land-holder of acquired lands or the easement/pdr holder in these projects.

Task 4. Collaborations between GBEP, and appropriate advisory committee partners , land trust partners and local landowners for funding from various state and federal grant programs, especially TX General Land Office and USFWS, Land trusts, and NRCS/USDA Wetlands Reserve program). Several programs have been approached to place identified coastal habitats under conservation through the acquisition of conservation easements, purchase of development rights, fee-simple acquisition, or other mechanisms. We continued to work with especially the TGLO and USFWS sponsors. Coastal Impact Assistance Program (CIAP), TX Farm & Ranch Land Conservation Program (TFRLCP), USFWS CWPPRA, and NRCS-Wetland Reserve Program have the greatest potential. Special emphasis can be placed on wetlands, native prairie, and riparian corridor buffers under these programs' guidelines. The RSI group sought temporary assistance from land conservation specialists under professional services contracts to negotiate with landowners of these properties. Due to the sensitive nature of work at this stage, techniques were based largely on establishing inter-personal relationships between landowners and project partners.

Task 5. Production of watershed maps correlating land cover/land use in relation to elevation and topographic features for properties (tax parcels) under consideration. Digital elevation model (DEMs) data of the West Bay watershed system was obtained from the Houston-Galveston Area Council of Governments (H-GAC) based on LIDAR data flown by the State (TGLO) in 2006. This DEM had been developed with 1m elevation intervals. The LU/LC dataset from our previous 2006-08 project was then overlaid with the 1m DEM elevation contour data. This analysis was intended to allow the GBEP advisory team to evaluate the potential for the conservation properties under consideration to be flooded in the event of hurricane storm surge or future sea level rise.

Task 6. Galveston Island, Settegast Road Project (subcontracted to Linda Shead, Shead Conservation Solutions Inc. , P.O. Box 70181, Houston, TX 77270, 713-703-1123, linda.shead@sheadconservation.com)

PROJECT RESULTS

Conservation Properties Identified

1. Hlavinka Property (Tres Bayous Farms). This project was initiated under our previous GBEP contract and comprised ca 8,000 acres of agriculture, pasture, pothole prairie, and riparian wetlands habitats along the west side of lower Halls Bayou below FM 2004. Named Tres Bayous Farms, the 7,973 acre tract is owned by the Hlavinka family from East Bernard, Tx) and is located along Halls Bayou, south of Highway 2004, in Brazoria County near West Galveston Bay (Fig. 3). Half of their parcels border on the westside of Halls Bayou, and the other parcels extend westward, across Persimmon Bayou, to New Bayou. As shown in Fig. 4, approximately 11 % of this 7,900 acreage is pastureland and 45 % farmland under cultivation for rice or sorghum. The remaining acreage includes some 325 ac of riparian shrub/marshlands along Halls and New Bayous, and large pastures (ca 2,943 acres, 37%) of native, coastal 'pothole prairie' habitat in the southern regions nearest West Bay. The property has been owned by the Hlavinkas for a number of years, and pastures/grasslands are maintained primarily for farming, cattle grazing and bird hunting.

Early on, the project was nominated for a CWPPRA grant application by TPWD and USFWS, Clear Lake Office. Preliminary analysis identified nine land parcels (4,501 acres total) of the Tres Bayous area (Fig. 3) as very high priority based on ecological services provided (e.g. providing critical or scarce coastal habitats, protection from non-point source water quality degradation in the bayous, and buffering bayous and native habitats from encroaching development). These 9 parcels (identified as # 1 through 9) in Fig. 3) comprise 2,743 acres of coastal prairie – pothole habitat, 1,304 acres of cultivated rice, 331 acres of pasturelands, and 123 acres of riparian habitat along both Halls and Persimmon Bayous. These nine parcels (4,501 acres total) were recommended for CWPPRA funding under an initial phase of conservation.

However, after almost 2 years of discussion and negotiations with the Hlavinka family, the project came to an impasse in late 2010 due to conflicts from wind turbine leases held on the property. This type of energy development presents serious potential problems for obtaining conservation funding from many of the funding source programs at GBEP's disposal because of environmental impact policies. The land is no longer being considered for CWPPRA funding.

2. Kuchar Property (Savannah Oaks Project). This project, developed in late 2009, will protect the riparian corridor and rice farming fields, ponds, and managed wetlands (463 acres out of 710 acres total) near Danbury at the junction of Austin and Flores Bayous (Fig. 5). In early 2010, an application for a conservation easement was submitted to the GLO Texas Farm and Ranch Land Conservation Program. An award for a \$1 million TFRCLCP grant was made on March 4th, using funds from CIAP, including \$250K from GBEP. Ducks Unlimited

(DU –TX) agreed to be the conservation easement holder, providing wetland management oversight. The project is currently in early implementation stages (survey and appraisal and management plan design), although financial distribution between the federal CIAP agency to the State GLO has required significant effort.

