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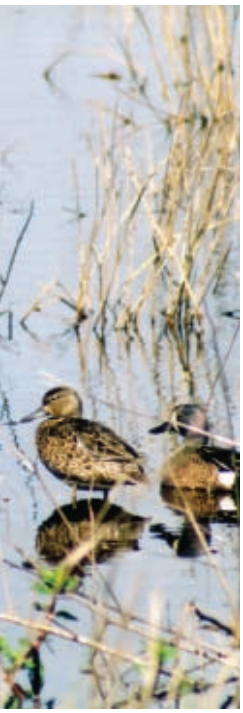
Chambers County
Greenprint for Growth and Conservation



The Trust *for* Public Land

CONSERVING LAND FOR PEOPLE

Cover photo (left) by Amy Turner
Cover photo (right) by Waterborne Education Center

Chambers County

Greenprint for Growth and Conservation

A report by
The trust for Public Land

June 2009

the Trust *for* Public Land

CONSERVING LAND FOR PEOPLE

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Chambers County

Greenprint Coordinating Committee

Greenprint Technical Advisory Committee

Greenprint Strategy Exchange Team

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Anahuac Area Chamber of Commerce

Anahuac National Wildlife Refuge

Bayer

Chambers County

NRG Energy

Oak Island Lodge

Rice Festival and Gator Fest

Speer Properties

Spoonbill RV Park and Lodge

Turtle Bayou Landing

U.S. Army Corps of Engineers Wallisville Project

Waterborne Education Center

West Chambers County Chamber of Commerce

Winnie Chamber of Commerce

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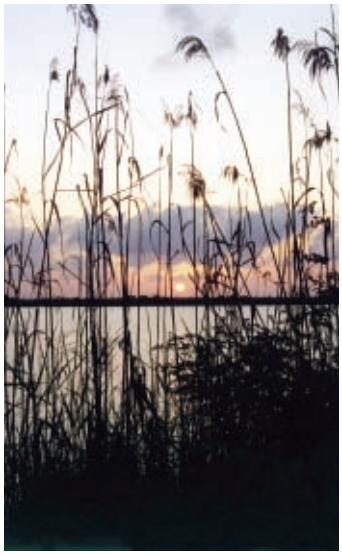
Executive summary



Amy Turner

"Greenprint for Growth®" is The Trust for Public Land's term for a strategy to manage growth, one that ensures quality of life, recreation, clean air and water, and economic health. For Chambers County, new opportunities open up for jobs, income, housing, and improved infrastructure as development and economic growth march steadily east from Harris County. Yet these same opportunities, without planning for growth, could result in a collision with the quality of life for county residents. Growth planning with land conservation will enable the county to maintain its rural character and natural assets.

The Trust for Public Land (TPL) facilitated a greenprinting project in Chambers County from 2007 to 2009. The Chambers County Greenprint was accomplished in three main steps, with stakeholder involvement critical throughout the process.

The primary goal of the Greenprint is to facilitate practical land conservation in Chambers County. Land conservation is a tool that allows for protection of lands valued by county residents, through the participation of willing landowners, willing buyers, organizations, and government entities. The greenprinting process brings many voices to the conversation, employs the best technology available, and takes steps to ensure that implementation is both efficient and effective.

The purpose of the first step in the process was to marry the science of data on county natural resources with the conservation goals of the community. TPL conducted interviews with county leaders, prepared a Current Conditions Report, conducted investigations and prepared a Land Conservation Funding Options Report, and established local committees to help guide the process.

Through a series of public meetings, stakeholders identified goals, adopted an outline of the Greenprint model, and assigned weights to each goal. The local committees helped collect and organize supporting data, define and refine the model criteria, and ensure that citizen goals were appropriately incorporated into the Greenprint models and results. TPL's technical staff translated the goals and data into a GIS (Geographic Information Systems) model.

The outcome of this first step was a set of maps showing locations where land conservation would best accomplish community goals. During the course of the discussions, stakeholders recognized that achieving the top three conservation priorities would also accomplish the next three, and this is reflected in the final weightings:

Preserve Natural Habitat	38%
Protect Water Quality	28%
Target Restorable Habitats	20%
Maintain Rural Character	8%
Protect and Restore Natural Drainage	5%
Create More Public Access for Nature-Based Recreation	2%

During the second step, a team of six professionals, the "Exchange Team," participated in a one-week Strategy Exchange with local experts, from May 12-15, 2008. After tours and roundtable discussions with local stakeholders, they presented a set of recommendations to address four questions related to implementation of the Greenprint, questions that had arisen over the course of the project.

Hurricane Ike intervened between Step 2 and Step 3 of the Chambers County Greenprint project. Post-Ike, the local committee reviewed the previous results, and determined that the Ike experience had not changed Greenprint goals, but, in fact, had only reinforced their importance.

Through the involvement of a combined local committee and a final stakeholder meeting, Step 3 carried the Greenprint process to its planning conclusion: development of a list of 39 recommendations in seven categories, and then a set of action items. Several of the 39 recommendations overlap with those of the Long-Term Community Recovery planning process conducted by FEMA, further cementing the community consensus for implementation of these projects. Stakeholders developed a "Top Ten" list of actions that they recognized as most critical for immediate attention to accomplish Greenprint goals.

What is a "Greenprint for Growth®?"

"The Greenprint is a 'roadmap' for Chambers County's future, one that will help us save what's best in the county, while we also build and grow as a community."

—Jimmy Sylvia, Chambers County Judge

Ruth Millsaps

"Greenprint for Growth®" is The Trust for Public Land's term for a strategy to manage growth, one that ensures quality of life, recreation, clean air and water, and economic health. A vision for future growth and a plan to protect important natural resources—that is what greenprinting is all about. Ultimately, greenprinting involves defining a conservation vision, securing the conservation funding, and acquiring and managing conservation lands.

The Trust for Public Land utilizes a pioneering and award-winning Geographic Information Systems ("GIS") process with state-of-the-art technology and combines it with community-based goals to identify those areas that get the "most bang for the conservation buck." The process begins, and is sustained throughout, with stakeholder involvement.

Goals may incorporate a broad range of objectives from "critters" to "parks for people." Then, land conservation scenarios are created with GIS software and The Trust for Public Land's extensive library of model templates, data archives, and unique custom tools for parcel analysis. The result is a set of maps that capture the land conservation goals in a visual representation.

The process continues with: (a) researching funding sources; (b) conducting a "Strategy Exchange Week" to bring together local and outside experts who investigate key challenges and offer solutions that would further accomplishment of community goals; and (c) developing an implementation plan with specific action steps.

What a greenprint IS:

- A map of land conservation
- Community-based goals
- Identification of opportunities to meet multiple goals
- Proposed market-based conservation

What a greenprint IS NOT:

- Not a map of land-use prohibitions
- Not determined by one or a few perspectives
- Not limited to protecting critters
- Not for condemning or taking land

Why a Greenprint for Chambers County?

"The Greenprint takes into account our history, heritage and natural resources, and gives local elected officials a guide to what is important to save as we grow. Greenprint and the ChaRT plan complement each other in the long-term outlook for Chambers County."

– Guy Robert Jackson, Mayor, City of Anahuac

Bobby Hall

Chambers County is facing enormous changes. As development and economic growth march steadily east from Harris County to Chambers County, new opportunities open up for jobs, income, housing, and improved infrastructure. Even in the aftermath of Hurricane Ike, these same growth opportunities could result in a collision between commerce and quality of life.

Yet, such a collision need not occur. Communities that plan for growth have an advantage. In most cases, they are better prepared to make informed decisions about their future.

The benefits of being pro-active for growth planning abound:

- *Steering growth around key resources.* The community can look at its natural resources and develop a strategy that marries development and conservation, instead of waiting until the County is behind the curve in addressing the expanding recreational needs of a growing population.
- *Focusing locations for infrastructure.* Green space attracts homebuyers, and investing in green space can simultaneously save money by minimizing far-flung public roads and utilities.
- *Protecting the environment that attracts tourists.* Protecting green space will also protect the water quality, air quality, and wildlife habitat that contribute to a healthier human environment for residents.
- *Protecting floodplains as a cost-effective alternative.* Flood control projects, flood insurance, and disaster relief are expensive.
- *Preserving the community's unique local heritage.* Many of Chambers County's green spaces are part of its cultural heritage of ranching and rice farming. Conserving some of the county's land maintains the relationship between its people and the land and water where they live and work.

Chambers County residents recognize that change is inevitable, that jobs and homes are needed, and that fiscal health and other county issues are critically important. Nonetheless, they also love Chambers County the way it has been. It is clear that citizens want to embrace the best of change and sustain the best of what they have.

Planning and implementing strategies to conserve green space on a local level, for multiple benefits, is the goal, then, of the conservation visioning process known as "greenprinting for growth and conservation." If the Chambers County conservation vision process is successful, development will still occur, but not on all the most important lands for the community's most cherished conservation purposes.

If successful, local and outside investments will enable fair compensation for Chambers County landowners who seek to conserve their land, and will enrich the lives of future generations of Chambers County residents, far beyond the monetary value of the investments made.

The tool of Land Conservation

The primary goal of the Greenprint is to facilitate practical, voluntary land conservation in Chambers County—bringing many voices into the conversation, employing the best technology available, and taking steps to ensure that implementation is both efficient and effective.

Bobby Hall

Ruth Millsaps

Land conservation is both the notion of protecting a piece of the earth for certain purposes and not other purposes, and the set of real estate, legal, and financial tools designed to make that notion a tangible reality.

Land conservation differs from other land use tools such as regulations or incentives, which are subject to frequent change based on the politics, policy, and science of the day. Both are important, and often are complementary.

As a general rule, land conservation has broader support because it is achieved through the mutual agreement of willing landowners and willing buyers of easements or land, and has perpetual benefits to the public. Often, a fair price for value foregone is a critical element to successful land conservation, and sources of funding to provide such compensation are a necessary condition for success.

Land conservation provides many opportunities for considering community needs and desires, because it can be applied to farmland, prairie, coastal natural resources, parks, habitat, and more.

It can be said of Chambers County that there is so much important land that one would have difficulty finding an undeveloped parcel that is not worthy of conservation. Indeed, this assertion is very nearly borne out because of the rich resources found here, but neither the money nor the will exists to protect every such parcel in the county, and it is clear that many unprotected parcels will be developed.

The primary goal of the Greenprint is to facilitate practical, voluntary land conservation in Chambers County—bringing many voices into the conversation, employing the best technology available, and taking steps to ensure that implementation is both efficient and effective.

The Greenprinting Process and Stakeholder Involvement

"As an elected official of a small city and site development consultant for a local industrial park, I witnessed a convergence of the latest techniques and technologies, resulting in a visual display of constituent values affixed to the very property we walk upon. The Greenprint is not only a 'road map' for the future of Chambers County, but also a dynamic challenge to our creativity and fortitude—one that must be met!"

– Hon. Guido Persiani, Mayor, Beach City

Bobby Hall

From 2007 to 2009, The Trust for Public Land (TPL) facilitated the greenprinting project to protect valuable natural resources in the Galveston Bay community of Chambers County. The Texas Coastal Management Program engaged TPL to conduct the Greenprint, in order to demonstrate the effectiveness of this process in achieving community-identified conservation goals for rural coastal counties, with an emphasis on coastal natural resource areas. The Galveston Bay Estuary Program provided supplemental funding.

The project was part of a program to assist communities in coastal counties with planning for the future welfare of their lands and waters. It utilizes TPL's greenprinting services, which marry science and community values using computer mapping and modeling. The program focuses on the use of land conservation to meet community needs that were identified through public and committee meetings of stakeholders. These needs ranged from water quality and habitat protection and restoration to maintaining rural character and increasing public access for nature-based recreation.

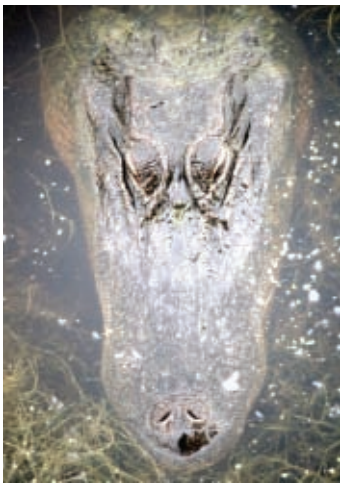
The Chambers County Greenprint was accomplished in three main steps, with stakeholder involvement critical throughout the process.

Step 1: Countywide Assessment and Prioritization

The purpose of this first step was to combine the science of data on county natural resources with the conservation goals of the community. To accomplish this goal, stakeholders identified and prioritized key issues in the county. Then, TPL's technical staff and local committees collected and analyzed existing data and developed new data as needed. Finally, technical staff used computer modeling to demonstrate where in the county the community's conservation goals could best be met.

To initiate the project, TPL conducted interviews with key county leaders, and prepared a Current Conditions Report to describe the existing landscape in terms of geography, demographics, and threats to natural resources. Additionally, TPL staff conducted investigations toward a Land Conservation Funding Options Report, which described both existing and potential opportunities for financing conservation.

On the stakeholder side, two local committees were established to help guide the process: a Coordinating Committee and a Technical Advisory Committee. Full community stakeholder meetings were also convened to solicit input on the goals, priorities, and recommendations of the Greenprint.


Bobby Hall

The Coordinating Committee was composed of representatives from local government entities, community organizations, federal agencies, and private interests. Most were residents of Chambers County. Their role was to serve as liaisons among the Technical Advisory Committee, County staff, the staff of TPL, and the community at large. Their tasks were to: (a) ensure that citizen goals were appropriately incorporated into the Greenprint model, (b) help plan and implement the Conservation Strategy Exchange, (c) develop final recommendations based on input from the Conservation Strategy Exchange and stakeholder meetings, and (d) review and critique Greenprint reports. Members of the Coordinating Committee are listed in Appendix 2.

The role of the Technical Advisory Committee was to define the goals and criteria of the Greenprint model in a manner that was consistent with accepted scientific data and principles. Their tasks were to: (a) identify data sources to support priority goals, (b) assist with data collection, (c) develop supplemental data, (d) define model criteria, (e) refine the model outline, and (f) review and critique model results. Members of the Technical Advisory Committee are also listed in Appendix 2, along with many others in the community and government who provided additional technical assistance.

At the public Kick-Off Meeting in March 2007, with more than 65 people in attendance, stakeholders created a long list of nearly 100 specific land conservation challenges, opportunities, and goals that the County is facing. The Coordinating Committee grouped these issues into six major categories, which were then translated into Greenprint goals. TPL staff worked with the local committees to choose goal definitions, data, and assumptions to build into a computer model for each of the many sub-criteria.

At an Analysis Meeting in August 2007, the full group of stakeholders met to adopt an outline of the Greenprint model and review data sources. Working with the local committees, TPL staff then completed the definitions, data collection, computer models and maps for each of the six goals.

At the Priorities Meeting in April 2008, stakeholders met to review and critique the draft maps that modeled the six conservation goals and to assign weights to each. Dr. William Seitz of Texas A&M University at Galveston assisted in the prioritization/weighting process with the utilization of a wireless electronic voting system that allowed stakeholder votes to be taken several times. Brenda Faber, a TPL GIS consultant, was present to immediately translate the votes and weighted goals into modeled results on maps. This process allowed stakeholders to view and discuss the results of the voting, and more easily arrive at consensus on the weightings. The resulting overall priorities map showed those areas within which land conservation would best help achieve the community's goals.

In between stakeholder meetings, the committees provided feedback and consolidated community and expert input.

Step 2: Strategy Exchange

During Step 2, a team of six professionals, the "Exchange Team," participated in a one-week Strategy Exchange with local experts and stakeholders in the county, from May 12-15, 2008. The Exchange Team's expertise enabled them to address a set of four implementation issue questions that arose during Step 1. The agenda for the Exchange Team illustrated the challenges affecting the area and the goals of the Greenprint. It involved both land and water tours and working sessions with key stakeholders, including members of the local committees. The Exchange Team's visit culminated in a presentation and a set of recommendations of potential strategies for protecting Chambers County's valuable resources.

Step 3: Implementation Planning

Step 3 carried the Greenprint process to its planning conclusion. Members of the two local committees merged into the Greenprint Committee to review and critique the reports (delayed by Hurricane Ike), and develop draft final recommendations and action items. The final Action Plan Meeting was held on May 28, 2009 to finalize recommendations and next steps toward implementation of the Greenprint. The Final Report will be presented to local entities, and partners will continue to work with the community in support of efforts to finance and implement conservation strategies for the county.

