GBEP Watershed Conservation Initiative

Halls and Chocolate Bayous and Water Quality Protection by Native Habitats

Final Report
For
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To
Galveston Bay Estuary Program
Clear Lake, Texas
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Abstract/Executive Summary
Implementation of Conservation Programs as a Preventive Strategy to Protect Coastal Watersheds

In this project, land conservation programs were pursued as a mechanism to protect water quality and preserve critical native habitats adjacent to West Galveston Bay, Texas. As rural Galveston and Brazoria Counties rapidly develop, increasing wetland loss, non-point nutrient/ pollutant loadings, and native habitat fragmentation are occurring. Population is expected to increase about 40 % by 2025 within the West Galveston Bay watershed alone. Much of the development will be concentrated along the freshwater bayous, Halls, New, and Chocolate Bayous, unless land conservation mechanisms are applied to protect the existing farms and ranches with their native grasslands and riparian areas. Landcover/ landuse analysis can identify high priority sites based on ecological functions and services (e.g. critical or scarce coastal habitats, protection from non-point source water quality degradation, and riparian habitat buffers). A regional inventory identified 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. Such native habitats and wetlands are excellent buffers from encroaching urban development along the watersheds. Runoff from either rural septic systems or agriculture operations can be buffered by rice field levees and riparian vegetation.

As a result of protecting bayou drainages important to West Bay, estuarine fisheries species would benefit from high-quality, nursery habitat and low-salinity refuge areas in the 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 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, can preserve some of the regional cultural heritage of Texas. Halls and Chocolate Bayous also provide recreational waterways of high aesthetic value for canoeing, kayaking and nature enthusiasts.

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 is also available for similar types of coastal land easements or acquisitions . These programs could permanently preserve the wetlands and grasslands of the "pothole prairie" region, as well as riparian areas along the bayous. Runoff from either rural septic systems or agriculture operations could be assimilated by riparian vegetation and special drainage facilities or agricultural field levees.

This project represents a first implementation phase of the West Galveston Bay Watershed Conservation Initiative which is sponsored 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.) was formed to provide technical and conservation planning assistance and to facilitate stakeholder participation, focused on the Halls and Chocolate Bayous region. This program was designed as a collaboration between various resource management and conservation stakeholders in the region to preserve native wetlands and vegetated upland habitats that in turn function as buffers from encroaching urban development along the watersheds. TSU-RSI served as coordinator and facilitator of the advisory group, as well as approaching selected stakeholders to begin negotiations on potential land conservation projects.

Introduction
West Bay Watershed Habitat Conservation Initiative

This report describes the development and implementation of the West Galveston Bay Watershed Protection and Conservation Project (WBWCP), funded by the Galveston Bay Estuary Program (GBEP) of the Texas Commission on Environmental Quality (TCEQ). The project was designed as a habitat conservation planning initiative that will eventually lead to comprehensive watershed management in two subwatersheds adjacent to West Bay. The focus was on critical, native vegetated habitats, especially riparian, woodland, and coastal prairie in the Halls and Chocolate Bayou subwatersheds. The need for such watershed management is urgent, as this suburban area of the greater Houston metroplex is growing rapidly from residential development. Much of the development will likely be concentrated along bay and bayou shorelines, due to the excessive demand for waterfront properties. Subsequent wetland loss and increased pollutant loadings are likely within the West Bay area, which will impact fringing wetlands vital to water quality protection and wildlife. These factors have the potential to seriously degrade water quality and the ecological productivity in the region's relatively pristine estuarine water bodies and associated watersheds. The West Bay area is also culturally, geographically, and historically unique, featuring large expanses of lands under active rice cultivation and extensive rangelands, many of which are owned by founding families and longtime residents.

The Galveston Bay Estuary Program and River Systems Institute of Texas State University decided to begin working with local stakeholders in the West Galveston Bay watershed to identify natural areas in this region crucial for water quality and wildlife protection, as well as coastal hazard mitigation, and to plan for ways to insure their long-term conservation. We chose to focus on the West Bay watershed of Halls, New, and Chocolate Bayous in Galveston and Brazoria Counties, some of the more pristine, biologically productive regions remaining within the greater Galveston Bay system. This watershed has extensive native wetlands, woodlands, and prairies that help protect water quality in West Bay and its many tributaries. The area contributes significantly to the overall economy of the Galveston Bay system, especially from ranching, farming, and nature-based recreation sectors.

The WBWCP project completed a native habitat and land cover/land use assessment of the watershed using GIS methods to identify and prioritize key natural areas. The next phase of the project involved identifying watershed stakeholders and formation of a watershed planning/steering group comprised of natural resource professionals from federal and state resources agencies, local county governments, conservation non-profit organizations, and private industry to provide strategic guidance and technical expertise for the initiative. We are now actively pursuing conservation through a variety of mechanisms including: 1) Purchase of Development Rights (PDR) under the PDR program administered by the Texas General Land Office; 2) securing conservation easements; 3) fee simple purchase; and other mechanisms. Stakeholders have agreed to work to insure the long-term management of these lands to maximize their conservation value. The West Bay Conservation Initiative aims to preserve the area's unique heritage, an aspiration shared by several state and federal programs including several USDA Natural Resources Conservation Service programs, the Texas General Land Office's Farm and Ranch Lands Conservation Program, and Texas Parks and Wildlife Department.

Project Objectives

(A) Utilizing GIS-based habitat and land use assessment tools, and in coordination with a watershed steering group assembled for this project, identify and plan for conservation of key sites.

(B) Approach local landowners and stakeholders to develop agreements for long-term conservation of 1000 acres of target sites through: 1) acquisition of conservation easements; 2) fee-simple acquisition; 3) purchase of conservation agreements under Purchase of Development Rights (PDR) program administered by the Texas General Land Office; or 4) other appropriate long-term mechanisms.

(C) Establish a mechanism for long-term management of sites to ensure that they remain in compliance with conservation agreements and are maintained for habitat value, including: 1) partnering with land trusts to monitor and manage conservation easements; 2) partnering with natural resource agencies (such as the USFWS National Wildlife Refuge System) or conservation non-profits to hold fee-title for conservation lands purchased and conduct land and wildlife management activities to maintain conservation value; and 3) coordinating with the Texas General Land Office to monitor and manage Purchase of Development Right (PRD) agreements.