3. Attar Family Property (Lowermost Halls Bayou). This 9,382 total acres site encompassing the lowermost portions of Halls and New Bayous, and bordering Chocolate Bay, is the “historic” International Paper Co. property, well-known for hunting, fishing , and other outdoor activities for its company employees (Fig. 6). The Attar family (Farouk Attar in Houston, Tx) purchased it in the mid-90s, and has leased it out for grazing, hunting, and recently for potential wind turbine energy production. Mr. Fred Palmer, working with the RSI team, began contacting Mr. Attar in summer of 2010, and made arrangements for preliminary negotiations. On October 18, 2010, the team visited with Mr. Attar and made a presentation on the GBEP West Bay Conservation Program, then discussed some specific conservation ideas and applications for his property. Since the site contains predominantly estuarine wetlands and coastal prairie pothole habitat (approx. acres combined), this land is marginal for farming and development because of its low elevation and wetlands status. However, Mr Attar was concerned about putting conservation easements on the property, since he felt it represented undue restriction that would preclude later development.

4. RKWright Property (Upper Halls Bayou Site). This project coordinated by Trust for Public Lands, comprises 1700 acres (900 acres riparian corridor/woodlands, 800 acres agriculture and pasturelands) located on the west side of upper Halls Bayou near the San Bernard NWR unit. The site has the potential to protect a large portion of the remaining native woodlands and riparian habitat in the upper Halls Bayou . The advisory team in 2011 agreed that this would make an excellent candidate property for the GLO TFR LCP, since it is a combination of both farmlands and native riparian habitat. In addition, USFWS is also interested in acquiring the woodlands adjacent to Halls Bayou to produce a more contiguous satellite refuge system in that watershed.

5. Jimmy McCormick Property (Middle Halls Bayou Site). This project, recently identified in summer 2011, would protect the riparian corridor and native pastureland (1219 acres total) near the junction of upper Halls Bayou and a western tributary. As shown in Fig. 7, it lies to the southwest of the San Bernard FWS satellite refuge unit. Negotiations have not yet begun with the landowner, but FWS has expressed an interest in the site.

6. Sanedokos and Paschetag property. This project (for Brazoria tax parcel R151877) was only identified in late summer 2011. Shown in Fig. 7, it has the potential to protect the riparian corridor and native woodlands (329 acres) on the east side of the junction of lower Chocolate Bayou and a tributary north of the INEOS property there. Negotiations have not yet begun with the landowner.

However, the area would provide a natural buffer of high quality woodlands between the INEOS industrial site and Chocolate Bayou waters.

7. Halls Bayou Ranch property (15,000 acres east of Halls Bayou, from Highway 2004 to West Bay shoreline, owned by the Briscoe Production Company)

The scenic Halls Bayou Ranch was visited on Tuesday Aug. 23rd, 2011, arranged by Mr. Fred Palmer with the RSI team. We were able to meet with Mr. Mark Strickland, ranch manager, and spent the day touring this property. Mark gave four of us (including Scott Campbell and Robert Siddall from TGLO, Farm and Ranch Lands Conservation Program) an in-depth tour of a small part of the 15,000 acre ranch, which includes some 5,000 acres of rice farmlands. We were very favorably impressed with the Ranch and Farming operations, since most of the property is native coastal prairie and wetlands habitat, located within 25 miles of the Houston metroplex, which extends from Halls Bayou and Highway 2004 all the way south to the West Galveston Bay margin adjacent to the Attar land. The wetlands management and habitat conservation being practiced on-site is impressive and a testimony to the environmental stewardship of the ranch owners and their operators.

After touring the site and talking with Mr. Strickland, the review team agreed that this site has tremendous potential for conservation projects covered under various funding programs, including the Galveston Bay Estuary Program. Mark told us that they already have 11 Ducks Unlimited wetlands easements on the ranch which are operated in conjunction with the rice farming operations. The water recycling design is very innovative and efficient, and not only during drought periods. We were encouraged to develop additional land conservation project opportunities and approach the ranch owners with proposals. Scott Campbell will be following up with his GLO/FRLCP program, and will be looking for additional partners, both for funding and as easement holders. RSI recommended that the Estuary program should join in these planning efforts, along with some of the Estuary program's partners like Galveston Bay Foundation and DU.