How Does The Greenprint Relate to the Long-Term Community Recovery Plan for Hurricane Ike?

Implementing the Greenprint is seen as a tool that could enhance the county's resilience in the face of future storms: protecting the land helps avoid damage to structures, and marsh areas serve as buffers that absorb floodwaters and storm surge.

Ruth Millsaps

While The Trust for Public Land and stakeholders were in the midst of the Greenprinting process—preparing to develop a final report and recommendations—Hurricane Ike struck the upper Texas coast on September 13, 2008, dealing a heavy blow to Chambers County. Completing the Greenprint was put on hold while county residents, businesses, and government entities tackled the daunting tasks of recovering from the substantial damage to homes and public infrastructure caused by the storm surge and winds generated by Hurricane Ike.

In the aftermath of the storm, and based on the extent of damages and the limit of county resources, Chambers County was identified as a good candidate for involvement from the Emergency Support Function (ESF) #14 for a Long-Term Community Recovery (LTCR) process. The Federal Emergency Management Agency (FEMA) leads the ESF-14 process, with participation by multiple federal agencies. It provides technical assistance and support to develop a local disaster recovery plan.

Like the Greenprint, the LTCR process is community-driven and reflects ideas and priorities expressed at public open houses and committee meetings. The Chambers County LTCR Plan resulted in 34 projects across five categories: Housing and Community Development; Community Facilities & Infrastructure; Economics and Industry; Education, Health and Human Services; and Environment and Coastal Areas Protection.

Although the LTCR categories are much broader than those of the Greenprint, Greenprint priorities are reflected in projects across four of the five LTCR categories, most notably in the following projects: Vision Planning County-Wide Planning, County-Wide Parks and Recreation Master Plan, AgLand Mapping and Reuse Assessment, Ecotourism Marketing and Outreach, Restoration and Preservation of Coastal Marsh, County-Wide Drainage Improvements, and Shore Protection and Beach Nourishment. In three of the projects, the LTCR Plan specifically states, "This study should also incorporate the results from the Chambers County Greenprint project—and to the extent feasible—should incorporate the accomplishments of that project."

Furthermore, implementing the Greenprint is seen as a tool that could enhance the county's resilience in the face of future storms: protecting the land helps avoid damage to structures, and marsh areas serve as buffers that absorb flood-waters and storm surge.

Ruth Millsaps

Chambers County's Current Conditions

"The focus of the Greenprint was to make it possible for Chambers County residents—both lifelong and recent transplants—to appreciate and enjoy the rural character and natural resources of home for years to come. We have so much more to offer than fast food chains and strip malls, and it is worth the effort to keep it that way."

– Amy Turner, Director, Waterborne Education Center

Amy Turner

Information about the setting for the Greenprint—Chambers County's landscape, people, economics, and natural resources—was originally collected in 2007-2008, prior to Hurricane Ike. The information has been updated where appropriate and where new information has become available.

Summary

The study area for the Chambers County Greenprint covers 403,000 acres (or approximately 630 square miles) of the County—the land area plus streams and lakes. Beyond, Chambers County also encompasses Trinity Bay and upper Galveston Bay, for another 155,000 acres of open water, though this area was not addressed in the Greenprint since it is managed by public agencies.

Habitat types of concern for conservation in Chambers County include: freshwater and saltwater marshes, flyway corridors for migratory birds, riparian (streambank) corridors, oak mottes, cypress swamps, and upland coastal prairies.

Currently conserved lands in Chambers County include County parks, privately managed preserves, national wildlife refuges, and the Wallisville Lake Project, for a total of approximately 57,100 acres.

The dominant change in land use occurring in Chambers County is the conversion of farm and ranch land to building sites for single-family homes. The trend toward exurban development, driven in part by increased mobility of people and jobs in the 21st century economy, is common throughout the Houston-Galveston region.

Hurricane Ike has wrought many changes in the county. Fortunately, most of the natural resources are already recovering from their damages. It will take a greater investment of time and funding to mitigate damages to economics and infrastructure. Changes in population have yet to be evaluated.

The Place

Founded in 1858, the history of Chambers County mirrors that of the State of Texas. Home to Native American tribes as early as 1000 A.D., it has experienced waves of Spanish, French, Mexican and Anglo influences and figured prominently in the war with Mexico for Texas Independence.[1] Today, it remains an important area ecologically and economically because of its abundant natural resources.

[1] Texas Handbook Online

Amy Turner

Location

Chambers County encompasses the land around the shoreline of Trinity Bay in the southeastern portion of Texas, within the Houston-Sugar Land-Baytown Metropolitan Area. The county is bordered by Harris County on the west, Jefferson County on the east, Liberty County on the north, and on the south by Galveston County plus one mile of Gulf beach. Its county seat is the City of Anahuac. In addition to Anahuac, the county includes the incorporated cities of Beach City, Cove, Mont Belvieu, and Old River-Winfree, and the communities of Double Bayou, Oak Island, Stowell, Wallisville, and Winnie. Additionally, portions of the City of Baytown lie within Chambers County, and the cities of Seabrook (in Harris County) and Texas City (in Galveston County) have jurisdiction over some parts of Galveston Bay that lie within Chambers County.

Size

Encompassing 872 square miles, more than 31 percent of the county's area is comprised of water (Trinity Bay and upper Galveston Bay). Both natural and man-made features divide the county into distinct personalities. The Trinity River bisects the county into East and West sections: The I-10 bridge crossing separates the more industrialized area, which has spread out from Houston, from the rural agricultural area that lies to the east.

Approximately 57,100 acres—about 14 percent of the study area of Chambers County—are managed for parks and conservation lands, including the Anahuac National Wildlife Refuge and the U.S. Army Corps of Engineers Wallisville Project Area. (See Table I.)

Protected Land	Acreage
Anahuac National Wildlife Refuge	33,999
Candy Cain Abshier Wildlife Management Area	212
Local Parks	732
Moody National Wildlife Refuge	3,516
Nonprofit Organization Sanctuaries	216
Wallisville Project	18,387
TOTAL Protected Areas	57,062

Table I: Protected Land

The 155,000 acres of submerged lands of the county within the bay system (not part of the Greenprint study area) are managed by public agencies. The Chambers-Liberty Counties Navigation District owns approximately 30,000 of these acres in tracts along the east shore of Trinity Bay, near the mouth of Cedar Bayou, and across the bay from Smith Point to San Leon. The Texas General Land Office manages the balance of the County's submerged lands.

Climate

Like much of the Gulf Coast, Chambers County experiences a humid, subtropical marine climate, with an average rainfall of 49 inches, and is subject to major storm events. The annual growing season lasts 261 days. The average temperature is 70 degrees, rising to the upper 90s during the summer months.[2]

Topography

Chambers County is part of the Texas Coastal Plain and is relatively broad and flat with elevations that range from sea level up to just 50 feet. The relatively flat land, combined with the potential for intense rainfall and/or storm surge from the adjacent bays and Gulf of Mexico, can create severe flooding problems—well demonstrated during Hurricane Ike and then again during the April 2009 rainfall events.

Geology

Consistent with the coastal plain system, which supports marshes and cypress forest habitat, soils in Chambers County tend toward coastal clay and sandy loam which drain slowly but provide ideal conditions for agriculture, pasture grazing, migratory birds, alligators and marine life.

Chambers County is also marked by salt domes—raised geological formations created by vertical columns of salt in the earth's strata that can indicate the presence of petroleum or natural gas. Barbers Hill and Lost Lake are two of the salt domes that drive the energy industry in this area.

[2] *Ibid.*

Wildlife and Habitat

Bobby Hall

Chamber County's wildlife habitat is integral to its economic and environmental health. Because of its rural character and federal lands, much of its natural habitat remains relatively intact, especially east of the Trinity River.

Uplands in the county—characterized by tall grasses, live oaks and pine—give way to cypress and cedar as the land slopes gently toward the coastal wetlands. These wetlands provide enormous benefits for holding and distributing water in storm and upstream flooding events. The mouth of the 550-mile-long Trinity River—which is surrounded by Corps of Engineers lands once planned for a large reservoir—spills into Trinity Bay, providing Galveston Bay with more than half its freshwater inflows.[3] Galveston Bay historically has been the leading fishery resource center in Texas, producing commercial white and brown shrimp, finfish, blue crab, and oysters, plus sport fishing.[4]

The Anahuac National Wildlife Refuge in the southeast portion of the county is home to more than 270 species of birds, important recreational fish species such as redfish and sea trout, and thousands of alligators.

This proximity to the coast and location within the migratory bird flyway led to inclusion of the Refuge on the Great Texas Coastal Birding Trail and other nature tourism venues. Visitors are likely to see as many as 27 species of ducks during the fall and winter. Huge groups of snow geese—sometimes in excess of 80,000—feed on rice fields and moist soil units, and may be viewed walking along East Bay Bayou in the Refuge.

During spring migration, visitors can view dowitchers, western sandpipers, black-necked stilts, and other shorebirds. Walking along the wooded banks of East Bay Bayou, visitors may see orioles, tanagers, warblers, and other songbirds. Table II shows recent trends in colonial nesting water bird species in the Galveston Bay system—popular with wildlife watchers.

American alligators, once endangered, have become an abundant resident of the refuge (though their numbers appear down after Ike). Muskrat, nutria, and bobcat are some of the common refuge furbearers. Raccoon, opossum, skunk, and river otter are found on the refuge, but are rarely seen during daylight hours.[6] Waterfowl hunting is permitted in designated areas on the refuge. From October 2006 through September 2007, there were 4,700 hunters and 65,000 total visitors to the refuge.

Hurricane Ike resulted in some habitat and wildlife losses/changes, but these are judged to be temporary:

- Marsh burnout due to saltwater inundation (expected to recover except where inundation becomes longer term—see below)
- Diminished alligator populations
- Movement of many waterbirds from the east county to the west (though expected to move around again)
- Stressed live oak trees and cypress trees (but leafing out in spring 2009)
- Lost black willow trees (but their fast-growing nature will allow rapid new growth)

Some habitat will not naturally recover, and will need structural intervention: The damage or destruction of approximately 30 saltwater gates on local drainages will allow more permanent saltwater inundation of fresh and brackish marshes. These gates were originally installed when the local drainages were dredged several decades ago. Without the gates, the dredged channels would have allowed saltwater to intrude on the originally fresh and brackish marshes.

Feeding Habitat	Nesting Habitat	Species	20 Year Trend (1987-2006)
Marsh	Tree	Black-crowned Night Heron	↓
		Great Blue Heron	↓
		Roseate Spoonbill	No trend
		Snowy Egret	No trend
		Tri-colored Heron	↓
		White Ibis	No trend
		White-Faced Ibis	↓
	Ground	Reddish Egret	↓
Open water		Black Skimmer	No trend
		Brown Pelican	↑
		Laughing Gull	↓
		Least Tern	No trend
		Neotropic Cormorant	↓
		Forster's Tern	No trend
		Royal Tern	No trend
		Sandwich Tern	No trend

Significant Decrease	↓
Moderate Decrease	↓
Moderate Increase	↑
Significant Increase	↑
No Trend	No trend

Photo: Texas Parks and Wildlife Department

Table II: Bird Trends [5]

[3] Galveston Bay Foundation. http://www.galvbay.org/advocacy_inflows.html

[4] Galveston Bay Estuary Program. The State of the Bay: A Characterization of the Galveston Bay Ecosystem, Second Edition. 2002. p. 51.

[5] Lester, L.J. and L.A. Gonzalez. 2008. Galveston Bay Status and Trends Final Report. Texas Commission on Environmental Quality, Galveston Bay Estuary Program. Houston, Texas.

[6] (http://www.fws.gov/refuges/profiles/recEdMore.cfm?ID=21521)

Ruth Millsaps

Water Supply and Water Quality

Chambers County enjoys relatively clean water that supports drinking sources and the commercial fishing industries.

The primary sources of drinking water for Chambers County include:

- Lake Anahuac for the City of Anahuac;
- The Lower Neches River and Trinity River for the eastern section of the county, whereby surface water is purchased from the Lower Neches River Authority & Trinity Bay Conservation District; and,
- The Coastal Water Authority (raw surface water) for the western portion of the county.

Other water suppliers (all from groundwater) include: Aqua Texas, Inc., Bay Area Water Authority, C&H Water Production, City of Baytown, City of Mont Belvieu, Coles Crossing Water System, Gray Utility Services, Inc., J&S Water Company, LLC, Kelly Well Service, Olsen Estates Water Supply System, The Bay Place Property Owners Assn, Inc, Timber Ridge Water Company, and Villa Utilities.

The Chambers-Liberty Counties Navigation District (CLCND) provides municipal raw water to the City of Anahuac and the Trinity Bay Conservation District.

In order to ensure a reliable source of fresh water, CLCND purchased Turtle Bay, which is now Lake Anahuac, from the State of Texas in 1953. The Lake comprises 5,000 acres, and CLCND is permitted to divert 35,300 acre-feet of water per year from its watershed. CLCND maintains a levee system surrounding the south, west and north sides of the Lake to prevent salt-water intrusion into the system. The Lake can receive water from the Turtle Bayou watershed, as well as by direct diversion from the Trinity River, by pumping if necessary.

In 1968, CLCND began supplying raw water for municipal purposes and now supplies the City of Anahuac Treatment Plant, as well as two different treatment facilities owned by the Trinity Bay Conservation District.

CLCND is also a partner with the City of Houston, Trinity River Authority, and U.S. Army Corps of Engineers for the Wallisville Saltwater Barrier that is constructed on the Trinity River two miles south of IH-10. This barrier was constructed to prevent saltwater intrusion upriver to the freshwater diversion points of CLCND and other entities that pump water from the river. The barrier is operated only during low river flow periods, which would allow saltwater to enter the river system from Trinity Bay. The barrier creates no impoundment beyond the natural surface of the river.[7]

Along with their significance for drinking water and agriculture, adequate freshwater inflows are also important for the fisheries of the bay system—especially oysters. Focused efforts to ensure adequate freshwater inflows to Trinity Bay, and all of Galveston Bay, have been ongoing since 1996, when the Galveston Bay Foundation and the City of Houston helped initiate the Galveston Bay Freshwater Inflows Group, with representatives from state agencies, water providers, and environmental interests. Chambers County has been well represented on that group, as well as in the subsequent state initiatives to address water supply and environmental flow needs (through Senate Bill 1 of 1997 and Senate Bill 3 of 2007).

With Hurricane Ike, Lake Anahuac was lost for water supply due to saltwater inundation from storm surge, but drinking water for the City of Anahuac was provided through the canal system and the Trinity River. Recovery of the Lake as a source water was greatly facilitated by extensive spring rains, though the intensity of some of these storms damaged and impeded the reconstruction of the Lake's levees.

There are some indications that other water quality issues, for recreation especially, may be appearing in county streams, as they have in most streams in the greater Houston-Galveston area. The West Fork of Double Bayou has been identified on the State's list of impaired streams for high levels of bacteria and low dissolved oxygen, and a plan is being developed to collect more data on both the West and East forks. Tidal Cedar Bayou is also impaired from high levels of bacteria, as well as from industrial contaminants prevalent in Upper Galveston Bay.

[7] http://www.clcnd.com/ (History section)

Economics

A phone survey in 1991 of Chambers, Harris, Galveston, and Brazoria found that an estimated 9 percent of the households in the area derived their income from activities directly associated with the bay. Oil production, transportation, and construction were most often cited as bay-related economic activities.[8]

Ruth Millsaps

In terms of seafood, as of 2007, Galveston Bay ranked second as the most productive estuary in the United States, behind only Chesapeake Bay. Galveston Bay generates one-third of the state's commercial fishing income and over half of its recreational fishing. More blue crabs are commercially harvested in these waters than in any other Texas estuary. The bay produces more oysters than any other single body of water in the United States. Recreational fishing in the bay and associated activities generate $2.8 billion annually. The bay's commercial fishing industry adds approximately $350 million each year to the economy.[12]

In 2004, more than 235,000 fishing licenses were issued in the five counties surrounding the bay. Commercial fishing, which includes shrimping and oyster harvesting, helps drive the region's economy.