Study Area Description and Project Design

The study area (Figure 1) encompasses the watersheds of Chocolate Bayou to the northwest, and Halls Bayous directly to the north, of West Galveston Bay, an area of approx. 50, 000 acres. These watershed areas lie in Galveston and Brazoria Counties, within some 15-25 miles from the Houston, TX metroplex. The small subwatershed located on the south side of the map (southwest side of Chocolate Bay, outlined in blue), and an area on the west side of Chocolate Bayou (outlined in green and hatched), which possibly falls into the Brazos River watershed, are also considered potential sites for later study.

Phase 1. Watershed Inventory of Land Cover and Land Use

This first phase of the WBWCP project addressed 2 main analysis objectives:

1) identification of native habitats that maintain and protect the water quality and wetland functions of these subwatersheds; and,
2) quantitative assessment of the susceptibility to environmental impact for high priority riparian and woodland habitats in the 2 subwatersheds.

The study area from Fig. 1 was inventoried and classified by photodelineation from 2004 HGAC digital color photography, scale 1:24000. Image Classification for land cover/ land uses was completed using a LU/LC classification scheme earlier modified (see earlier work plan version, Task 4) from USGS NLCD and Jacobs study (2000). This work was performed during

2005-2006 by Geography graduate student at TSU, Ms. Corrie Colvin, under supervision by Drs. Pamela Showalter and Warren Pulich.

Classification of the digital imagery for land cover/ land uses was completed and vector polygon data was incorporated into a GIS database. This included a variety of ancillary datasets obtained from TGLO and TNRIS. Final LU/LC maps were made for each subwatershed, as shown in Fig. x below which shows the distribution of native habitats in these subwatersheds. Actual LU/LC acreages are listed in Table xx. These maps allow evaluation of Land Use/Land Cover for Native Habitat Functions (Riparian Corridor, Woodlands, and Prairie Pothole).

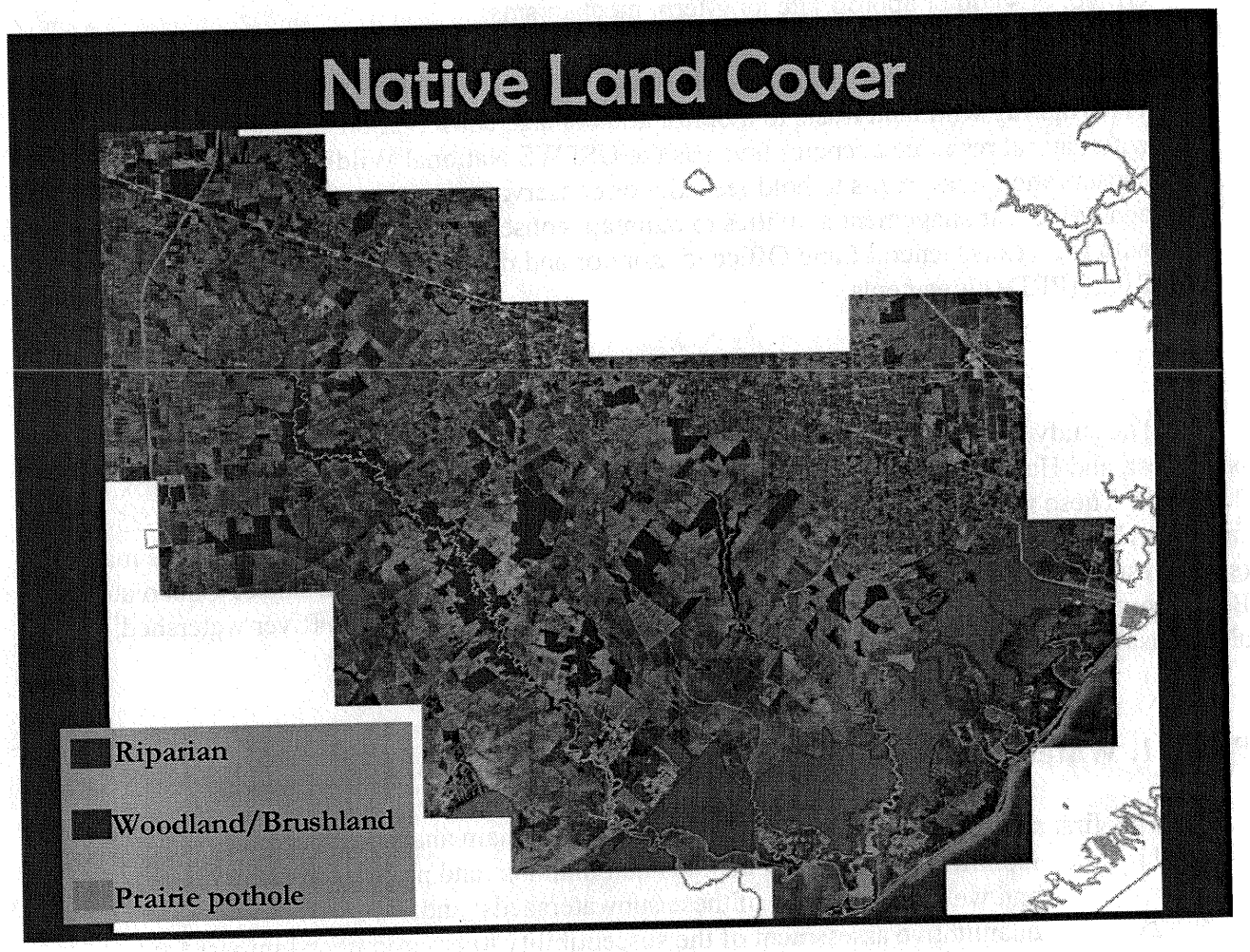

Table 1. LU/LC acreage statistics for Halls and Chocolate Bayous Subwatersheds of West Bay

Land Use/ Land Cover Type	Halls Bayou Acreage	%	Chocolate Bayou Acreage	%
Agriculture	16,624	39%	24,060	30%
Pasture	5,089	12%	27,261	34%
Rural Residential	1,096	3%	10,434	13%
Heavy Urban Development	3,359	7%	3,019	4%
Coastal woodland & brushland	2,016	5%	8,591	11%
Riparian shrub & woodland	1,263	4%	6,566	8%
Prairie Pothole	12,472	30%	0	0%
TOTAL	41,919	100%	79,931	100%

Perform Landscape Modeling using LU/LC Weighting Assignments and Sensitivity Analysis for Native Habitats

Existing models were examined and tested for their applicability to assess desirable and negative criteria for the LU/LC identified in the two subwatersheds. An appropriate example of such a model was found called MARXAN, "Marine Reserve Design for Habitat Conservation using Spatially Explicit Annealing" (Posssingham et al. 2002), which describes the tool that works as an Arcview extension. Another model, Toolbox for Analysis of Mata Atlantica Restoration Incentives (TAMARIN), has been utilized for analysis of socioeconomic and environmental variables within a GIS in order to define areas amenable to conservation activities.