8. Topographic Analysis of Conservation Properties. Fig. 6, presents an overlay of elevation contour data and LU/LC habitat classes for the entire Halls Bayou subwatershed. This graphic illustrates how DEM data could be used to evaluate the drainage and flooding potential for different properties in this watershed. This would be useful in prioritizing parcels based on their wetland habitat or flooding status or in negotiating values of properties under consideration for acquisition. Figs. 7 and 8 provide more detail on elevation of specific properties, in particular several that have been discussed previously such as the Tres Bayous Farms project. Of interest is the fact that all properties examined show a distinct 1-2 m rise in elevation passing from the riparian corridor into upland zones, indicating that the riparian corridor is in fact similar to the FEMA floodplain. This reinforces

the general concept that riparian areas are wetlands and should not be altered or disturbed for development, but should remain as vegetated buffer areas to protect uplands from flooding and to trap and assimilate runoff that otherwise would impair the bayous and streams.

9. Linda Shead Project

This project, under SubContract # 111142, for portions of the legal and due diligence investigations for the acquisition of real property at Settegast Rd. on West Galveston Island on West Galveston Bay, performed the following tasks:

- ☐ See attached list of grant conditions to be incorporated in the purchase agreement, based on the existing authorized funding.
- ☐ See attached clearance letter from the Texas Historical Commission regarding review of the site.
- ☐ Regarding the preliminary appraisal results, the appraiser has conducted necessary investigations for an appraisal of a portion of the Galveston Marquette property, according to Uniform Appraisal Standards for Federal Land Acquisitions. Final appraisal results will be transmitted in an appraisal report by 9/30/11, per the Subcontractor Scope of Work. Preliminary appraisal results indicate the value will be between \$20,000 and \$24,000 per gross acre.
- ☐ Regarding an environmental assessment, a Phase I assessment was not conducted as part of this project, because it has not yet been determined whether the seller might be having that work done for all of their property at this location, which would make a separate environmental assessment unnecessary at this time.

Further Evaluation of Projects

With identification of these 6 potential projects (excluding Savannah Oaks), we can now begin negotiations under specific land acquisition or conservation easement programs. However, each project will require a special conservation management design based on adherence to landowner conditions and program restrictions. One project in particular, the 15, 000 acre Briscoe Production Inc. property near Halls Bayou, is especially promising. Since the site was located just recently as this grant was coming to a close, only cursory discussions and interaction with the landowner have occurred, but it has major potential as a land conservation site.

DISCUSSION and CONCLUSIONS

Tasks for this project were intended to accomplish two goals: (1) provide a regional framework for coordinated land conservation in the unincorporated parts of the West Bay watershed; and (2) conserve wetlands, coastal prairies, riparian corridors, and other valuable native habitats that maintain water quality in tributaries to West Galveston Bay. At this point, we judge that this project has been successful in accomplishing the first goal, with the creation of a well-coordinated land conservation program under the auspices of GBEP, supported by a diverse advisory group of dedicated, local conservation specialists. In regards to the second goal, there has been less tangible success, in the sense that conservation easements or property acquisition have not yet been implemented. However several projects have been recently identified that are now in the initial planning stages for actual negotiations (e.g. Savannah Oaks, RKWright LLP, Smith Woods at Lake Jackson, and possibly Halls Bayou Ranch). The key factor now is for the GBEP Conservation Acquisition Program (CAP) to continue to move forward on these and other potential projects without losing the momentum that has been building in the last year.

Over the last several years, with the economic downturn of 2008-2010, market forces have changed landowner's attitudes towards rural land preservation. Some properties previously targeted by landowners for development may now be amenable for conservation easements or sale to land trusts and public entities. As property taxes have increased, landowners now see conservation strategies as more feasible due to tax incentives compared to outright sale to developers for profit. As circumstances arise and local partners interested in land conservation and stewardship are found, strategies can be evaluated for preserving family heritage properties containing important coastal habitats, as well as continuing agricultural and ranching operations. These properties could also help protect water quality by minimizing residential or agricultural runoff.

Examination of tax parcel maps shows that significant areas of native habitats still exist on large (> 50 acres) parcel tracts. These tracts are often contiguous along the riparian corridor of bayous in the West Bay watershed area. The landowners of these larger properties represent potential contacts for stewardship opportunities that may often be receptive to negotiation when contacted. Mike Lange of San Bernard NWR has found that personal contacts with such landowners can lead to conservation negotiations, even before the property is put on the market or advertised for sale (pers. commun.). We have focused our efforts on identifying landowners of such extensive native habitats.

It is critically important for GBEP to work with its advisory group to locate and approach landowners whose properties meet the desired watershed conservation criteria. This appears to be the most practical and effective method to pursue land conservation and watershed protection. We would encourage GBEP to develop a larger, more active supportive advisory group. If necessary, more formal relationships should be established between GBEP and the advisory group. While voluntary relationships are important, some incentives may need to be offered to speed up the entire process.