Selected Economic Data for Counties Surrounding Galveston Bay, 1992[9]

Attribute	Brazoria	Chambers	Galveston	Harris	Liberty
Total Employment	67,100.0	5,400.0	80,400.0	1,467,600.0	13,900.0
Percent of Total Employment in:					
Manufacturing	26.3	22.9	10.9	10.8	13.7
Services	14.6	11.5	16.5	27.1	26.6
Government	18.2	22.6	31.3	13.0	21.8
Trade	19.1	19.7	21.1	24.2	22.3
Construction	13.1	5.6	6.5	6.9	4.0
Agriculture Receipts (1,000,000s)	82.0	43.3	7.7	11.2	39.2
Oil Production (1,000s BBL[10])	3,119.0	2,466.0	1,377.0	4,851.0	2,414.0
Oil Taxable Value (1,000s)	60,827.0	47,544.0	26,776.0	96,146.0	47,008.0
Natural Gas Production (1,000s MCF[11])	60,241.0	23,967.0	14,239.0	29,106.0	11,180.0
Natural Gas Taxable Value (1,000s)	89,610.0	33,942.0	22,884.0	47,098.0	18,371.0
Retail Sales (1,000s)	1,288,775.0	141,396.0	1,436,684.0	28,596,036.0	364,379.0
Unemployment Rate (percent)	7.6	6.6	8.7	7.3	10.6
1990 Per Capita Income (dollars/yr)	13,468.0	12,218.0	13,993.0	15,202.0	9,982.0

Table III: Selected Economic Data for Counties Surrounding Galveston Bay, 1992

[8] Galveston Bay National Estuary Program. The State of the Bay: A Characterization of the Galveston Bay Ecosystem. 1994. p. 45.

[9] *Ibid.*, Table 4.7, p. 48.

[10] Barrels

[11] Million Cubic Feet

[12] http://www.tceq.state.tx.us/files/gi-369.pdf_4096473.pdf

Galveston Bay is the state's most important oyster fishery. In 2004, it produced 4.8 million pounds of oysters with a dockside wholesale value of $13.1 million. Smith Point in Chambers County is the home of some of the largest oyster businesses in the Galveston Bay system.

Commercial Fish Landings[13] from Galveston Bay Comparing 1890 to 1989[14]

		Total Landings (1,000s of Pounds)	
	Species	1890	1989
FISH:	Red Drum	404.2	0.0
	Black Drum	4.0	21.8
	Flounder	46.0	14.6
	Mullet	39.3	108.0
	Sheepshead	17.0	16.2
	Striped Bass	5.0	0.0
	Trout	427.4	0.0
	Other fish	542.9	60.5
	Total Fish	1,485.8	221.1
SHELLFISH	Oyster	1,657.1	705.5
	Crabs	162.5	2,149.5
	Shrimp	138.0	4,056.1
	Terrapins (Turtles)	2.4	0.0
	Other shellfish	0.0	13.4
	Total Shellfish	1,950.0	6,924.5
Total Fish and Shellfish		**3,435.8**	**7,145.6**

Table IV: Commercial Fish Landings–Compare 1890 to 1989

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Hurricane Ike delivered a major blow to the oyster fishery, with 50% to 60% of the consolidated oyster reefs in the Galveston Bay system covered with sediment (a total of approximately 8,000 acres).[15] The most cost-effective method for recovery of these reefs is yet to be determined.

About half of U.S. petrochemical production and almost one third of its petroleum refining can be found within the five counties in the bay area (Harris, Galveston, Liberty, Chambers, and Brazoria). In 2004, Chambers County produced more than 1.7 million barrels of oil and almost 24 million cubic feet of gas-well gas. The Chambers-Liberty Counties Navigation District and the Cedar Bayou Navigation District support the local commerce.[16]

Rice and cattle remain the cornerstones of Chambers County's agribusiness, with more than 49 percent of the total land dedicated to 610 farms and ranches. Pasture for livestock operations account for 44 percent of the farms and ranches; crops account for 49 percent. Farmers and ranchers collectively earned $13,374,000 in 2002, with livestock accounting for almost 60 percent of that total.[17]

As with the oyster fishery, Hurricane Ike caused major economic losses to agriculture in Chambers County. Rice went out of production, due to saltwater inundation of fields and the lack of freshwater in the canal system. Although slowly coming back, cattle-ranching became nearly non-existent, due to lack of feed, lack of freshwater, and destruction of fences. Some ranchers sold out completely, and it is unclear whether they will return to the business. However, with the aid of major volunteer efforts, some fences have been re-built. Also, at least one rancher leased grazing land within the federal Wallisville project, the northern part of which was not inundated by saltwater from the storm surge.

The People

For the better part of its history and despite being 40 miles from Houston, Chambers County has continued to be a rural community with a population of approximately 30,000 people. The growth is coming, however. Between 1990 and 2000, Chambers experienced a 29 percent increase in residents, and that rate is expected to keep at or near pace for the foreseeable future. The face of Chambers is changing, too, with Hispanics or Latinos comprising almost 11 percent of the population, nearly a five percent increase during the same ten-year period. African-Americans make up almost 10 percent of the population, and White/Non-Hispanics, 78 percent.

[13] Landings reflect changes in both biological and regulatory factors, and do not indicate more or fewer fish or shellfish present in the bay.

[14] Galveston Bay National Estuary Program, *Op cit.*, Table 4.8, p. 49.

[15] Communication with Lance Robinson, Texas Parks & Wildlife Department.

[16] Texas Handbook Online

[17] *Ibid.*

Ruth Millsaps

The median age of Chambers residents is 35 years old. Approximately 32 percent of the population is under the age of 20, and seniors over 65 years of age make up nine percent. More than 83 percent of homes are owner-occupied, and the average household size is just under three people.

In 2006, the median household income was $57,534, and the per capita income was $23,747. Almost 80 percent of the population had achieved a high school diploma, and nearly 12 percent had a Bachelor's Degree or higher.[18] The predominant employers for Chambers include the petroleum and chemical production industry, agribusiness, fish and oyster processing, and tourism.[19]

Population projections developed prior to Hurricane Ike showed the county population increasing from approximately 30,000 in 2005 to nearly 53,000 in 2035. While less than the very fast growing counties of Fort Bend, Montgomery, and Waller, this growth rate is typical for Harris and its other surrounding counties.

Hurricane Ike has undoubtedly changed the demographic picture of the county, resulting in both population emigration and loss of income. New population data, post Hurricane Ike, will not be available until the 2010 census.

Threats to Natural Resources

Because Chambers County's natural resources support its economy, preserving habitat is critical to the overall community's sustainability. More than 45 percent of the population resides within the two-mile Bay buffer zone, and many of the citizens rely directly on the Bay for their source of employment and income.[20]

Houston's continued growth, second-home buyers, the redevelopment of the I-10 corridor, and retirees are driving new development, especially in the portion of the county west of the Trinity River, but also creeping into the rural east. Residential development leads to new roads, utilities, and shopping centers—replacing natural drainage areas with impervious surfaces. This development infrastructure also results in:

- Fragmented habitats
- Compromised wetland function
- Increase pollution run-off
- Bay degradation
- Industrial/agricultural use-residential use conflicts

Residents and leaders in Chambers County already notice changes in the rural character that has long drawn people to live and work here, primarily with increased conversion of agricultural land to residential and commercial development.

According to community interviews, though, some 5th and 6th generation farmers have outside jobs to address the economics of agriculture and land values, which leads to neglect and loss of agricultural revenues. The loss of rice farms was noted several times by the community, as was the role rice farms have played in supporting bird viewing and hunting.

Working waterfronts face similar challenges because of the desirability of waterfront living, especially for the second-home market. Rising land values put pressure on waterfronts to convert to residential and commercial development, making it harder for the fisheries and sports fishing guides to thrive.

Farm and state roads face redevelopment, widening, and character changes with new development. Some of these roads are important community gateways and historic, scenic byways in need of protection and design guidelines.

[18] U.S. Census Data for Chambers County, Texas, 2006 Census.

[19] Texas Handbook Online.

[20] Galveston Bay Estuary Program. *Op cit.*, 2002. p. 41.

Conservation Goals for Chambers County

"To implement the Greenprint will require more people learning about Chambers County's stellar qualities. The more ways we make connections—internet, TV, radio, podcasting, social network sites, billboards, magazines, print and on-line, e-mail—the more people we reach. It's a case of, if they don't know, they can't come."

– Ruth Millsaps, Park Ranger, Wallisville Lake Project

Amy Turner

Through the Chambers County Greenprint, the committees and stakeholders, with numerous public participants and leaders, identified their six key conservation goals:

1. Preserve Natural Habitat
2. Target Restorable Habitats
3. Protect Water Quality
4. Protect and Restore Natural Drainage
5. Maintain Rural Character
6. Create More Public Access for Nature-Based Recreation

Preserve Natural Habitat and Target Restorable Habitats

Coastal wetlands are engines of biodiversity that cradle the creatures of the ocean, hold and filter water, and provide sustenance and haven for migratory birds and other wildlife. Protection of coastal wetlands—through a holistic approach that would involve acquisition, permitting, conservation easements, and restoration—is critical to the economic health of Chambers County. These wetlands support a $5 million infusion into the local economy from birdwatchers[21], as well as revenues from the fish and oyster processing industry. Additionally, in the late 1980's, an estimated $171 million in direct expenditures annually was attributed to recreational fishing interests in Galveston Bay.

The county is home to many species of birds and terrestrial animals because of its abundance of rivers, coastal wetlands, cypress forests, and pinelands. Fragmentation of habitats results in a cascading effect that negatively affects wildlife resources, and then ultimately affects an economy that is based on natural resources and agriculture, as is the case with much of Chambers County. By identifying the most important of these habitats to preserve and to restore, action can be taken to increase public investment, as well as provide incentives for private landowners to maintain, to acquire, and to manage these habitats for future viability.

[21] *Chambers County Comprehensive Recreation, Conservation and Economic Development Master Plan*, Page 45.

Protect Water Quality

While current water quality appears generally healthy, the impact of future development, and the nonpoint source pollution it generates, raises a red flag. Most of the water bodies in the urbanized communities surrounding Galveston Bay have ended up on the State's list of impaired waters. Already, Cedar Bayou and the West Fork of Double Bayou have been added to that list, along with East Bay, which receives waters from Chambers and Galveston counties. Maintaining an economy built on natural resources and agriculture, and not solely dependent on residential/commercial development, will help to protect water quality and drainage.

Protect and Restore Natural Drainage

Because of the flat terrain, flooding is a consideration that will become a growing concern as more impervious surfaces are created by development. The County must require retention or detention ponds for all new development.[22] Also, adhering to FEMA's policies related to development within the 100-year floodplain will help protect natural drainage. These policies require: (a) that the County appoint a Floodplain Administrator, (b) that all new development and renovations within the A-zone of the 100-year floodplain have the habitable floor elevation 12-inches above the Base Flood Elevation (BFE), and (c) that all new development and renovations within the V-zones of the 100-year floodplain have the bottom of the lowest stringer 12-inches above the BFE. Elevation compliance is determined by an approved Elevation Certificate.

Tom Douglas

Maintain Rural Character

Rice farming not only helps protect and restore the wetlands so important to the natural resources of Chambers County, but along with cattle ranching, it is a staple of the community's character. However, agriculture is a business like any other, and its success is subject to domestic and international market influences, environmental regulations, and land values. This agribusiness culture is important to the local and statewide economy and to the character of this community, which its residents seek to maintain. Instituting best practices for environmental restoration, soil restoration activities, focused marketing, agritourism, and working lands protection measures, in concert, can help local farmers with ensuring economic viability of growing and ranching into the future. Many of these same tools—such as conservation easements or purchase or transfer of development rights—could also be used to preserve/restore working waterfronts.

Create More Public Access for Nature-Based Recreation

Despite an abundance of protected lands, public access to these areas is somewhat limited, most especially for those who reside in the western portion of the county. New parks and recreational spaces need to be created in developing areas to provide for the active outdoor recreation needs of children and families, and this provision of public spaces can be accomplished through developer requirements, subdivision rules and regulations, and development impact fees.

Also important to the community—to build upon its growing profile as an ecotourism destination—is to work with the U.S. Army Corps of Engineers and the Department of the Interior to create more and better connectivity for land and water trails, primitive and structured camp sites, and wildlife viewing corridors. Efforts in this area may result in the more sustainable and low-resource-impact economic development of outfitters, trail guides, and bed-and-breakfasts.

[22] *Ibid.*, p. 21

Greenprint Mapping

"Greenprinting was a project that brought participation from all geographical areas of the County together to develop a plan to guide the future of the entire County."

– Pudge Willcox, retired Director, Chambers-Liberty Counties Navigation District

Amy Turner

For each of the goals, the committees and The Trust for Public Land's GIS team developed sets of criteria that were mappable and would characterize the successful accomplishment of that goal. Each criterion was weighted according to factors such as: relative importance for wildlife, current level of protection, accuracy and comprehensiveness of the underlying data, redundancy among criteria, and threats from development, among others. An example of a set of criteria would be the specific habitats for Preserve Natural Habitat: riparian corridors, flyway corridors, cypress swamps, oak mottes, marsh areas, and coastal prairies, plus important native plants and animals, and diversity.

The model framework with all the criteria is shown in Table VI on the next page, and the detailed criteria and their data sources are in Appendix A.

During the course of the discussions at the Priorities Meeting, stakeholders recognized that the top three conservation priorities deserved particular attention, because their accomplishment would also accomplish the remaining three. This is reflected in the final weightings of the goals. (See Table V on the next page.)

The accompanying maps (in the Visual Analysis section) show the results of TPL's modeling—coupling the community's weighted goals with the mapping of Chambers County's resources. On individual goal maps, the darker the red, the better that conservation within the area would meet the criteria of that particular goal. On the Overall Conservation Goals map (also included here on pages 24–25), the darker the red, the better conservation within the area would meet multiple community goals, according to the weighting in Table V.

The combined Greenprint Committee re-visited these goals after the Hurricane Ike experience, and concluded that Ike had not changed Greenprint goals, but, in fact, had only reinforced their importance. Of additional interest is the relationship between the areas of highest conservation value to the community and the areas inundated by Hurricane Ike. The surge from Ike flooded approximately half the county, and included most of the areas identified as best meeting multiple goals for conservation. Thus, conservation in these areas would further enhance community resilience, by keeping people and structures out of harm's way. (See Map: *Hurricane Ike Storm Surge with Overall Conservation Priorities* on page 41.)

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The maps and tables support the following important general conclusions:

- More than one-third of the Chambers County study area meets multiple goals for conservation: a total of 147,188 acres—a testament to the county's wealth of natural resources.
- The amounts of highly ranked acreages for individual goals are also typically more than one-third of the study area, with lands suitable for two of the six—restoring habitats and maintaining rural character—approaching three-quarters of the study area.
- Although several large tracts of the county's important habitat have been saved, most of the land valuable for conservation remains undeveloped and unprotected.
- Conserving those parcels that meet multiple goals with high rankings results in achieving the overall conservation goals in the most cost effective manner.

Strategies for success in achieving Greenprint goals may vary. One might be to conserve those lands with the highest rankings; another to focus on those lands that meet multiple goals. Still another approach would be to target those projects for which funding is most easily secured. Often, success is achieved by putting together a funding "quilt."

While maps and models are only as good as the data and input that underly them, it is clear from these results that there is ample potential for Chambers County's treasured landscapes to undergo dramatic and even unwelcome change if further conservation action is not taken.

Although the challenge of protecting the amount of highly ranked land is daunting, and perhaps threatening to some, it is important to recognize that not all of the remaining highly ranked land can or will be conserved, and that not all of it is under imminent threat. Some land may not be highly developable; some may belong to landowners who will keep it open despite having more lucrative alternatives; and some may belong to landowners who do not wish to consider conservation options in the near future.

Nonetheless, the opportunities to protect important parcels far exceed available funding and the staff capacity of the county. If Chambers County is to maintain its natural resources and the community's rural character by protecting its most cherished lands, assertive implementation of a conservation vision is essential.