In consultation with Project members and using accepted scientific methodology, land uses identified in the study area can be weighted according to their estimated impact on associated undeveloped areas.

Factors taken into consideration for the weighting analysis included:

1) the amount of land (i.e. size) represented by critical habitat classes,
2) roads and city boundaries,
3) lot lines delineating tax appraisel parcels,
4) vector/raster variables needed for weighting/sensitivity analysis.

For example, different farms may have runoff that differentially impacts West Bay, therefore, agricultural extension agents will be contacted to obtain information about such farms and the farms will be weighted according to their level of impact. Other examples of variables that could be weighted include vehicle runoff contributions from roadways, industrial sites and their surroundings, appraised land value, and whether or not there is public access from a parcel to navigable waters along the Bayous and their tributaries.

Weight assignments will be added to the GIS to enable the software to model which land parcels within the study area can best serve the goal of habitat conservation and watershed protection. Briefly, the weights represent a continuum along which different land uses fall in terms of how they impact the native habitats and wetlands. When the weights from multiple layers of information are added together, they create a "cost theme". The GIS is then instructed to perform a Cost-Weighted Distance Analysis, which results in a map showing areas of different "costs"--in the case of this study, costs will be used to show which native land parcels are more or less attractive for acquisition. Risk maps are examples of such maps developed by this technique, showing the locations of input risk factors, where multiple layers cross each other, and their relative values.

Determine Properties for Water Quality Protection and/or Conservation

The GIS analysis will be used to identify properties that best serve the goal of habitat conservation and watershed protection, as determined by the advisory team. It will be necessary to obtain the most recent information available regarding conservation or development activities on these properties as well as future development plans that may evolve. To this end, it is important to coordinate with the various local municipalities, tax offices, and real estate entities in the watershed area to update development and management plans.

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Phase 2: Advisory Team Coordination and Watershed Planning

During this phase, organized planning meetings were conducted with key resource management agencies, both federal and state, local governmental planning staff, non-governmental organizations, and land conservation specialists... Over the grant period from June 2006 to early 2008, a series of planning meetings were held at the Galveston Bay Estuary Program office to exchange information on land conservation programs being used in the local region , and to organize a group dedicated to achieving common goals under the GBEP Initiative. These meetings finally culminated in October 2007 with the production of a formal planning Workshop attended by some 24 attendees (Table xx). A statement of the Conservation Plan goals, objectives, and strategies is presented below, as well as the Workshop agenda.

West Galveston Bay Habitat Conservation Initiative Plan Goals, Strategies, and Implementation Processes (*Recommendations for Advisory Committee Consideration*)

Project Goals:

Planning for current and potential non-regulatory tools should realistically be applied to assist local communities and private landowners in maintaining the rural landscape and protecting the water quality in the unique West Galveston Bay subwatersheds.

Planning will result in initiation of the implementation phase of this project.

Project Objectives:

1. Develop and coordinate a watershed stakeholder group or other forum acceptable to project representative, facilitating dialogue to provide guidance and support to the overall project. The stakeholder group or other forum will be comprised of local government officials, natural resource agency personnel, conservationists, and representatives from the business, development, and agricultural communities. Meetings should be held at least twice per year.
2. Work with the watershed stakeholder group to identify sites for conservation. Using products and information developed in Objectives 1, 2, and 3, park plans developed by local governments, and other appropriate information, the GRANTEE will work with the stakeholder group and other interested parties to identify and pursue the conservation of lands within the watershed that feature important coastal habitats and are important in protecting water quality.
3. Develop conservation strategies, in collaboration with local governments, for at least three projects that the stakeholder group has identified for conservation. Potential strategies may include fee-simple acquisition, acquisition of conservation easements, purchase of development rights, or any other appropriate long-term mechanism. Initiate and implement at least one conservation project.

Strategies:

1. Purchase development rights and/or acquire land by fee simple in order to preserve and enhance its watershed functions.

2. Work closely with the agriculture sector to provide incentives and technical assistance for agricultural practices that preserve and enhance watershed functions.

3. Work closely with cities, counties, and other units of local government to provide incentives and technical assistance to manage public parks and recreation land in order to preserve and enhance watershed functions.

4. Develop incentives and technical assistance for industrial and commercial lands that can be managed and/or restored for watershed qualities, especially flood-prone properties.

5. Promote the concepts of conservation and sustainable development practices in the region.

Implementation Processes:

There are five implementation processes that are appropriate for the West Bay region, four of which are already part of the GBEP management plan:

1. NGO Partnerships: A wide variety of conservation organizations have commitments to Galveston Bay and GBEP has close working relationships with several of these. We recommend that existing and potential relationships be evaluated in the context of developing cooperative initiatives for the West Bay region. These initiatives can embrace all five strategies.

   The most obvious of these partnerships initially are with The Nature Conservancy and the Houston-Galveston Area Council in their local initiatives in the West Bay region. We recommend that action should be taken to identify specific programmatic areas of coordination and to seek complementary funding. These organizations can also be very important in identifying specific tracts of land that might be suitable for one or more of the five strategies.

2. Private Sector Partnerships: The private sector has two "needs" that can be met through partnerships with GBEP and its partners. Those needs are (1) cost effective compliance with environmental regulations, and (2) a favorable public image. These partnerships can apply to strategies 2 and 4 (agriculture and industrial/commercial). GBEP can serve two major functions. First, it can be a clearing-house for information on relevant programs and techniques. Second, it can facilitate negotiations and agreements between the private sector and regulatory agencies, resulting in creative solutions to compliance issues that also result in improved watershed functions. Private sector partnerships may result in restoration and enhancement of flood-prone private lands. This can also be a means to secure preservation of specific tracts of land quickly and with great cost effectiveness.