Old and new land conservation programs can be applied favorably to accomplish these objectives of habitat protection. Two long-standing programs, the traditional USDA-NRCS Wetland Reserve Program and USFWS Land and Water Program, are well-suited for continued placing of easements on wetlands or fee-title acquisition of lands using federal funds. Ducks Unlimited has continued to leverage its funding through these methods. In the new category, public lands programs such as the GLO TFR LCP and CIAP provide funding sources for preservation of especially coastal properties. These techniques are currently being applied in several of the projects described herein.

The drawbacks of these purely conservation/preservation programs is that multiuse projects are precluded. Landowners wanting to keep their land, but at the same time use it for some business and recreational purposes, are reluctant to place easements or sell-development rights (pdr's) on them in perpetuity. This can severely limit the feasibility and locations of coastal land preservation projects, because of the demand for wind energy production or the extensive distribution of petrochemical/hydrocarbon production facilities throughout the Texas coastal zone. There needs to be long-range planning for somehow designating areas that will accommodate such multiuse purposes, while allowing for conservation of wetlands or other valuable, native coastal zone habitats.

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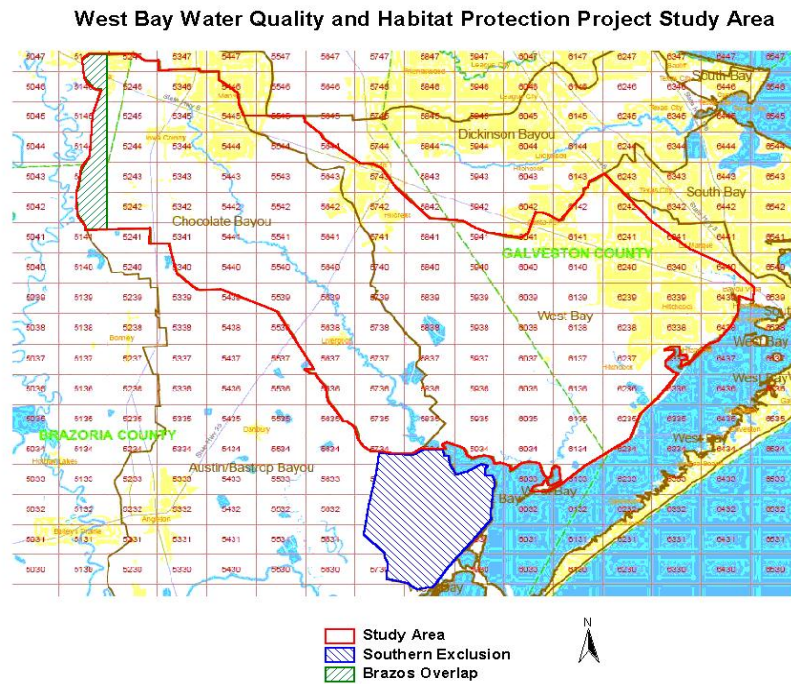


Fig. 1. Study Area for West Galveston Bay subwatersheds of Chocolate Bayou and Halls Bayou.