Conservation Priority	Weight
Protect Natural Habitat	38%
Protect Water Quality	28%
Target Restorable Habitats	20%
Maintain Rural Character	8%
Protect and Restore Natural Drainage	5%
Create More Public Access for Nature-Based Recreation	2%

Table V: Conservation Priorities Weightings

Chambers County Greenprint Model Framework

A. Preserve Natural Habitat
- Riparian Corridors
- Flyway Corridors
- Coastal Prairies
- Oak Mottes
- Marsh Areas
- Cypress Swamps
- Important Native Plants and Animals
- Maintain Diversity

B. Target Restorable Habitats
- Former Rice Fields
- Other land that has been leveled and farmed
- Oil Fields
- Shoreline Restoration
- Constructed Reservoirs/Water Bodies

C. Protect Water Quality
- Riparian Buffers
- Wetlands
- Drinking Water Sources
- Freshwater Inflows
- Coastal Prairies

D. Protect and Restore Natural Drainage
- Natural Drainage
- Improved Drainage with Natural Cover
- 100-yr Floodplains
- Floodways
- Coastal Prairies

E. Maintain Rural Character
- Active Agricultural and Aquaculture Areas
- Scenic Bay, Bayous, Lakes, and River Shorelines
- Historic Areas
- Historic and Active Working Waterfronts
- Scenic Roadways
- Areas with Rare and Unique Plants and Animals
- Private Hunting

F. Create More Public Access for Nature-Based Recreation
- Fishing Access
- Birding Sites
- Hiking Trails
- Biking Trails
- Equestrian Trails
- Canoe and Kayak Access
- Boat Ramp Access
- Parks and Playgrounds

Table VI: Chambers County Greenprint Model Framework

Strategy Exchange

Linda Shead

As a follow-up to the Greenprint mapping and modeling, the stakeholders identified several challenges to implementation of the Greenprint, some which would likely require solutions beyond just land conservation. Four such questions were identified for additional investigation. These questions, and the Greenprint goals to which they relate, are:

1. *How can farmers and ranchers increase wildlife-based uses for greater income diversification?*
   - Preserve natural habitat
   - Target restorable habitats
   - Maintain rural character
   - Create more public access to nature-based recreation
2. *How can corporate-owned lands be conserved for habitat purposes?*
   - Preserve natural habitat
   - Target restorable habitats
   - Protect water quality
   - Create more public access to nature-based recreation
3. *How can farmers viably produce alternative crops for local farmers markets to provide income diversification?*
   - Maintain rural character
   - Protect water quality
4. *How can existing funds be accessed and utilized, and new non-federal funds be created, to support land conservation? Where are funds for saving the working lands and local character?*
   - Preserve natural habitat
   - Target restorable habitats
   - Protect water quality
   - Protect and restore natural drainage
   - Maintain rural character
   - Create more public access to nature-based recreation

Working with community stakeholders to discuss innovative means of addressing these questions, The Trust for Public Land hosted the Conservation Strategy Exchange in Chambers County on May 12-15, 2008. Experts from

Bobby Hall

across the country and the region, who have grappled with similar challenges, traveled to Anahuac to share their experiences, expertise, and ideas with their peers in Chambers County. They put in long hours digesting the information provided to them in order to develop targeted recommendations for consideration. Members of the Exchange Team were:

Wildlife-Based Income Diversification:

Miles Phillips, *State Program Lead/Nature Tourism, Texas AgriLife Extension Service, College Station*

Amos Cooper, *Assistant Area Manager, Texas Parks & Wildlife Dept., Port Arthur*

Monique Slaughter, *Natural Resource Specialist, Texas Parks & Wildlife Dept., Port Arthur*

Conservation Funding:

Will Abberger, *National Director, Conservation Finance, The Trust for Public Land, Tallahassee, Florida*

Conservation on Corporate Lands:

Kristina Hardwick, *Public Education and Outreach Specialist, Houston-Galveston Area Council, Houston, Texas*

Alternative Crops for Income Diversification:

Dr. Bob Randall, *Founder, Urban Harvest, Houston, Texas*

Additionally, Amy Condon, *Program Manager, Conservation Vision, The Trust for Public Land, Miami, Florida,* provided facilitation for discussion sessions.

The Exchange Team followed a schedule of roundtables, presentations, tours, discussions, and community gatherings designed by the local committee to illustrate community issues. The roundtable discussions included team members and local participants with expertise on the subjects. Each provided a short presentation that formed the basis for a dialogue among the team members, local experts, and other attendees. Local experts also participated in the land and water tours of the county and provided information, guidance, and assistance for the Exchange Team. These local experts are presented in Appendix 2 and Appendix 3.

The team integrated all the information into their recommendations, and TPL staff then compiled these into a draft report of the Conservation Strategy Exchange.

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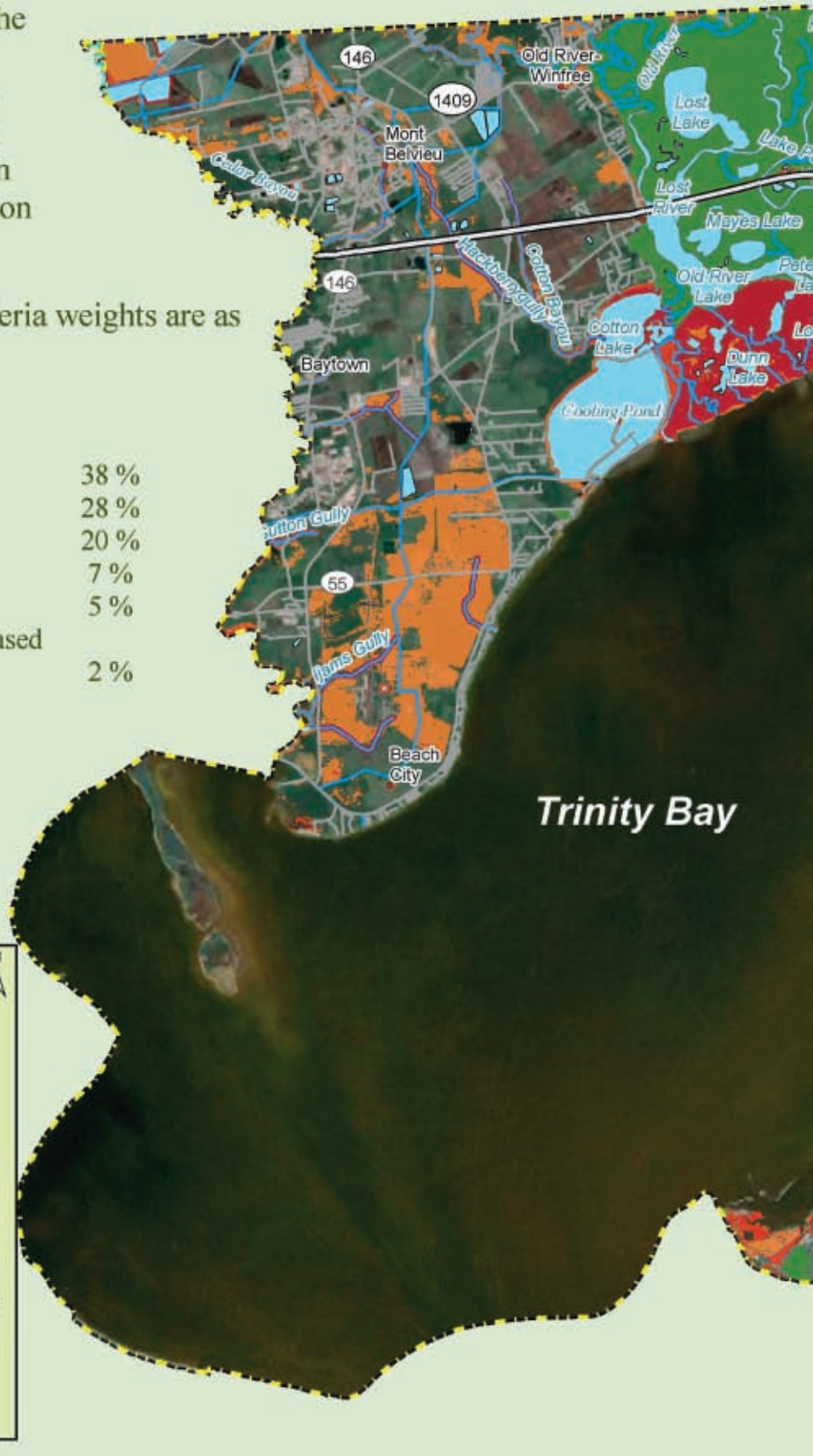
Chambers County, Overall Conserv

This map shows the results from the Chambers County Greenprint Overall Conservation Priorities model. Areas in red have a high conservation value, while areas in orange have a moderate conservation value.

Overall Conservation Priorities criteria weights are as follows:

Preserve Natural Habitat	38 %
Protect Water Quality	28 %
Target Restorable Habitats	20 %
Maintain Rural Character	7 %
Protect and Restore Natural Drainage	5 %
Create More Public Access for Nature Based Recreations	2 %



0 0.5 1 2 Miles

Legend

- Chambers County
- Parks and Protected Land
- Waterbodies
- Rivers, Streams, Bayous or Canals

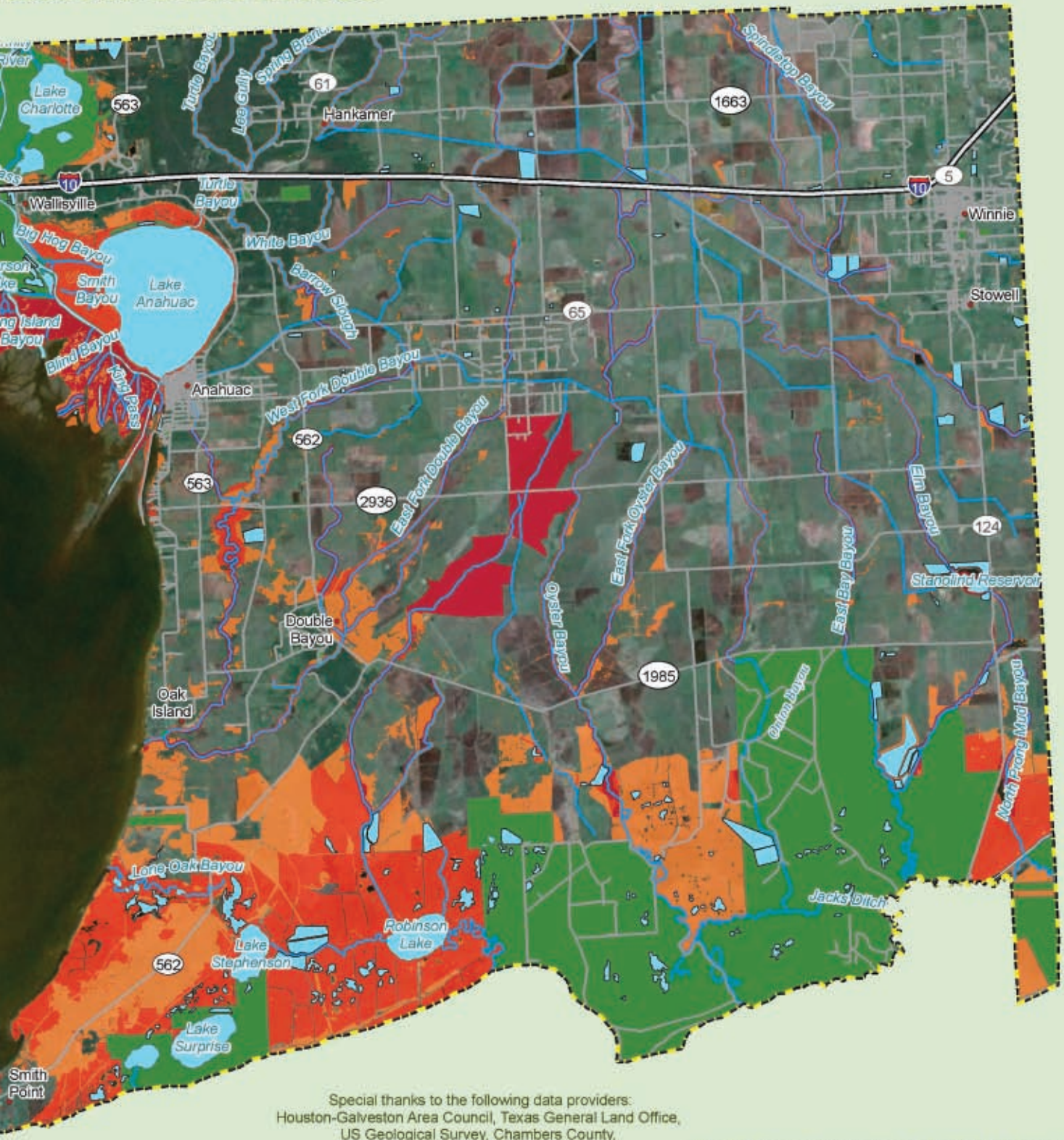
Transportation

- Interstate
- Public Roads

Overall Conservation Priorities

- Highest Ranking
- Moderate Ranking

TX Greenprint
vation Priorities



Special thanks to the following data providers:
Houston-Galveston Area Council, Texas General Land Office,
US Geological Survey, Chambers County,
ESRI, Greenprint Coordinating Committee
Map created by the Trust for Public Land
on April 2, 2008

Created in ArcMap 9.2®
Map Projection:
NAD 1983 State Plane Texas South Central FIPS 4204 Feet

Information on this map is provided for purposes of discussion and visualization only.

Recommended Goals and Strategies

"Having lived and worked in Chambers County for over 60 years and remembering the abundance of wildlife during that time, I hope that the 'Greenprint for Growth and Conservation for Chambers County' will be used to preserve and develop the natural resources I have enjoyed over those years. I hope that this Greenprint will be used and not put on a shelf to collect dust."

– Bobby Hall, retired Chambers County Surveyor

Waterborne Education Center

Allowing time for some recovery from Hurricane Ike, the Greenprint Committee reconvened in early 2009 to discuss, revise, and augment the Exchange Team's recommendations to meet the identified challenges and all the Greenprint goals. The following is a summary of the Greenprint Committee's recommendations (in no particular order). They follow closely those in the *Chambers County, Texas Conservation Strategy Exchange Report*, where full details on most of the recommendations may be found.

The recommendations cover nine overarching actions that would contribute to success across many of the community goals for conservation, plus six categories of more focused actions. The overarching recommendations represent recurring themes among the exchange questions and are explored in greater detail within the other categories.

Overarching Recommendations

1. Promote the Chambers County Greenprint as a unified conservation vision for the county, and coordinate with overlapping projects in the Long-Term Community Recovery Plan.
2. Increase access to information and resources through the County's web site, as well as through community organizations, festivals, agricultural groups, parks, and other community sites.
3. Promote success stories and testimonies by community residents.
4. Create small and manageable demonstration projects to achieve and build upon successes.
5. Diversify agricultural and recreational activities for sustainable economic development.
6. Provide hands-on, experiential youth education in the natural environment to cultivate the next generation of growers, ranchers and community stewards.
7. Provide information regarding best practices across businesses and industries that could be applied in Chambers County.
8. Increase the County's capacity for grant writing, marketing, and technology.
9. Establish a web-based Internet mapping site for the County, municipalities and interested stakeholders to use for planning and management purposes, and work with ChaRT on County-Wide Vision Planning.

Increase Wildlife-Based Uses for Farms and Ranches

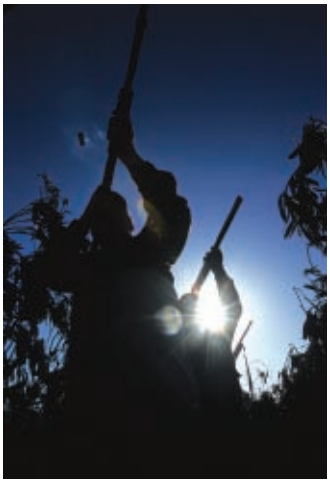
Nature tourism is big business, and one that can be balanced with production uses, such as grazing and growing. Hunting, fishing, and viewing of wildlife contribute $15.8 billion to the Texas economy.[23] Other nature-based activities that provide economic benefits include: nature tourism, cultural tourism, adventure travel, agritourism, and wildlife photography safaris.

Furthermore, agricultural and open lands generate more public revenue than they receive in public services (such as schools, fire protection, and road maintenance). More than one hundred Cost of Community Services studies conducted by the American Farmland Trust, across the U.S. including Texas, show that on average, working and open lands receive $0.36 in public services for every $1.00 in tax revenue raised from that land.[24]

By diversifying income, recommendations in this category will help create a more sustainable economic base for agriculture. Since farmers and ranchers own and manage a significant percentage of the private land in the county, these recommendations will also help meet several Greenprint goals: protect and restore habitats, protect water quality, and, most especially, maintain the rural character of the county. These features are valued by county residents and tourists alike.