   Private sector partnerships could also help motivate developers to incorporate conservation development principles in their projects.

3. Government Agency Partnerships: Government agency partnerships are valuable to all five strategies through funding, regulatory interpretation/implementation, and public land preservation. These have been fundamental to the GBEP since its inception.

We recommend three specific areas of government partnerships for the West Bay region. The first is with the federal US Fish and Wildlife Service and the State Texas Parks and Wildlife Dept. The new Farm Bill continues the previous bill's commitment to provide funds for watershed protection. The Texas Cooperative Extension Service provides technical assistance to farmers and maintains a good rapport with the agricultural community.

The second government partnership we recommend is with the parks/recreation departments of the counties and cities of the West Bay area. These departments maintain open space for a variety of uses, some of which are compatible with watershed functions. An emphasis on watershed functions can provide an additional focus of programmatic activity in the parks, as well as the potential for additional funding.

The third governmental partnership we recommend is with Brazoria and Galveston Counties to work toward a vision and means to implement conservation development. Texas counties have very little power to regulate development, and generally do not want that power because it is so reactive. However, as low density sprawl continues, counties have increasing difficulties and expense in ensuring health and safety. Such development is a major threat to the surface hydrology of the region and thereby is a threat to the Bay. Thus, a win-win solution is possible if the counties recognize the benefits of conservation development principles and implement those in a variety of ways.

4. Public Education: Public education is also a traditional GBEP function which applies to all five of the strategies. However, its focus can be shifted to the West Bay region and to a variety of audiences that are specifically relevant to that region and that have not been a particular target audience in the past.

   The shift to the West Bay region can broaden the educational content into topics of freshwater, riparian, and prairie ecosystems how they relate to the Bay. These topics can be tailored to meet the interests of farmers, suburban landowners, and people who use these habitats for various sports.

   Public education can also help provide a vision for conservation-based development rather than low density sprawl.

5. Nature-based Tourism: Galveston Bay and its contributing watersheds offer a wide variety of tourism activities that draw on the qualities of the region, ranging from hunting and fishing to kayak-based art classes. These activities can help the GBEP to accomplish its goals by (1) creating an economic value for high quality environmental experiences, and (2) educating participants. The GBEP can facilitate nature-based tourism by providing interpretive information to existing tourism enterprises that will help visitors understand the integrated character of the Bay and the surrounding lands. Secondly, the GBEP can help create new nature tourism enterprises in the West Bay region by providing useful interpretive information, facilitating access, and providing technical assistance.

The first three of these implementation processes can help accomplish the short-term goal of conserving one or more specific parcels of land. All five of the processes can help implement a conservation ethic at the regional landscape level, as is essential to have a significant and lasting effect on Galveston Bay.

West Bay Habitat Conservation Initiative Advisory Team

Workshop Agenda

October 18, 2007

Workshop to be held at Galveston County Department of Parks and Senior Services headquarters, located at Carbide Park, 4102 Main (FM 519), LaMarque, Texas.

9:00 Welcome and Introductions

9:15 Overview of West Bay Conservation Initiative-Helen Drummond and Jeff DallaRosa

9:30 Halls/Chocolate Bayou Watersheds Habitat Inventory and GIS Data Assessment – Drs. Warren Pulich and Pam Showalter

10:15 Break

10:30 Advisory Committee Member Reports. Each attendee will have up to 10 minutes to present information on their specific conservation program or initiatives. PowerPoint presentations are welcome-facilitated by Dr. Warren Pulich and Jeff DallaRosa

12:00 Lunch

12:45 Draft West Bay Watershed Conservation Plan presentation and discussion of Implementation Strategies-facilitated by Helen Drummond and Dr. Jim Kimmel

2:15 Break

2:30 Implementation action items and moving forward-Dr. Warren Pulich and Jeff DallaRosa

3:00 Adjourn

List of Workshop Attendees

Helen Drummond – GBEP Director
Jeff DallaRosa – GBEP Project manager
Dr. Warren Pulich Jr.
Dr. James Kimmel = TSU, Geography Dept
Eddie Seidensticker = USDA-NRCS
John Huffman = USFWS
Mike Lange = USFWS
Tom Smith = USFWS
Woody Woodrow = TPWD
Jamie Schubert = TPWD
Stephen Johnston -- GBEP

Kathryn Nichols = Natl Park Service
Bob Stokes -- GBF
Dennis Harris – Galveston County Parks & Recreation
Mark Hanson – Brazoria County Parks & Recreation
Brian Caine = TSWCB
Texas Nature Conservancy – John Herron and Mark Dumesnil
Linda Shead & Hollie Swick -- Trust for Public Lands
Jennifer Lorenz – Legacy Land Trust

Phase 3: Conservation Projects Implementation

Implementation work on the West Bay Watershed project occurred over the period from early June 2008 to August 2009. Because the program shifted from research and planning into on-the-ground implementation, tasks focused on designing approaches for contacting and forming partnerships with watershed landowners for actual land conservation projects. Using GIS land use information developed in the earlier phase of the project, and recommendations from the advisory group members at the Oct. 2007 Workshop, an implementation strategy was developed based on principles of land stewardship and heritage preservation. Receptive landowners of key land parcels were identified and potential partnerships were explored by the GBEP-led coalition with the objectives of acquisition or conservation easements for target properties. The Texas State University team availed itself of the expertise of a former resident of the West Bay watershed area, Fred "Corky" Palmer, a land acquisition planning specialist who had previously worked for Texas Parks & Wildlife Dept. in this capacity, and who has extensive experience in land acquisition and familiarity with landowners and county officials in the study area (particularly Brazoria County). for the purposes of locating appropriate landowners of properties identified in the West Bay watershed area and arranging for site visits and field assessments of their properties.

Phase 3: Landowner Coordination Activities in Chocolate and Halls Bayou Study Area

As the project moved into the implementation phase, the team recognized the need for skilled assistance with discretely contacting landowners in the West Bay watershed area and arranging for site visits and field assessments of their properties. Consequently, Mr. C. Palmer, was very effective in making contacts with 2 key landowners in the region. Several meetings were held with Brazoria County stakeholders, and one landowners during September, to coordinate meetings and arrange actual site visits in the Halls Bayou regions. Mr. Andrew Sansom of the River Systems Institute (and former Director of Texas Parks and Wildlife Dept) was quite active in this phase of the project. Mr. Sansom initiated coordination with two State land acquisition programs operated through Texas General Land Office (Coastal Impact Assistance Program and the Texas Farm and Ranch Lands Conservation Program). There is significant potential for the latter to be a source of matching funds for the GBEP Initiative, and Mr. Scott Campbell of TFRLCP-GLO is now actively working with the GBEP team.