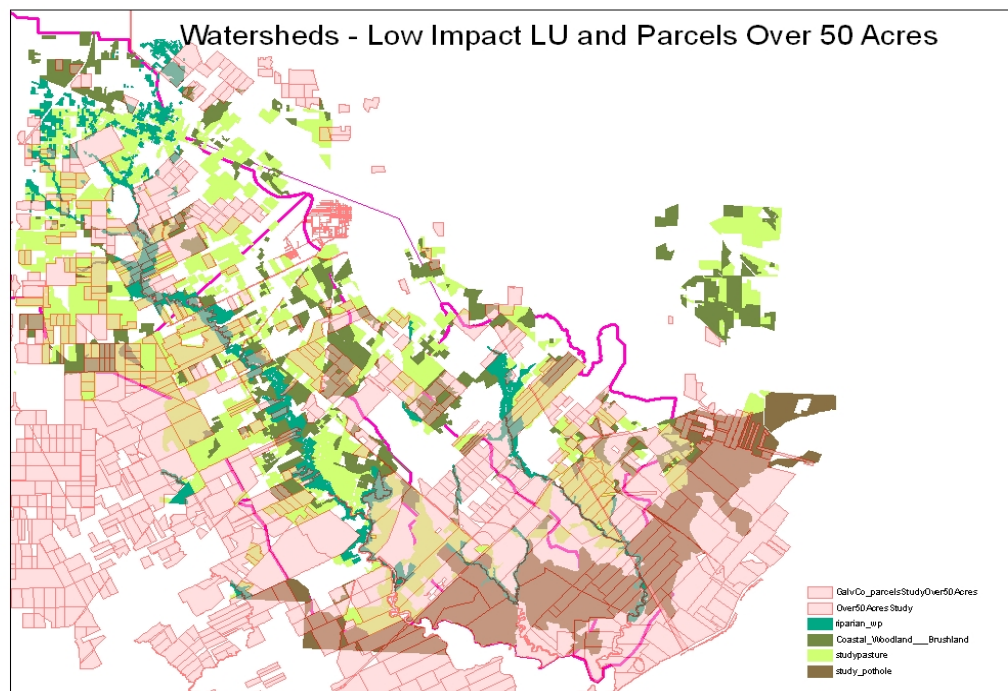


Fig. 2. Study area showing tax parcels 50 acres or larger (in colors) overlaid with classified native habitat classes. Areas in pink consist of human landuses (i.e. residential, agriculture, or industrial).

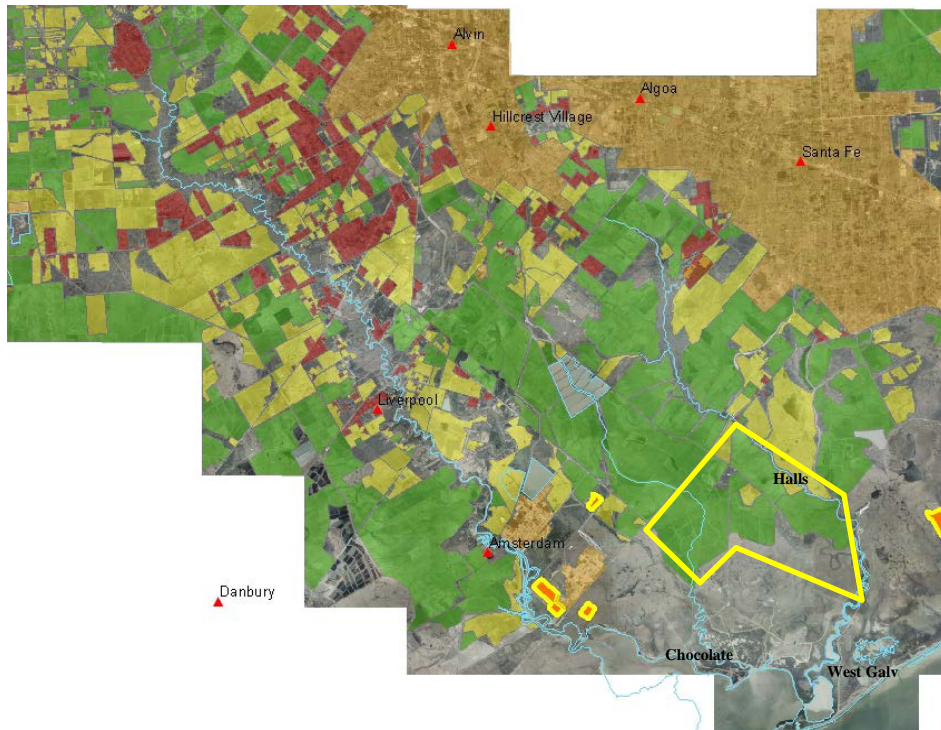


Fig 3. LU/LC classified map of West Galveston Bay study area showing Tres Bayous Farms (in yellow outline) near lower Halls Bayou.