Recommendations to increase wildlife-based uses on farms and ranches, for income diversification and an increased tax base, are:

1. Inventory existing nature-based tourism opportunities and participate in the AgriLife Extension Service's survey.
2. Provide resources to landowners interested in creating nature-based tourism experiences.
3. Investigate using existing funds to hire a recreation/tourism marketing and development professional.
4. Develop a marketing campaign that promotes facilities, events, providers, and support services.
5. Form a landowner wildlife cooperative/educational group to explore available resources, including technical assistance and other successful models in the state.
6. Select and nurture a demonstration project.
7. Encourage development of ancillary services businesses, such as bed and breakfast establishments, inns, restaurants, and guide and tour providers.
8. Work with ChaRT on their Ecotourism Marketing and Outreach project.
9. Work with ChaRT on AgLand Mapping and Reuse Assessment to incorporate nature-based recreation and tourism.



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Access, Utilize, and Create Funds

The size of the funding pie available to Chambers County to support land conservation can be increased by improving access to existing funds, by creating new non-federal funds, and/or by enhancing the funding "quilt" for projects—piecing together funds from different sources. All levels of funding need to be explored: local, state, and federal, as well as private.

While many land conservation projects are achieved with a funding quilt, most funding for land conservation across the country has been created at local and state levels, with local funding the most dependable. Additionally, most federal funding sources require a non-federal match.

In fact, the largest source of conservation funding, in terms of impact, is ballot measures (and the smallest is private contributions, though they can be an important piece in the funding quilt). Statistics show that land conservation ballot measures are non-partisan—supported regardless of whether the community is conservative or liberal—and succeed in at least three out of four cases across the country. Texas has a greater rate of success of measures than any other state. A useful resource for seeing the trends and details of ballot measures is www.landvote.org. A successful ballot measure is a two-step process: getting the right measure on the ballot and getting the voters to say "yes," both of which require thorough preparation.

[23]Southwick Associates. Texas - 2006 Economic Contributions of Fishing, Hunting and Wildlife Watching in Texas. http://www.southwickassociates.com/freereports/default.aspx

[24]American Farmland Trust. 2002. Fact Sheet: Cost of Community Services Studies. Online, 3/14/09, http://www.farmlandinfo.org/documents/27757/FS_COCS_11-02.pdf


Amy Turner

Increasing the availability of conservation funding will help achieve all six of the Greenprint goals: protect and restore habitats, preserve the county's rural character, protect water quality, protect natural drainage, and create more public access for nature-based recreation.

Recommendations to access, utilize, and create funding for land conservation, through voluntary acquisitions and saving working lands, are:

1. Inventory federal and state land conservation grant funding programs that Chambers County would be eligible for, but is not currently utilizing.
2. Consider establishing a dedicated source of County funding for land conservation.
3. Explore the possibility of municipalities in Chambers County establishing dedicated sources of funding or working with special purpose districts to conserve land and enhance recreational access to protected lands.

Protect and Restore Habitats

Habitats function as food, shelter, and nesting and resting areas for wildlife. Their protection also helps protect water quality and reduce flooding problems by avoiding uses that increase polluted runoff, by absorbing some contaminants, and by acting as a sponge for excess runoff.

The Greenprinting process identified and evaluated six different natural habitat types: riparian corridors, flyway corridors, coastal prairies, oak mottes, cypress swamps, and marsh areas. Important native plants and animals and ecological diversity were also considered. Habitats targeted for restoration were: former rice fields, other lands that have been leveled and/or farmed or grazed, oil fields, constructed reservoirs or other water bodies, and eroding shorelines.

Recommendations to enhance habitat protection and/or restoration are:

1. Working with the Greenprint Committee, landowners, ChaRT, the Parks Advisory Board, and the County grantwriter, develop a program to identify specific priority projects for habitat preservation and/or restoration.
2. Provide additional information to private landowners about less-than-fee-simple land conservation techniques, including conservation easements.
3. Consider creation of wetlands banks to protect and restore habitat as development proceeds across the county.
4. Support ongoing initiatives to create habitat-friendly shoreline protection along East Bay and Trinity Bay. (Coordinate with ChaRT.)
5. Ensure that saltwater gates are repaired to protect brackish and fresh coastal marshes. (Coordinate with ChaRT.)

Conserve Corporate-Owned Lands for Habitat

Managed appropriately, corporate-owned lands can and do support wildlife and provide many benefits both to the company and the public:

- Having more land in habitat increases the amount and diversity of wildlife, which can add economic benefits from nature tourism.
- Trees save air conditioning costs and reduce erosion and stormwater runoff, as well as contribute to air pollution control.
- Wildflower meadows reduce mowing and watering costs and provide free re-seeding, as well as supporting pollinators.
- Riparian buffers absorb up to forty times more water than urban areas and tilled agricultural fields.[25]

Corporate conservation with access for employees, such as wellness trails, can also provide:

- quality-of-life opportunities,
- reduced health care costs,
- positive public relations,
- increased employee morale,
- workforce development opportunities through internships and teacher experiences,
- employee recruitment and retention advantages, and
- science and math educational opportunities.

[25] www.riparianbuffers.umd.edu/slideshow/sld006.htm

Public access, such as through managed visitation at specific locations and roadside wildlife viewing platforms, can also increase good neighbor relationships with communities.

While the east side of the county is largely in agriculture, the west side has large tracts held by corporations, which require a somewhat different approach to habitat conservation; hence the different strategies in the following recommendations:

1. Survey and map industrial/corporate lands that are currently used for buffer, wildlife habitat, green and open spaces.
2. Conduct connectivity analysis of corporate lands for habitat linkages.
3. Establish County awards program for corporate stewardship.
4. Review subdivision guidelines for municipalities and the County to incorporate encouragement for habitat protection.
5. Institute a Public Agency Corporate Ombudsman position to coordinate with the County, cities, and state agencies.

Increase Public Access for Nature-Based Recreation

A wide variety of potentially publicly accessible nature-based recreation activities were mapped during the Greenprinting process: fishing access, birding sites, hiking trails, canoe and kayak access, power boat access, parks and playgrounds, biking trails, and equestrian trails. Also, throughout the Long-Term Community Recovery planning process, Chambers County residents reiterated their desire for broader recreational opportunities. The following specific projects have been identified through the Greenprint process:

1. Create a county-wide parks and recreation master plan. (Coordinate with ChaRT.)
2. Establish a program of park fees and/or set-asides for new development.
3. Create more public trails, such as: Lake Anahuac to Wallisville, along the Main Canal to Four Corners, the streets of old Wallisville, and a boardwalk from Fort Anahuac to the Anahuac Harbor.
4. Re-build Fort Anahuac.
5. Dredge channels for recreational vessels (and beneficial uses of dredge material). (Coordinate with ChaRT.)


Bobby Hall

Viably Produce Alternative Crops

Rice farming and cattle grazing continue to be the major agricultural land uses in Chambers County. However, the county's rural character does in fact also include a history of extensive vegetable and fruit production. The challenge is how to increase the awareness of the possibilities for those in Chambers County who might be interested in income diversification, and at a level where they will be successful.

Approximately 5.7 million people live within an hour's drive of Chambers County, consuming about 16,000 tons of food per day. In addition, high oil prices are making the long-distance food trade that currently produces this bounty more and more costly.

At the same time, health and medical experts are suggesting that people cut back on salts, fats, and sugars, and eat more vegetables and fruits. Thus, there is a growing market for fresh local produce and other quality farm products. Large numbers of the more affluent in Houston's population will pay high prices for them.

Crop diversification may require thinking differently about segmenting large landscapes for different crops and seasons. Diversification can give existing farmers alternative income streams in bad years and give newcomers opportunities even when they lack the capital and expertise to get into large-scale row cropping.

Keeping land open for alternative crops can be assisted with the following strategies:

1. Provide information to individuals who want to produce and sell alternative farm products.
2. Help youth develop an interest in farming.
3. Help existing farmers who may want to explore alternative markets for their products.

Action Plan for the Chambers County Greenprint

"One of the Greenprint's strengths is that it relied on local knowledge about the resources in the county. This local knowledge helped galvanize public support and encourages those of us who live and work here to turn the plan into action."

–Don Brandon, P.E.,
Chambers County Engineer

Ruth Millsaps

A plan is only as good as its implementation. To that end, the Greenprint Committee and stakeholders identified the top ten key actions that need to be accomplished within the next 12-24 months. While action on any and all of the recommendations will help with Greenprint implementation, many are long-term goals. Stakeholders recognize the following "Top Ten" actions as the most critical for immediate attention, with the first six being the highest priorities:

1. *Develop a better plan to manage drainage that also protects water quality.*

2. *Establish subdivision and development guidelines at the municipal and county levels.*
   These guidelines should ensure compatibility with habitat protection and include:

   - Making business development tax abatements available only if developer goes above and beyond basic guidelines to ensure that greenspace and rural character are preserved (with no breaks for developers unwilling to do so); and
   - Requiring environmental evaluations for developments in Chambers County Greenprint priority conservation areas.

3. *Increase County capacity in marketing for recreation and tourism.*
   As one committee member said, "If they don't know, they can't come." Increased marketing should include the following:

   - Capitalizing on Chambers County's resources and the potential for sustainable economic development ($1 billion spent in Texas in 2006 related to wildlife watching);
   - Developing a marketing campaign for ecotourism and other nature-based recreation;
   - Assisting with formation of a landowner wildlife cooperative/education group;
   - Creating a demonstration project (e.g. a business plan with a local landowner); and
   - Coordinating with ChaRT.

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4. Work with ChaRT on projects of mutual interest.

The following LTCR projects overlap with Greenprint goals:

- Restoration and Protection of Coastal Marsh
- Vision and County-Wide Planning
- County-Wide Parks and Recreation Master Plan
- Ecotourism Marketing & Outreach
- AgLand Marketing and Reuse Assessment
- Shore Protection and Beach Nourishment
- Restoration of Navigation Channels
- County-Wide Drainage Improvements
- Public Oyster Reef Restoration
- Implement Programs to Control Invasive Species

5. Support existing local nature-based education programs.

Such programs include the U.S. Fish & Wildlife's new visitor center and the Waterborne Education Center. These and other initiatives could be enhanced through outreach and partnerships to:

- Work with local schools and youth groups (science classes, 4H, church, scouts, etc.) to promote and incorporate outdoor education in their programming and curricula.
- Coordinate with nature tourism marketing program to offer increased nature-based opportunities also for adults and families.

6. Add County grantwriting capacity, as soon as possible.

This person would:

- Locate existing funds to support conservation, recreation and public access to natural resources in the county, recognizing that making connections (putting together the funding "quilt") can increase the size of the available pie; and
- Assist the County and other like-minded entities (i.e., landowners, governments, corporations, and nonprofits) in securing the funds.

7. Target upscale, small-scale lodging to realize economic benefit of nature/rural-lifestyle tourism.

8. Establish a County awards program for corporate stewardship of natural resources.

9. Investigate programs that can help control invasive species on large open lands.

One program might be to enforce requirements to keep subsidized land weed-free. (Coordinate with ChaRT.)

10. Develop a program to identify specific projects for habitat preservation and/or restoration.

Priority projects would be selected in collaboration with the Greenprint Committee, landowners, ChaRT, and the County grantwriter.

Bobby Hall

Conclusions

"The Greenprinting project is an essential step toward achieving a community vision for Chambers County. From this vision, the county will have a solid foundation from which to act in preserving the areas that are so important to its residents and so vital to our state's coastal resources."

—Hon. Jerry Patterson,
Commissioner,
Texas General Land Office

Amy Turner

The *Chambers County Greenprint for Growth and Conservation* provides a road map for action. Lands that offer the greatest opportunities for meeting community goals are highlighted on the Greenprint maps. By focusing on these high value lands and using the recommendations on the most viable funding sources for land conservation, Chambers County residents can move forward to conserve critically important lands. Likewise, the specific action steps will ensure that the Greenprint is more than a paper plan. Many of these supporting activities will help create a culture of conservation that will preserve the county's rural character for generations to come.

The goals, models and maps, recommendations, and action plan of the *Chambers County Greenprint for Growth and Conservation* program are the culmination of extensive public involvement in pursuit of a common vision for the county: 18 meetings of the Greenprint committees, 4 public stakeholder meetings, and 5 public workshops during the Strategy Exchange Week.

Also telling is the overlap of the Greenprint results with those of the *Long-Term Community Recovery Plan, Chambers County, Texas*. Even though the two programs had some participants in common, they also involved many others from communities across the county; yet the two programs share many recommendations, indicating a high level of consensus for future directions in the county.

A variety of measures may prove effective in achieving the community-defined Greenprint goals. Natural areas could be preserved and linked together through a trail network, for recreational as well as natural resource benefits. Farmers and ranchers could collaborate to find additional resources for nature-based activities on their lands, for income diversification. Local and national initiatives to conserve habitat on corporate lands would benefit businesses and residents. The County, cities, and economic development organizations could offer—and perhaps share—leadership in providing resources and guidance to those seeking to implement Greenprint strategies.

Such actions will help preserve what Chambers County residents value—the rural lifestyle and the treasured landscape, wildlife, and fisheries. Ensuring that these important attributes of life in Chambers County remain will also reap benefits for the county in economic diversification and sustainability.

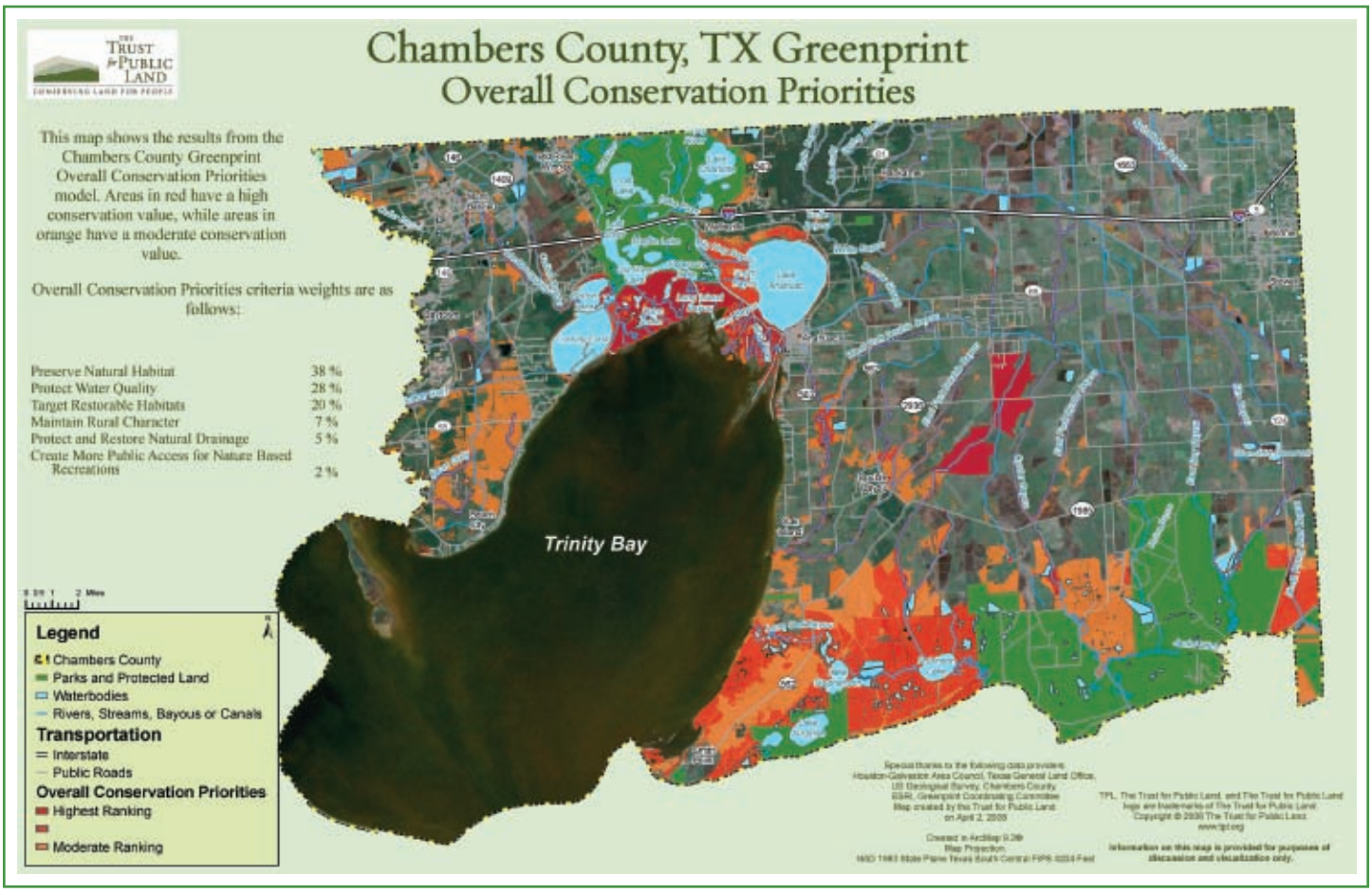
Visual Analysis

Miles Phillips

The following eight pages contain the Greenprint maps for Chambers County. The maps show the areas where voluntary land conservation would best contribute to meeting the conservation goals of the community, as described on pages 18-19. Local committees established the criteria for the goals, which were then incorporated into the model framework that resulted in the maps. (See also pages 20-21 and Appendix A).