A negotiation team was formed with several advisory group members (coordinated by the Texas State University/GBEP team) for the purposes of contacting landowners in the West Bay watershed area and arranging for site visits and field assessments of their properties. Key team members from TPWD, USFWS (including both Brazoria National Wildlife Refuge and Clear Lake Ecological Services personnel), and TGLO have agreed that a partnership formed between their organizations could accomplish common agency land conservation goals and objectives in the Chocolate and Halls Bayous regions. Moreover their interests and experience in land acquisition and familiarity with landowners and county officials in the study area (particularly Brazoria County) could enhance the pursuit of key land parcels for acquisition or conservation easements if coordinated by the GBEP-led coalition... The designated team of resource agency partners will work together in the future on negotiating potential conservation project sites in the West Bay watershed.

Phase 3: On-ground land conservation projects

Positive landowner response over the fall months showed that several landowners in the Chocolate and Halls Bayous watersheds appeared interested in the program. From extensive research material obtained by C. Palmer on land ownership of individual tracts in Brazoria County, one promising property with native coastal prairie habitat was chosen. A site visit to the Hlavinka Farm along lower Halls Bayou south of Highway 2004 was conducted with Kenneth Hlavinka, farm co-owner, on October 9, 2008, approx. one month after Hurricane Ike hit this part of the Texas coast. Despite some Hurricane damage, we were able to drive around and survey some of the approx. 7,973 acres of this farm holding, known as Tres Bayous Farms on the tax roles. This site was deemed to have considerable potential for follow-up negotiations.

The team decided to focus its concerted effort on negotiating with the Hlavinka family of East Bernard for its Tres Bayous Farms property, a very significant piece of farmland and native habitat property near lower Halls Bayou owned by the Hlavinka family. On Dec.8, 2008, another joint survey trip was made with TPWD, USFWS, and GBEP personnel to the 7,900 acres of Tres Bayous Farms along Halls Bayou below Highway 2004. Agency personnel expressed a very favorable reaction to obtaining a conservation easement if possible on some critical portions of the 7,900 acre site, including coastal wetlands and 'pothole' prairie habitats. Further description of this property will be presented in next quarter's progress report.

Phase 2 Public Outreach Activities

W. Pulich attended the Biennial State of the Bay Symposium in Galveston sponsored by the Galveston Bay Estuary Program in January 2009. He made a presentation on the West Bay Watershed Conservation Project, in a session devoted to Best Management Practices in watersheds that contribute to water quality protection. The emphasis was on showing how conservation easements and habitat/land preservation are often the most economical, long-lasting and effective methods for protecting and maintaining water quality and riparian and in-stream aquatic systems.

Phase 2 Funding Proposal Preparation

After attending the TX State stakeholder CWPPRA coordination meeting in March 2009, Texas Farm and Ranch Lands Conservation Program (TFRLCP) director Scott Campbell agreed to partner with the GBEP Watershed and Land Conservation Program and submit a joint CWPPRA proposal. As a result, W. Pulich prepared the attached material for the program describing the Hlavinka property. Funding for approx. $1 million would be requested to acquire a USFWS conservation easement on the property through CWPPRA. If possible, matching GBEP program funding on the same property would be sought from the State of Texas CIAP (Coastal Impact Assistance Program).

Mr. Andrew Sansom of the River Systems Institute continued actively coordinating with two State land acquisition programs operated through Texas General Land Office (Coastal Impact Assistance Program and the Texas Farm and Ranch Lands Conservation Program). These activities have led to widespread dissemination of information on the GBEP Watershed and Land Conservation Program. As a result, TFRLCP coordinator Scott Campbell is interested in working to acquire funding through his GLO program, if possible, for matching GBEP program funding on property such as the Hlavinka Farm.

CWPPRA GRANT PROJECT STATEMENT
TRES BAYOUS FARMS, BRAZORIA COUNTY, TEXAS

prepared for USFWS & TFRLCP
June -- Oct 2009
by Warren Pulich Jr.
River Systems Institute, Texas State University – San Marcos

Project Location, Need, and Objectives

The Tres Bayous Farms (7,973 acres of land owned by the Hlavinka family from East Bernard) is located along Halls Bayou, south of Highway 2004, in Brazoria County near West Galveston Bay (Fig. 1). Half of these parcels border on the westside of Halls Bayou, and the other parcels extend westward, across Persimmon Bayou, to New Bayou. As shown in Fig. 2, 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 grasslands are maintained primarily for cattle grazing and bird hunting.

A phased land conservation approach is proposed to acquire a portion of the Tres Bayous Farms under a CWPPRA project grant. Preliminary analysis has identified nine land parcels (4,501 acres total) of the Tres Bayous area (Fig. 2) 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 Figs.2 & 3) comprise 2,743 acres of coastal prairie – pothole habitat, 1,304 acres of cultivated land, 331 acres of pasturelands, and 123 acres of riparian habitat along both Halls and Persimmon Bayous. These nine parcels (4,501 acres total) are recommended for a CWPPRA grant under the initial phase of conservation activities.

Increasing wetland loss, nutrient/ pollutant loadings, and native habitat fragmentation are occurring within the West Bay watershed, as rural Galveston and Brazoria Counties are developing rapidly, with populations expected to increase about 40 % by 2025. Much of this development will likely be concentrated along freshwater bayous, like Halls and New, unless land conservation mechanisms are applied to protect the existing farms and ranches with their native grasslands and riparian areas. The 'pothole prairie' habitat represents an ecologically unique, and scarce, coastal prairie habitat with depressional wetlands, transitional between true uplands and estuarine marshes, and is mostly unusable for farming purposes. In addition, 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. This makes it most inappropriate for residential development.