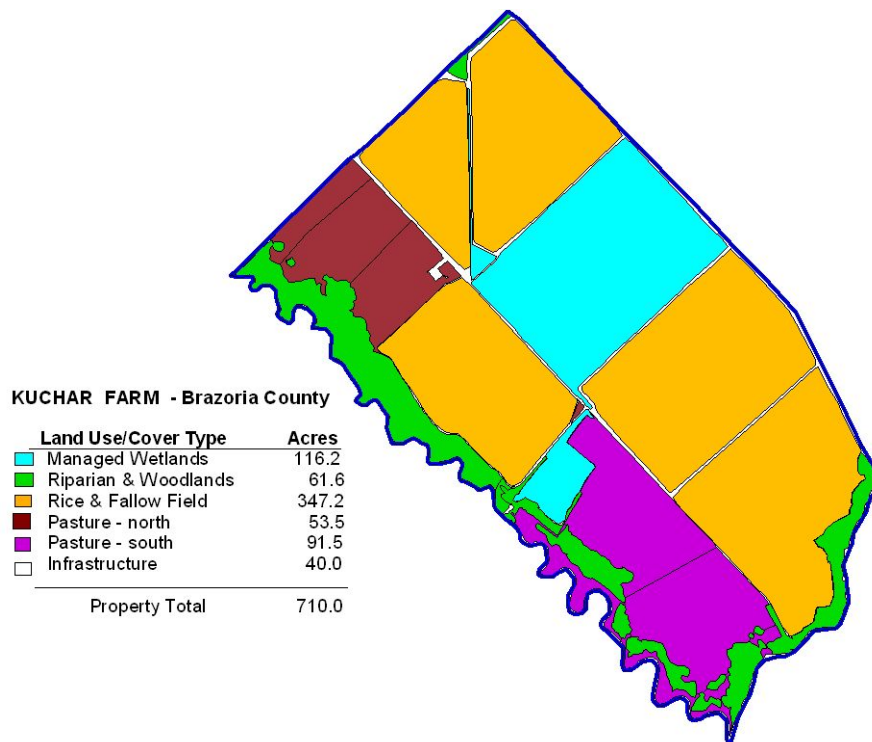


Fig 4. Kuchar Farm (Savannah Oaks parcel) in Austin Bayou watershed to west of Chocolate Bayou. West Galveston and Chocolate Bays .

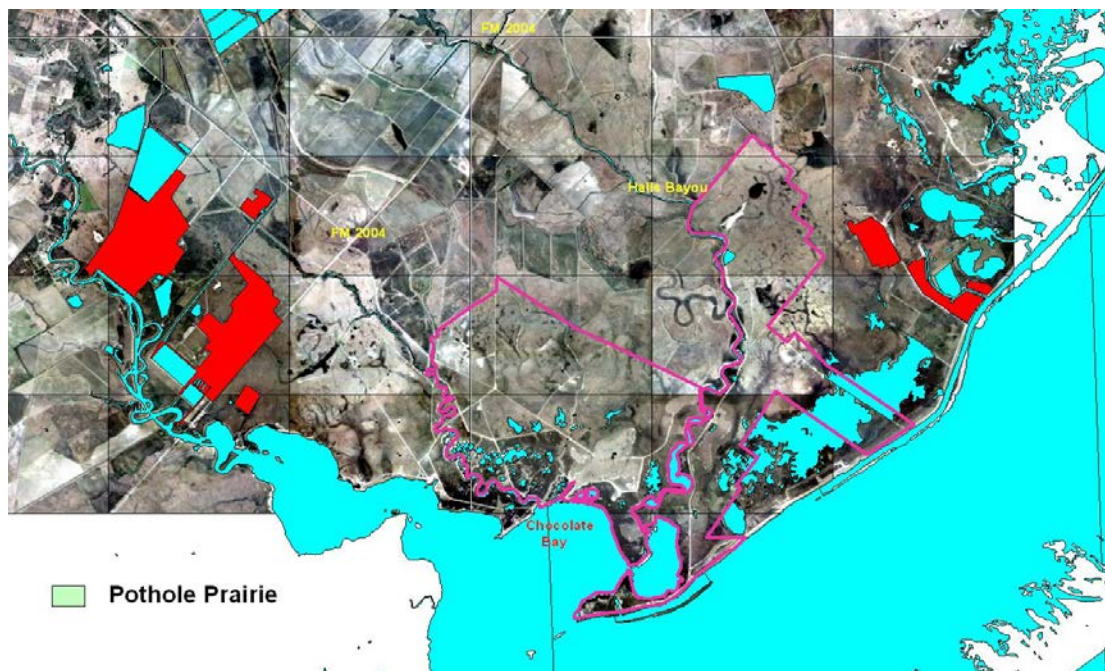


Fig 5. Aerial photograph (unclassified) of southern study area showing Attar Property (outlined in purple) near lower Halls Bayou, adjacent to West Galveston and Chocolate Bays .