In each of the maps, areas in red have a high conservation value, and areas in orange have a moderate conservation value. The first map shows the results of the overall priorities model, which overlays the results of each of the individual goals with a weighting established by stakeholders. This map is followed by individual maps for each of the goals. The last map in the set shows the areas inundated by the storm surge from Hurricane Ike (with yellow hash marks) over the overall conservation priorities map.

Overall Conservation Priorities Map and Profile Report



Chambers County Greenprint Overall Resource Profile Report

Chambers County, TX–May 9, 2008

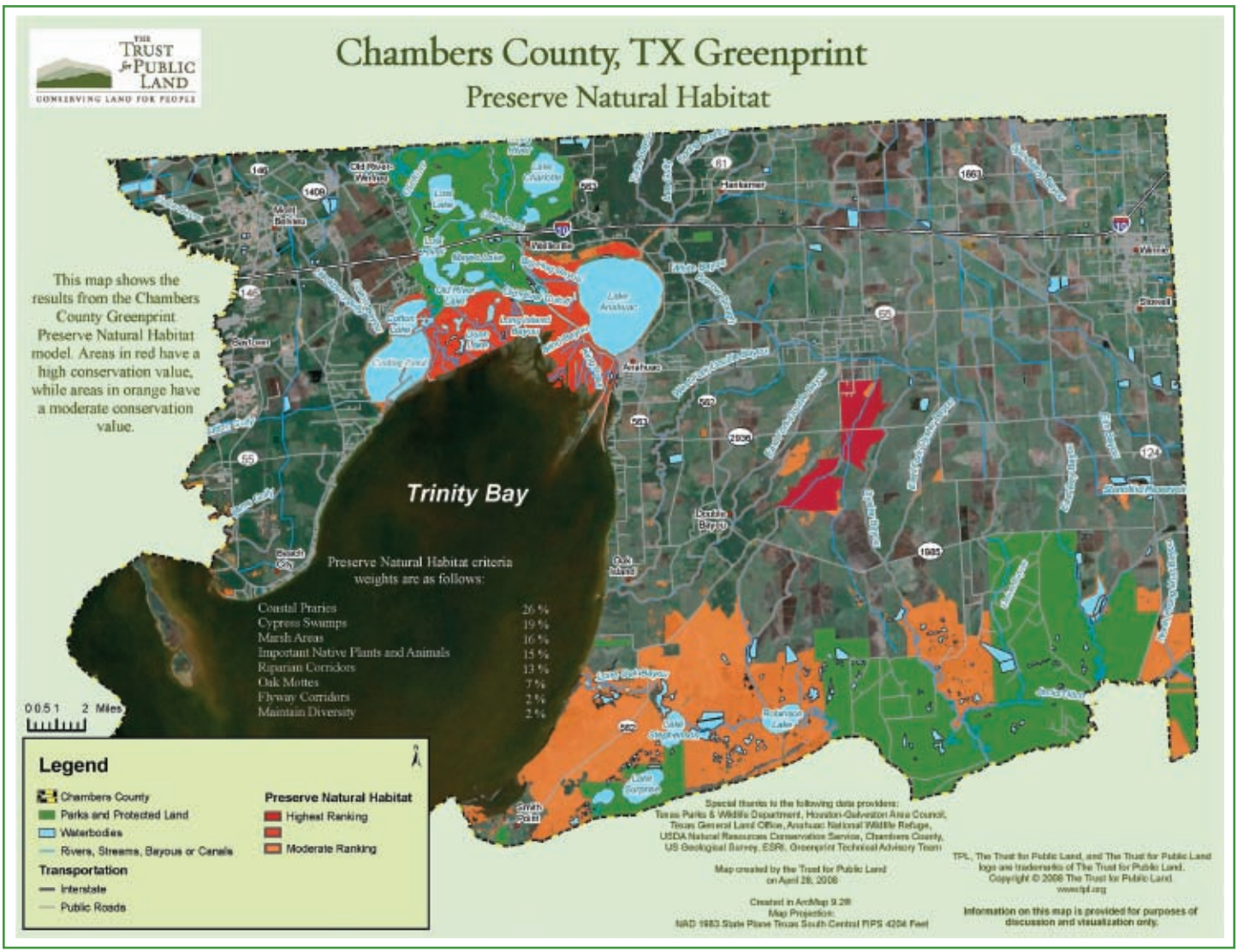
Total Study Area = 403,000 acres*; All Developed Land = 62,360 acres**; All Protected Land = 58,439 acres***

Goal	Goal Weight	Priority Acres****	Protected Priority Acres	% of Priority Acres	Developed Priority Acres	% of Priority Acres	Unprotected/ Undeveloped Priority Acres	% of Priority Acres
OVERALL CONSERVATION	Composite	147,188	45,919	31.2%	1,875	1.3%	99,677	67.7%
Preserve Natural Habitat	38%	128,947	45,970	35.7%	2,813	2.2%	81,003	62.8%
Target Restorable Habitats	20%	292,632	31,820	10.9%	10,456	3.6%	250,977	85.8%
Protect Water Quality	28%	167,239	48,140	28.8%	1,964	1.2%	117,403	70.2%
Protect and Restore Natural Drainage	5%	156,695	29,831	19.0%	7,094	4.5%	120,330	76.8%
Maintain Rural Character	7%	304,052	33,527	11.0%	12,257	4.0%	258,880	85.1%
Create More Public Access for Nature-Based Recreation	2%	150,642	36,892	24.5%	5,279	3.5%	109,349	72.6%

* The Study Area includes Chambers County land area (not including Trinity and Galveston bays)
** Developed Lands based on HGAC 2005 landcover
*** Protected Land includes all parkland
**** Priority lands score 3 or greater on a scale of 0–5 for the listed goal.

Table VII: Overall Conservation

Preserve Natural Habitat Map and Profile Report



Chambers County Greenprint Resource Profile Report

Chambers County, TX–May 9, 2008

GOAL: Preserve Natural Habitat (38% of total weight)

Total Study Area = 403,000 acres*; All Developed Land = 62,360 acres**; All Protected Land = 58,439 acres***

Goal	Goal Weight	Priority Acres****	Protected Priority Acres	% of Priority Acres	Developed Priority Acres	% of Priority Acres	Unprotected/ Undeveloped Priority Acres	% of Priority Acres
PRESERVE NATURAL HABITAT	100%	128,947	45,970	35.7%	2,813	2.2%	81,003	62.8%
Riparian Corridors	13%	47,068	12,049	25.6%	1,119	2.4%	34,079	72.4%
Flyway Corridors	2%	160,651	46,871	29.2%	4,110	2.6%	110,622	68.9%
Coastal Prairies	26%	16,715	168	1.0%	532	3.2%	16,032	95.9%
Oak Mottes	7%	5,980	46	0.8%	31	0.5%	5,903	98.7%
Cypress Swamps	19%	24,973	13,643	54.6%	142	0.6%	11,252	45.1%
Marsh Areas	16%	70,416	33,929	48.2%	1,300	1.8%	35,886	51.0%
Important Native Plants and Animals	15%	39,890	8,333	20.9%	2,510	6.3%	29,173	73.1%
Maintain Diversity	2%	108,592	11,124	10.2%	407	0.4%	97,077	89.4%

* The Study Area includes Chambers County land area (not including Trinity and Galveston bays)

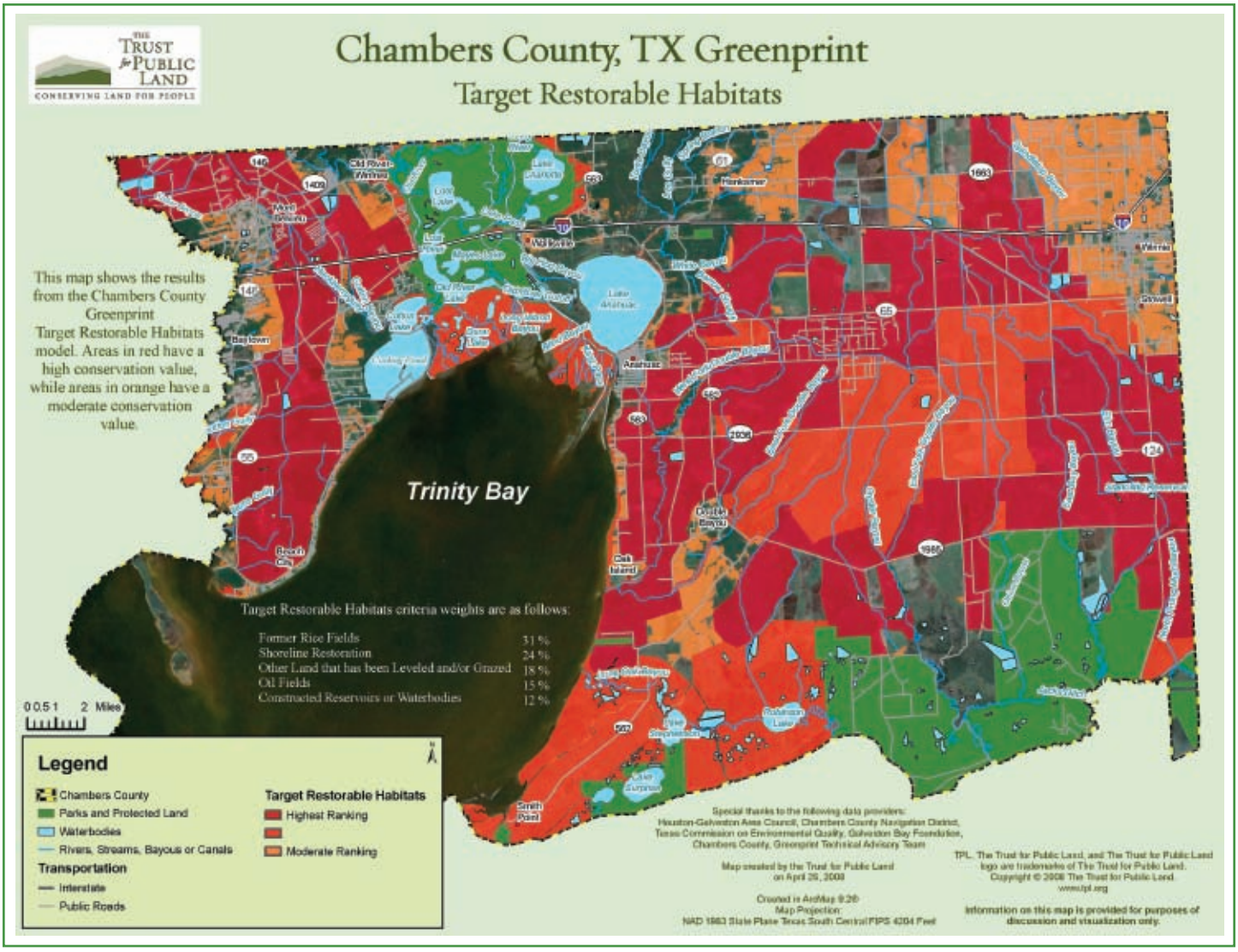
** Developed Lands based on HGAC 2005 landcover

*** Protected Land includes all parkland

**** Priority lands score 3 or greater on a scale of 0–5 for the listed goal.

Table VIII: Preserve Natural Habitat

Target Restorable Habitats Map and Profile Report



Chambers County Greenprint Resource Profile Report

Chambers County, TX–May 9, 2008

GOAL: Target Restorable Habitats (20% of total weight)

Total Study Area = 403,000 acres*; All Developed Land = 62,360 acres**; All Protected Land = 58,439 acres***

Goal	Goal Weight	Priority Acres****	Protected Priority Acres	% of Priority Acres	Developed Priority Acres	% of Priority Acres	Unprotected/ Undeveloped Priority Acres	% of Priority Acres
TARGET RESTORABLE HABITATS	100%	292,632	31,820	10.9%	10,456	3.6%	250,977	85.8%
Former Rice Fields	31%	144,987	3,137	2.2%	6,791	4.7%	135,146	93.2%
Other land that has been leveled and/or farmed or grazed	18%	150,698	1,061	0.7%	718	0.5%	148,929	98.8%
Oil fields	15%	4,180	254	6.1%	35	0.8%	3,895	93.2%
Constructed Wetland Reservoirs or Waterbodies	12%	2,347	0	0.0%	13	0.5%	2,334	99.5%
Shoreline Restoration	24%	158,037	30,197	19.1%	4,893	3.1%	123,520	78.2%

* The Study Area includes Chambers County land area (not including Trinity and Galveston bays)

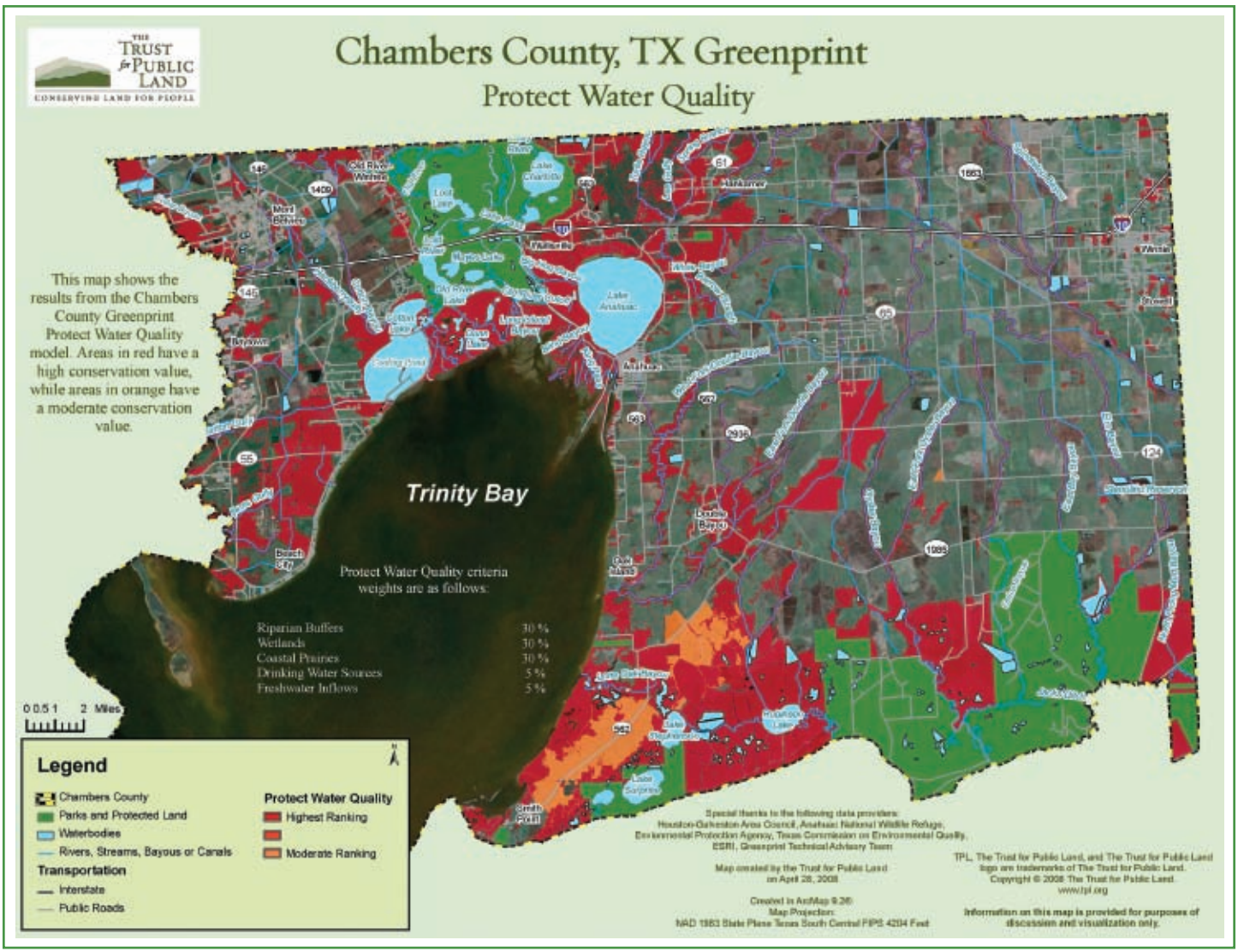
** Developed Lands based on HGAC 2005 landcover