Expected Ecological and Public Benefits

The area is considered to have high watershed protection, native terrestrial habitats, and freshwater wetlands values. As mentioned above, it harbors scarce native coastal 'pothole prairie', some brushlands, and riparian habitats, all within 10 mi of West Galveston Bay. These native habitats and ranchlands act as buffers from encroaching urban development to the north. Runoff from either rural septic systems or agriculture operations is buffered by rice field levees and

riparian vegetation. Halls Bayou provides a recreational waterway of high aesthetic value for canoeing/kayaking and nature enthusiasts. The terrestrial habitat serves a variety of coastal wildlife and game species. Protection 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.

Wetlands Conservation. As mentioned previously, approx. 250 acres of freshwater wetlands are found on the property, within the "pothole prairie" category, and 125 acres of estuarine riparian wetlands occur along the bayous. Estuarine wetlands are dominated by bulrushes, cordgrass, needlerush, sedges, and various succulents. Upland wetlands have spikerush, smartweed, and various grasses and sedges, as dominants, and very few cattails or Chinese tallow are present. The native areas are used by typical wetland birds and wildlife found in this part of the upper Texas coastal zone, both estuarine and freshwater species.

Long-term Conservation. The project is planned to provide for a permanent conservation easement on the 4,000 acres of property under the CWPPRA program. This will ensure the wetlands and grassland habitat functions of the "pothole prairie"region, as well as the riparian areas along the bayous (in perpetuity?) .

Coastal Watershed Management. Currently there is not an existing watershed management plan for Halls and New Bayous. This project would represent an initial start for such a plan since it would protect much of New Bayou and a large part of lower Halls from runoff, by preserving grassland and riparian buffers around them. These bayous in turn are considered essential to protecting water quality of inflows to West Bay.

The project also represents a first implementation phase of the West Galveston Bay Watershed Conservation Initiative which is sponsored by the Galveston Bay Estuary Program (GBEP). This program (discussed below) was designed as a collaboration between various resource management and conservation stakeholders in the region to preserve native wetlands and vegetated upland habitats that in turn can protect and maintain water quality of Galveston Bay .

Threatened or Endangered Species Conservation. There are significant grassland plant species found in the 'pothole prairie" habitat. A variety of scarce plant species (especially prairie grasses) can be found here. Some bird species such as Bald Eagle and Peregrine Falcon also occur in season regularly on the property. Some State-listed species, such as Reddish Egrets and White-f. Ibis, and mammals/others may benefit from this land

Benefits to Fish. The protection of water quality in New and Halls Bayous is essential to providing clean and productive aquatic habitat for fish and wildlife. By protecting these important bayou drainages into West Bay, estuarine fisheries species would be afforded critical, high-quality, nursery habitat and low-salinity refuge areas.

Benefits to Coastal-dependent or Migratory Birds. Brush thickets and riparian corridors on the property offer suitable 'stop-over' places for migrating passerines. Some coastal waterbird species are found regularly along the bayous and in wetland ponds and swales, especially when the latter contain open water.

Reduced Contamination. Responsible farming and ranching practices carried out on the Tres Bayous Farm will continue to maintain a high quality environment in the region. An important aspect of continuing these farming and ranching operations would be prevention of non-point source loadings which eventually occur from residential and industrial development when urbanization replaces such rural land use.

Partners in Conservation. Cooperators in the West Bay area

Federal share reduced -- Negotiate?

Education/Outreach, and wildlife-oriented recreation. Get from Jeff , although game bird and waterfowl hunting is a major recreational activity.

Other Factors: Cultural heritage?

Implementation of Conservation Project

Procedures and activities schedule. Although the entire Tres Bayous land area (Fig 2), consisting of some 7,973 total acres, should be under easement, a phased conservation approach is proposed for CWPPRA. A preliminary analysis has identified nine land parcels as high priority based on ecological services provided (e.g. providing critical or scarce coastal habitats, for protection of water quality in the bayous, and buffering from encroaching development). The southern 9 parcels identified as # 1 through 9 in Fig. 3, comprise 2,743 acres of coastal prairie – pothole habitat, 1,304 acres of cultivated land, 331 acres of pasturelands, and 123 acres of riparian habitat along both Halls and Persimmon Bayous. These nine parcels (4,501 acres total) are recommended for a CWPPRA grant under the initial phase of conservation activities. There would appear to be the potential to achieve some match for the CWPPRA project through donation of easements on some of the prairie and riparian areas.

The time table for implementing the easement is dependent on several factors that remain to be negotiated.

Key Personnel and Partners. This project would be submitted to CWPPRA by The Texas Farm and Ranch Lands Conservation Program (TFRLCP) under auspices of the Texas General Land Office. The TFRLCP is charged by the Texas Legislature to facilitate the purchase of agricultural conservation easements to protect agricultural and ranch land from development.

The Galveston Bay Estuary Program (GBEP) of TCEQ has been sponsoring the West Galveston Bay Watershed Conservation Initiative focused on the Halls and Chocolate Bayous region. GBEP is working in close association with Texas State University – San Marcos, River Systems Institute (TSU-RSI), which has provided technical and conservation planning assistance. As part of the GBEP Conservation Initiative, a watershed advisory group (USFWS, TPWD, NRCS, TCEQ, TPL, H-GAC, GBF, TNC,) was formed to facilitate stakeholder participation. There are several entities with real estate transactional expertise involved (e.g. Nature Conservancy). Thus, there is a well-organized support group in place to develop this project and work with the TGLO Farm and Ranch Land Conservation Program; and this would bring additional land conservation mechanisms to bear on the project.