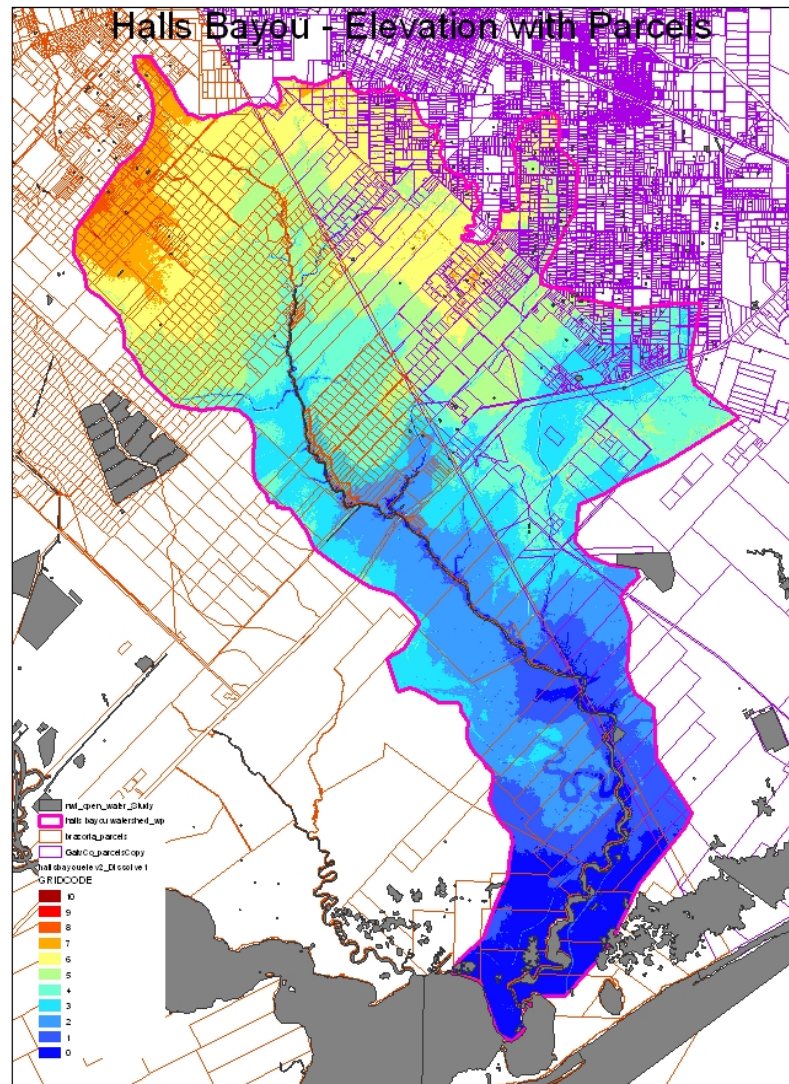


Fig. 6. DEM contours at 1m elevation increments overlaid onto tax parcels for Halls Bayou subwatershed. Elevation ranges from 0-1 m in dark blue at bottom of watershed, to 9-10 m in dark red in upper watershed.