*** Protected Land includes all parkland

**** Priority lands score 3 or greater on a scale of 0–5 for the listed goal.

Table IX: Target Restorable Habitats

Protect Water Quality Map and Profile Report



Chambers County Greenprint Resource Profile Report

Chambers County, TX–May 9, 2008

GOAL: Protect Water Quality (28% of total weight)

Total Study Area = 403,000 acres*; All Developed Land = 62,360 acres**; All Protected Land = 58,439 acres***

Goal	Goal Weight	Priority Acres****	Protected Priority Acres	% of Priority Acres	Developed Priority Acres	% of Priority Acres	Unprotected/ Undeveloped Priority Acres	% of Priority Acres
PROTECT WATER QUALITY	100%	167,239	48,140	28.8%	1,964	1.2%	117,403	70.2%
Riparian Buffers	30%	47,068	12,049	25.6%	1,119	2.4%	34,079	72.4%
Wetlands	30%	125,092	41,136	32.9%	368	0.3%	83,671	66.9%
Drinking Water Sources	5%	22,378	15	0.1%	1,636	7.3%	20,733	92.6%
Freshwater Inflows	5%	88,526	39,033	44.1%	223	0.3%	49,356	55.8%
Coastal Prairies	30%	16,715	168	1.0%	532	3.2%	16,032	95.9%

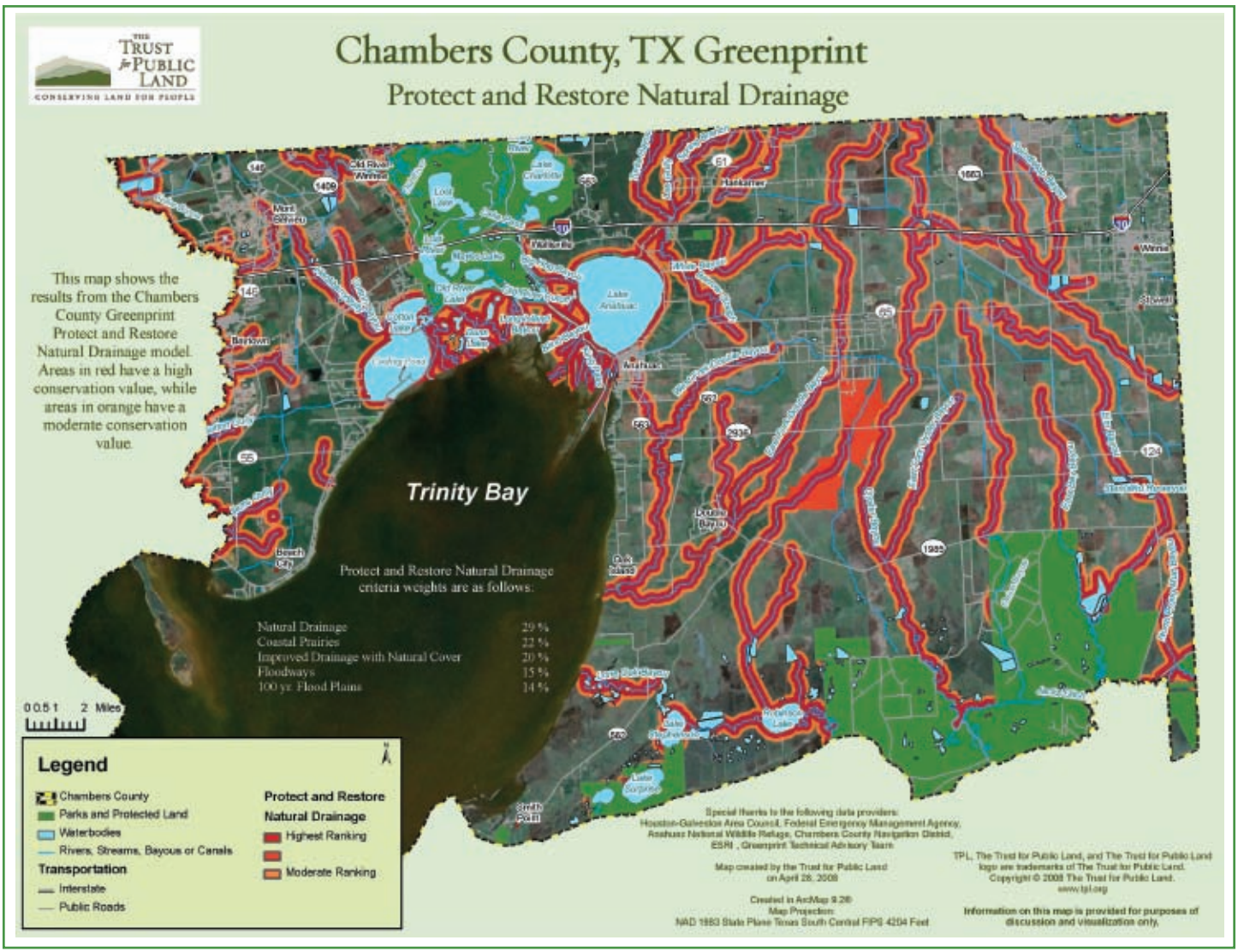
* The Study Area includes Chambers County land area (not including Trinity and Galveston bays)

** Developed Lands based on HGAC 2005 landcover

*** Protected Land includes all parkland

**** Priority lands score 3 or greater on a scale of 0–5 for the listed goal.

Table X: Protect Water Quality



Chambers County Greenprint Resource Profile Report

Chambers County, TX–May 9, 2008

GOAL: Protect and Restore Natural Drainage (5% of total weight)

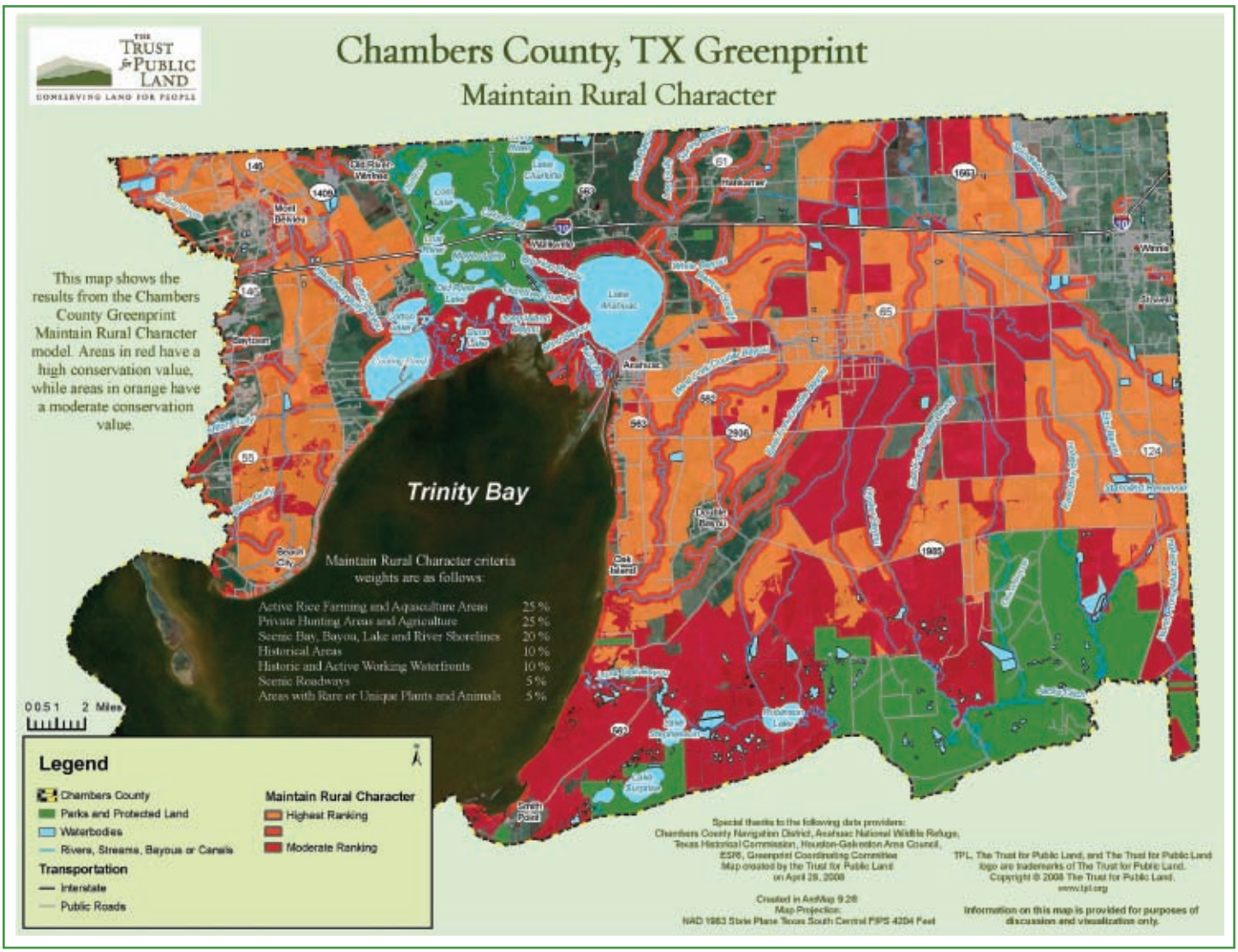
Total Study Area = 403,000 acres*; All Developed Land = 62,360 acres**; All Protected Land = 58,439 acres***

Goal	Goal Weight	Priority Acres****	Protected Priority Acres	% of Priority Acres	Developed Priority Acres	% of Priority Acres	Unprotected/ Undeveloped Priority Acres	% of Priority Acres
PROTECT AND RESTORE NATURAL DRAINAGE	100%	156,695	29,831	19.0%	7,094	4.5%	120,330	76.8%
Natural Drainage	29%	153,914	29,818	19.4%	7,059	4.6%	117,596	76.4%
Improved Drainage with Natural Cover	20%	54,590	6,108	11.2%	1,917	3.5%	46,685	85.5%
100 yr Flood Plains	14%	205,141	57,036	27.8%	5,582	2.7%	143,731	70.1%
Floodways	15%	4,464	2,131	47.7%	72	1.6%	2,288	51.3%
Coastal Prairies	22%	16,715	168	1.0%	532	3.2%	16,032	95.9%

* The Study Area includes Chambers County land area (not including Trinity and Galveston bays)
** Developed Lands based on HGAC 2005 landcover
*** Protected Land includes all parkland
**** Priority lands score 3 or greater on a scale of 0–5 for the listed goal.

Table XI: Protect and Restore Natural Drainage

Maintain Rural Character Map and Profile Report



Chambers County Greenprint Resource Profile Report

Chambers County, TX–May 9, 2008

GOAL: Maintain Rural Character (7% of total weight)

Total Study Area = 403,000 acres*; All Developed Land = 62,360 acres**; All Protected Land = 58,439 acres***

Goal	Goal Weight	Priority Acres****	Protected Priority Acres	% of Priority Acres	Developed Priority Acres	% of Priority Acres	Unprotected/ Undeveloped Priority Acres	% of Priority Acres
MAINTAIN RURAL CHARACTER	100%	304,052	33,527	11.0%	12,257	4.0%	258,880	85.1%
Active Rice Farming and Aquaculture Areas	25%	54,607	6,187	11.3%	1,501	2.7%	47,103	86.3%
Scenic Bay, Bayou, Lake & River Shorelines	20%	117,488	24,165	20.6%	5,097	4.3%	88,638	75.4%
Historical Areas	102%	1,431	102	7.1%	483	33.8%	874	61.1%
Historic and Active Working Waterfronts	10%	234	1	0.3%	47	20.3%	186	79.5%
Scenic Roadways	5%	14,065	887	6.3%	2,759	19.6%	10,640	75.6%
Areas with Rare or Unique Plants and Animals	5%	86,302	38,840	45.0%	2,945	3.4%	45,060	52.2%
Private Hunting Areas and Agriculture	25%	242,887	10,488	4.3%	8,434	3.5%	224,019	92.2%

* The Study Area includes Chambers County land area (not including Trinity and Galveston bays)

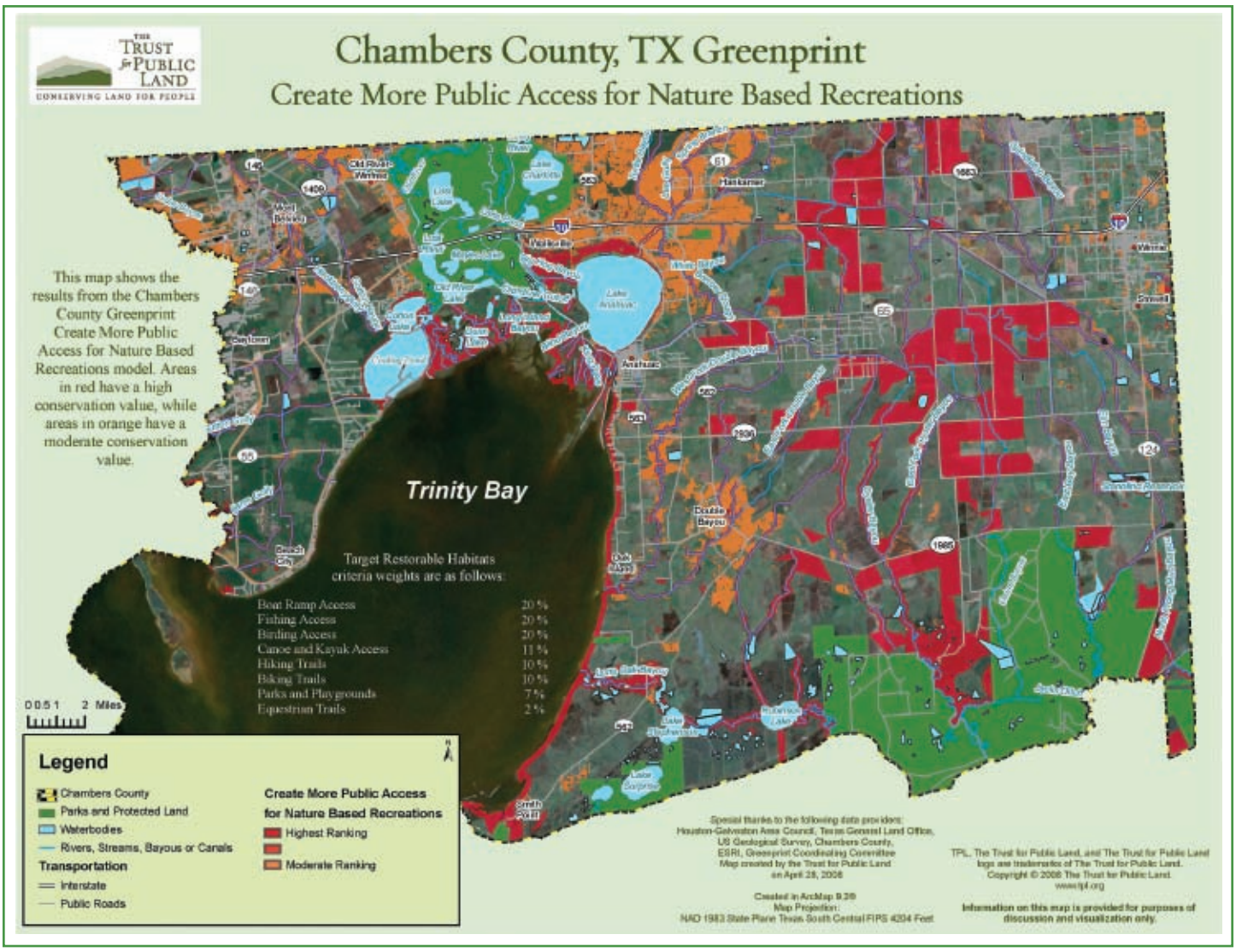
** Developed Lands based on HGAC 2005 landcover