Estimated Costs ?? -

Public and Interagency Coordination -

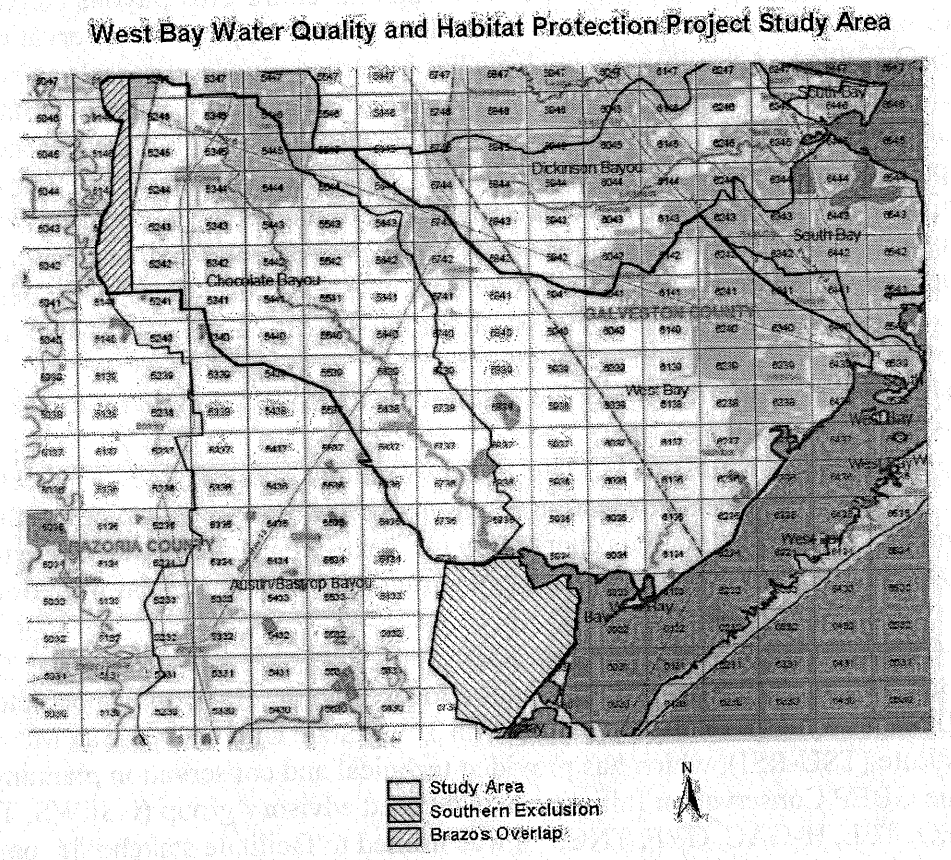
Representative and Senatorial Districts

State: House District 25 – **Rep. Dennis Bonnen**
State: Senate Districts: **Mike Jackson and Joan Huffman**
Federal: House District 25
Federal: Senate District

FIGURES

Fig. 1. West Galveston Bay subwatersheds of Chocolate Bayou and Halls Bayou. White line is the CMP boundary established by TX Coastal Coordination Council. The line overlays FM 2004, except where it runs north around Chocolate Bayou. See Fig 2 enlargement for location of Tres Bayous Farms near FM 2004 and Halls Bayou.

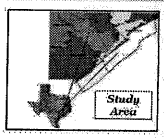
Figure 1. The Study Area



LANDSCAPE ANALYSIS APPROACH TO WATERSHED HABITAT CONSERVATION IN HALLS AND CHOCOLATE BAYOUS, TEXAS

Warren Pulich, Jr., River Systems Institute, Texas State University-San Marcos (TSU-SM)
Pamela S. Showalter, Director, James and Marilyn Lovell Center for Environmental Geography & Hazards Research, Department of Geography, TSU-SM
The authors also gratefully acknowledge the work contributed to this project by Corrie Colvin, MAG 2007. Funding for this research has been provided by the Galveston Bay Estuary Program Pulich © 2009

This work is part of a habitat conservation program study focusing on critical native riparian and upland woodland and coastal prairie habitats in Halls and Chocolate Bayous adjacent to West Galveston Bay. The Land Use/Land Cover (LU/LC) analysis is part of the long-range goal to develop a comprehensive watershed management plan for these two West Bay watersheds spanning Galveston and Brazoria Counties.



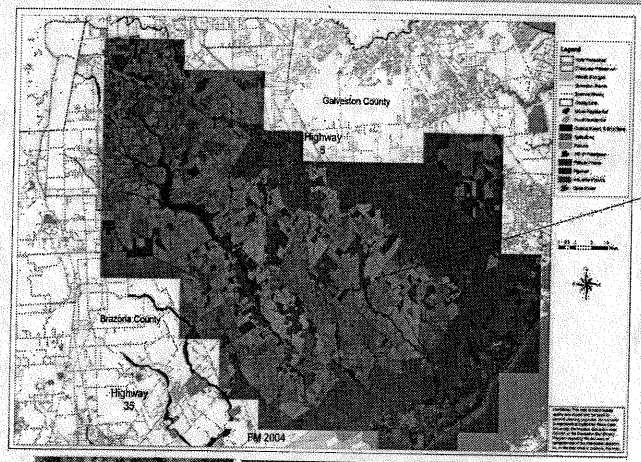
Landscape analysis project objective: Identify Priority Natural Area Sites for Conservation
Steps: 1) define habitat criteria and water quality constraints, 2) use a GIS Landscape Mapping approach, 3) develop datasets and weight variables, 4) apply appropriate spatial analysis tools, 5) implement findings to improve habitat conservation and water quality.

Water Quality Protection Criteria:

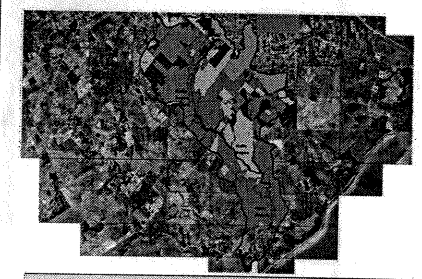
1) Riparian Zones: 50-100 foot riparian wetland buffers reduce erosion, filter sediments & nutrients, and maintain water quality;

2) Coastal Woodland/ Brushland: Woodlands and native pastures provide terrestrial species habitat, watershed-wide protection against flooding & improves water quality;

3) Proximity to preserves, refuges, parks or other conserved and/or protected areas.



Example of Riparian Zone Woodlands (top) and 100-foot, yellow buffer overlaid on riparian zone habitat (left)



Example of mapped LU/LC classes for Halls Bayou (Table 1)

Area where Riparian Buffer has been removed

Area where Riparian Zone is impacted by development

Parcel data overlaid on aerial photos (above), land use classes (below)

Table 1. Acres of LU/LC Classes in SubWatersheds

Land Use/ Land Cover	Halls Bayou	%	Chocolate Bayou	%
Agriculture	12,396	41%	24,060	30%
Pasture	6,148	21%	26,751	33%
Rural Residential	900	3%	10,434	13%
Heavy Urban Development	2,980	10%	1,425	2%
Industry or Water Use	0	0%	1,994	2%
Coastal woodland & brushland	2,627	9%	8,991	11%
Riparian shrub or woodland	1,370	5%	4,566	6%
Public Parks	4,126	14%	510	0.6%
TOTAL	30,125	100%	79,931	100%

Major LU/LC factors that impact native habitats' function to maintain water quality:

1) Proximity to roads or industrial areas,

2) "Threshold Effects" caused by impervious cover (currently impacting approximately 15% of the study area),

3) FEMA floodzone (legal restrictions),

4) Parcel size/ownership, and

5) Clearing of riparian zone buffer vegetation.