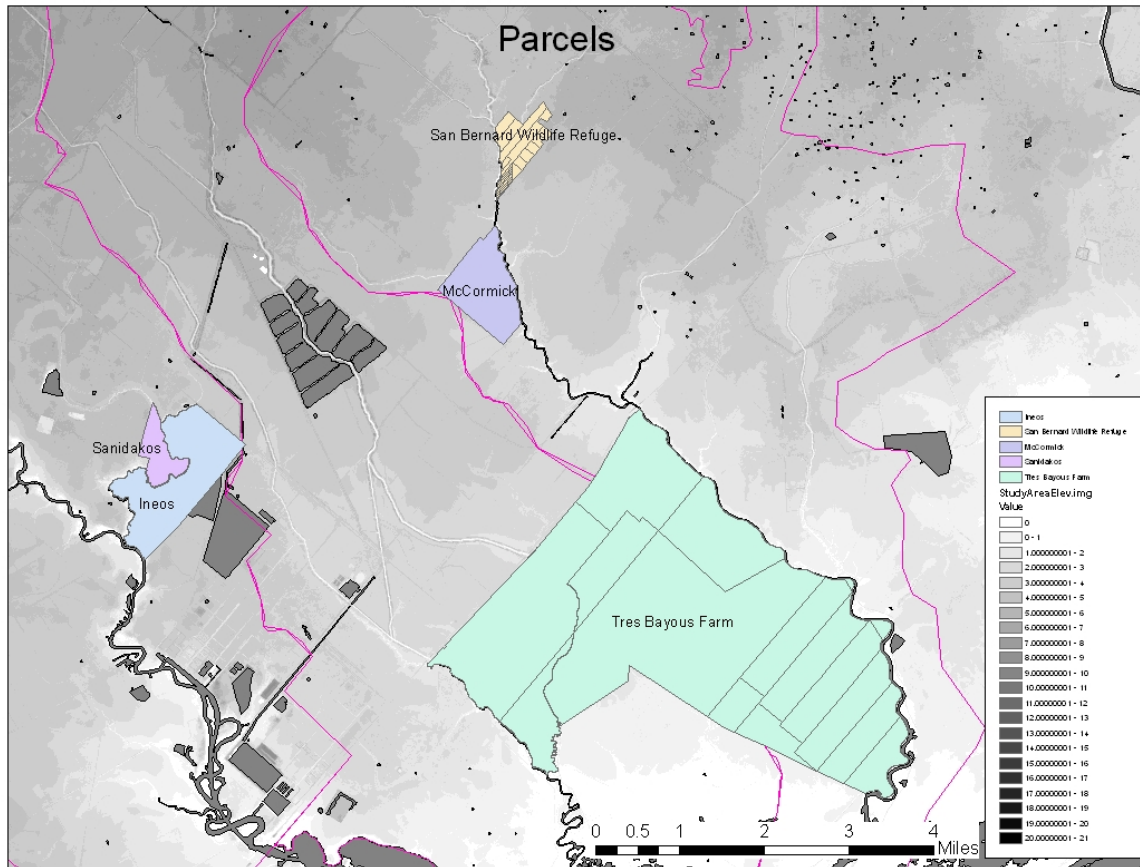


Fig. 7. DEM contours at 1m increments overlaid onto Halls and Chocolate Bayous properties. Elevation ranges from 0-1 m in very light gray at bottom of watershed, to 7-8 m in dark gray in upper watersheds. Several project areas are shown: Tres Bayous Farms, McCormick's, and San Bernard Wildlife Refuge on Halls Bayou; Sanedokos parcel is shown to west off of Chocolate Bayou.

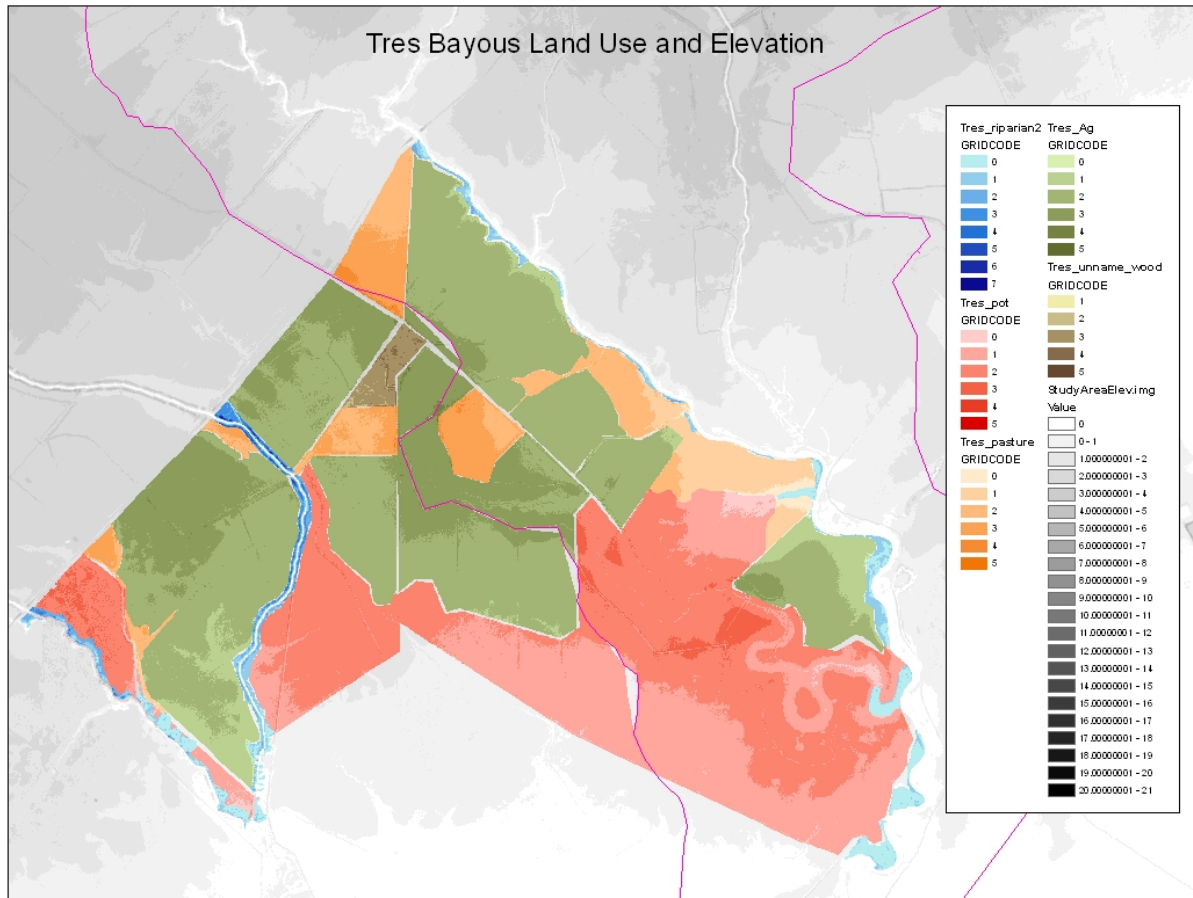


Fig. 8. DEM contours at 1m increments overlaid onto Tres Bayous Farms land use/land cover in the Halls Bayou watershed. Elevation ranges from minimum of 0-1 m in very light pink at bottom for coastal prairie pothole region, to maximum 2-3 m in dark green for agriculture region at top.

[illegible]