This research has been, and is being supported by the entities whose logos appear, below:

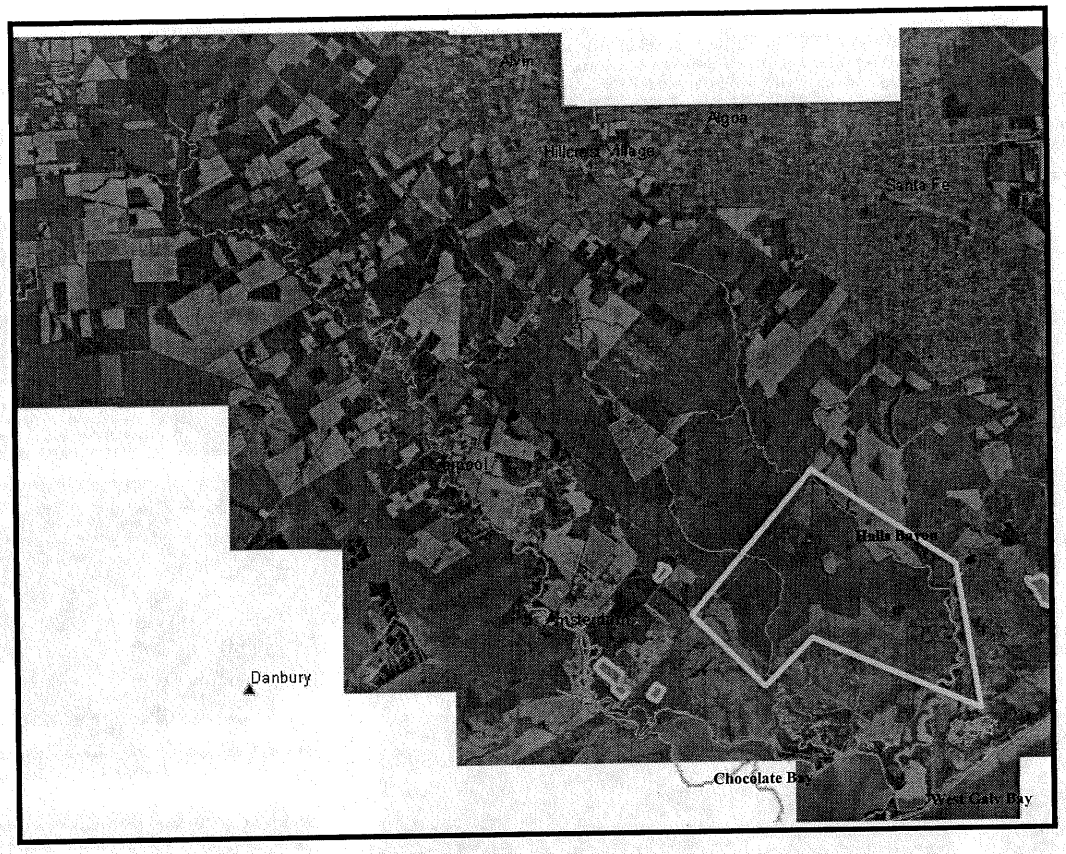


Figure 1. General location of Tres Bayous Farm (yellow outline), along Halls Bayou, near Chocolate and West Galveston Bays.

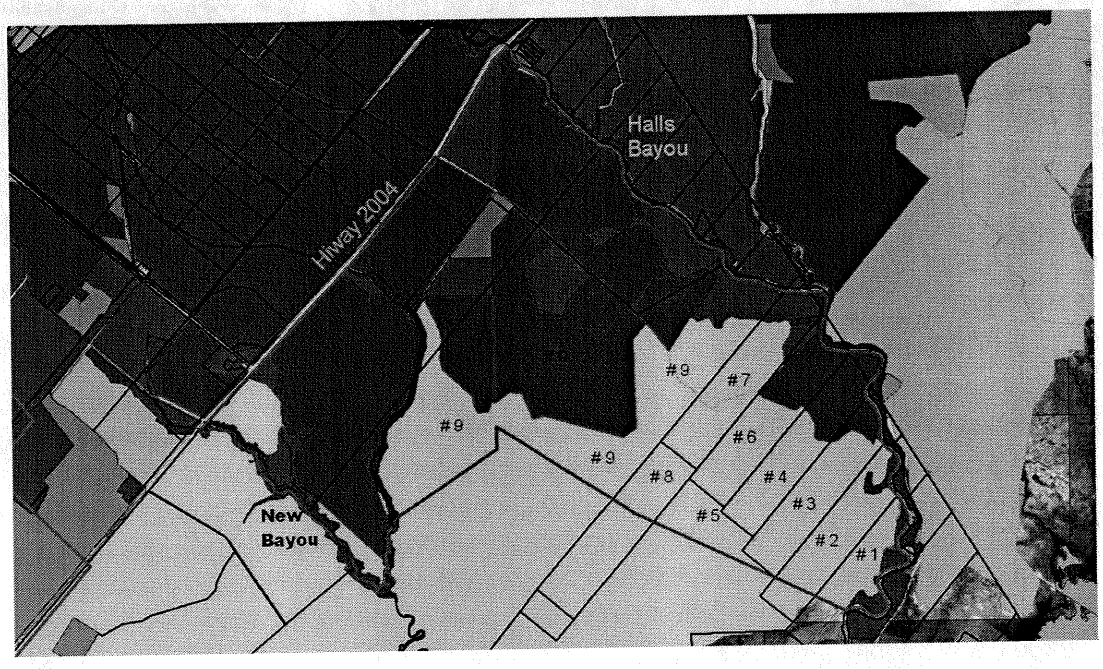


Figure 3. Tres Bayous Farm, showing land use/land cover. Green is agriculture, purple is pastures, tan is pothole prairie, and blue is riparian. Nine parcels proposed

for CWPRA easement are shown numbered.

Figure 2. Tres Bayous Farm, (red outline)