*** Protected Land includes all parkland

**** Priority lands score 3 or greater on a scale of 0–5 for the listed goal.

Table XII: Maintain Rural Character

Create More Public Access for Nature-Based Recreation Map and Profile Report



Chambers County Greenprint Resource Profile Report

Chambers County, TX–May 9, 2008

GOAL: Create More Public Access for Nature-Based Recreation (2% of total weight)

Total Study Area = 403,000 acres*; All Developed Land = 62,360 acres**; All Protected Land = 58,439 acres***

Goal	Goal Weight	Priority Acres****	Protected Priority Acres	% of Priority Acres	Developed Priority Acres	% of Priority Acres	Unprotected/ Undeveloped Priority Acres	% of Priority Acres
CREATE MORE PUBLIC ACCESS FOR NATURE-BASED RECREATION	100%	150,642	36,892	24.5%	5,279	3.5%	109,349	72.6%
Fishing Access	20%	3,610	598	16.6%	878	24.3%	2,257	62.5%
Birding Sites	20%	115,283	33,630	29.2%	3,606	3.1%	78,858	68.4%
Hiking Trails	10%	39,774	4,488	11.3%	249	0.6%	35,076	88.2%
Canoe and Kayak Access	11%	4,854	649	13.4%	961	19.8%	3,381	69.6%
Boat Ramp Access	20%	384	138	35.8%	82	21.4%	206	53.6%
Parks and Playgrounds	7%	20,431	0	0.0%	7,869	38.5%	12,562	61.5%
Biking Trails	10%	3,889	223	5.7%	1,486	38.2%	2,263	58.2%
Equestrian Trails	2%	4,234	291	6.9%	105	2.5%	3,875	91.5%

* The Study Area includes Chambers County land area (not including Trinity and Galveston bays)

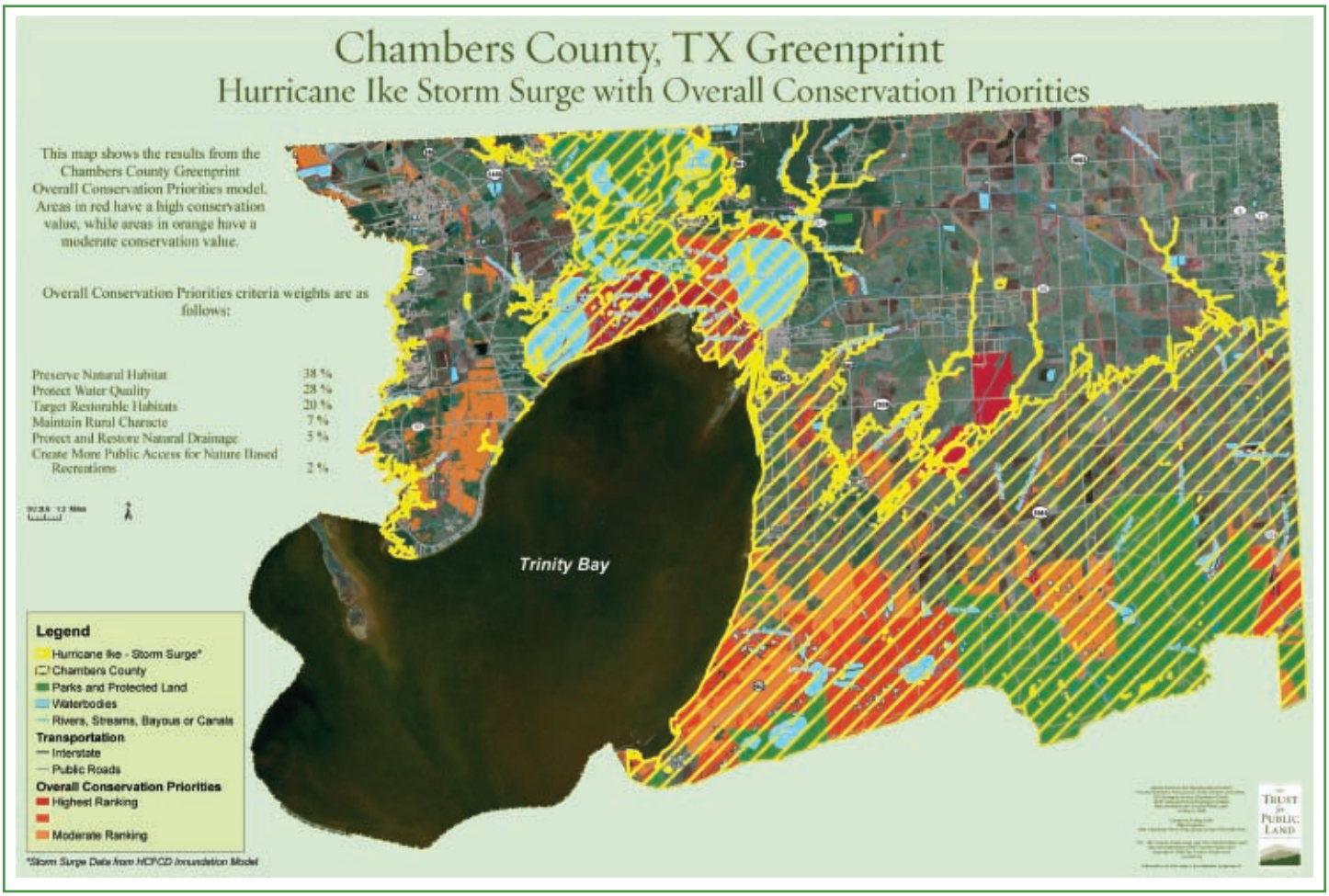
** Developed Lands based on HGAC 2005 landcover

*** Protected Land includes all parkland

**** Priority lands score 3 or greater on a scale of 0-5 for the listed goal.

Table XIII: Create More Public Access for Nature-Based Recreation

Hurricane Ike Storm Surge Map with Overall Conservation Priorities



Appendix A: Model Criteria Matrix

Chambers County, TX Greenprint

Model Criteria–May 8, 2008

Criteria	Weights	Methodology	Data	Data Source
Goal: Preserve Natural Habitat	***38%***			
Riparian Corridors	13%	Includes a 300-foot buffer along major waterways, perennial waterways, and intermittent streams.	Natural and Improved Waterways	TAT Markups (Matt Whitbeck and Bobby Hall) (2007)
			Streams and Rivers	ESRI (2006)
Flyway Corridors	2%	Includes a 300-foot buffer along the major rivers, streams, and bayous; a 1,000-foot buffer along the bay shoreline; and captures all marshes and agriculture areas	Perrenial Streams	USGS (2006)
			Streams and Rivers	ESRI (2006)
			Marsh Areas	NWI (2007)
			Active Agriculture and Aquaculture Areas	TAT Markup (Pudge Willcox)–active rice farm areas (2007)
Coastal Prairies	26%	Committee members created these known locations; Middleton prairie was ranked the highest, with the rest receiving a medium rank.	2007 Coastal Prairies	TAT Markups (Matt Whitbeck) (2007)
Oak Mottes	7%	Used local input to mark known locations.	2007 Oak Mottes	TAT Markups (Matt Whitbeck) (2007)
Cypress Swamps	19%	Used TPWD data to query known locations (Trinity River, Old River, Lost River, and Lake Charlotte area).	Cypress Swamps	TGLO (2007)
Marsh Areas	16%	Selected Estuarine & Palustrine Marsh from National Wetland Inventory data and ponds throughout southern portion of county were identified as marsh areas. The marshes in Coastal Prairies were removed so Coastal Prairie would not be double counted in this instance.	Marsh (Estuarine, Mangrove, Palustrine)	NWI (2007)
			Waterbodies	ESRI (2006)
			2007 Coastal Prairies	TAT Markups (Matt Whitbeck) (2007)
Important Native Plants and Animals	15%	Includes TPWD Threatened and Endangered Species data, with the removal of cordgrass, combined with Texas General Land Office Rookery Locations and coastal prairie locations, identified by the Technical Advisory Committee.	Rookeries	TX GLO (2007)
			Sensitive Coastal Habitats Or Species to Be Protected	TX GLO (2007)
			2007 Coastal Prairies	TAT Markups (Matt Whitbeck) (2007)
			Threatened & Endangered Species	TPWD (2008)
Maintain Diversity	2%	This used EPA TEAP (Texas Ecological Assessment Protocol) methodology, combined with data from the TPL GIS team. Four factors were included in this model: 1. Appropriateness of land cover (disturbance levels) 2. Unfragmented land–contiguous sizes of undeveloped land 3. Land cover diversity index (urgency measurement)–insufficiently protected unique habitats were ranked highest 4. Riparian corridors–with a 300-foot buffer.	2005 Land Cover 30 M–HGAC–refined with Greenprint groundtruthed results: - Coastal_Prairies - OakMottes - CypresSwamps - Marsh_Areas - Active_Agriculture - Former_Rice_Fields - Riparian Corridors	HGAC (2005) TPL (2008) TPL (2008) TPL (2008) TPL (2008) TPL (2008) TPL (2008) TPL (2008)
			Chamber County Roads	HGAC (2006)
			Parks and Protected Lands	TPL (2008)

Criteria Weighting Rationale: Historic and natural coastal prairie areas were assigned highest priority for the preservation of natural habitat within Chambers County. These areas are currently poorly protected and are rapidly diminishing due to development pressures. Moderate weights were assigned to riparian corridors, cypress swamp areas, marsh areas, and areas identified as supporting native plants and animals. Lower weight was assigned to Oak Motte areas because , except for those in riparian corridors, most of these sites have an anthropogenic origin and support lower priority wildlife species than the other habitats. This part of the chenier plain does not support the oak mottes that you find in Louisiana, but were mostly planted by early settlers around homesteads. Lowest weight was assigned to the diversity assessment, not because diversity is unimportant to maintaining habitat, but because the modeling approach used to evaluate this criterion was deemed unreliable. Lower weight was also assigned to flyway corridors, since these areas were already weighted under riparian corridors and marsh areas.

Table XIV: Chambers County Greenprint Model Criteria

Chambers County, TX Greenprint–Model Criteria

continued from previous page

Criteria	Weights	Methodology	Data	Data Source
Goal: Target Restorable Habitats	***20%***			
Former Rice Fields	31%	Targeted because of the potential habitat produced by restoring these habitats.	Former Rice Fields	TAC Markups (Pudge Willcox) (2007)
Other land that has been leveled and/or farmed or grazed.	18%	Targeted because of the potential habitat produced by restoring these habitats. This data captures crop (other than rice) and pasturelands.	Landcover Previously farmed areas	HGAC (2005) TAC Markups (Pudge Willcox) (2007)
Oil fields	15%	Oil and gas submerged leases were queried because of the potential for large, undisturbed, unfragmented land.	Oil and Gas Submerged Leases	TGLO (2007)
Constructed Reservoirs or Waterbodies	12%	Because of the functioning wetland habitats these constructed areas create, there would be a desire to keep these systems running.	NRG Cooling Pond	ESRI/TCEQ (2006/2007)
Shoreline Restoration	24%	Used Galveston Bay Habitat Conservation Blueprint data to target areas for potential restoration projects.	Conservation Blueprint	Galveston Bay Foundation (2007)
Criteria Weighting Rationale: Former rice fields and shoreline areas identified for restoration by the Galveston Bay Foundation Habitat Conservation Blueprint were considered highest priority for habitat restoration. All other criteria were assigned moderate weightings.				
Goal: Protect Water Quality	***28%***			
Riparian Buffers	30%	Includes a 300-foot buffer along major waterways, perennial waterways, and intermittent streams.	Natural and Improved Waterways Streams and Rivers	TAT Markups (Matt Whitbeck and Bobby Hall) (2007) ESRI (2006)
Wetlands	30%	Extracted wetland areas from the National Wetland Inventory data, excluding ditches, dikes, and farmlands.	2005 Land Cover 30 M–HGAC 2007 Active Rice Farms Canals, Ditches, Aqueducts	HGAC (2005) Pudge Willcox (2007) ESRI (2006)
Drinking Water Sources	5%	Used EPA Drinking Surface Source Water data.	Surface Water Intake Locations	EPA (2005)
Freshwater Inflows	5%	Used HGAC 2005 land cover data and queried Estuarine Emergent Wetlands and Palustrine Emergent Wetlands, as those most important for protecting freshwater inflows.	2005 Land Cover 30 M–HGAC	HGAC (2005)
Coastal Prairies	30%	Committee members created these known locations; Middleton Prairie was ranked the highest, with the rest receiving a medium rank.	2007 Coastal Prairies	TAT Markups (Matt Whitbeck) (2007)
Criteria Weighting Rationale: Relative weights for these criteria do not necessarily reflect importance of the resource, but rather the accuracy and comprehensiveness of the underlying datasets. Available GIS data that identifies freshwater inflows and drinking water sources within the County were deemed to be relatively inaccurate and therefore these two criteria were weighted much lower.				

Table XIV: Chambers County Greenprint Model Criteria–*continued*

Chambers County, TX Greenprint–Model Criteria

continued from previous page

Criteria	Weights	Methodology	Data	Data Source
Goal: Maintain Rural Character	***7%***			
Active Rice Farming and Aquaculture Areas	25%	Identified crawfish farms, rice farms (without coastal prairie), and private lands with freshwater waterbodies.	2007 Duck Water	TAT Markup (Pudge Willcox)–denoting duck water areas (2007)
			2007 Active Rice and Crawfish Farms	TAT Markup (Pudge Willcox)–active rice farm areas (2007)
			2007 Coastal Prairies	TAT Markups (Matt Whitbeck)–Coastal Prairies (2007)
Scenic Bay, Bayou, Lake & River Shorelines	20%	Buffered all major streams, waterbodies, and bay shorelines by 1,000 feet.	Streams and Rivers	ESRI/StreetMap (2006)
			Streams, Rivers, Lakes, Ponds, Reservoirs	ESRI/StreetMap (2006)
Historical Areas	10%	Used historical marker data from the Texas Historical Commission, with a 300-foot buffer applied to these locations.	Historical Markers	Texas Historical Commission (2007)
Historic and Active Working Waterfronts	10%	Using 15 locations provided by the TPL Houston office, a 500-foot buffer is created around these locations.	WorkingWaterfronts	TPL Houston (2008)
Scenic Roadways	5%	Includes road segments identified by Coordinating Committee as scenic; a 1,000-foot buffer is applied to these locations.	Scenic Roadways	Identified by Coordinating Committee (2007)
Areas with Rare or Unique Plants and Animals	5%	Includes TPWD Threatened and Endangered Species data, with the removal of cordgrass, combined with Texas General Land Office Rookery Locations and coastal prairie locations, identified by the Technical Advisory Committee.	Rookeries	TX GLO (2007)
			Sensitive Coastal Habitats or Species to be Protected	TX GLO (2007)
			2007 Coastal Prairies	TAT Markups (Matt Whitbeck) (2007)
			Threatened & Endangered Species	TPWD (2008)
Private Hunting Areas and Agriculture	25%	Combined irrigated lands for water fowl, former rice farms, marsh , active rice farms, and coastal prairie–removing any areas within Anahuac National Wildlife Refuge.	2007 Duck_Water	TAT Markup (Pudge Willcox)–denoting duck water areas (2007)
			2007 Active Rice Farms	TAT Markup (Pudge Willcox)–active rice farm areas (2007)
			CoastalPrairies_TAT_Markups_7dec07	TAT Markups (Matt Whitbeck)–Coastal Prairies (2007)
			FormerRice	TAT Markup (Pudge Willcox)–active rice farm areas (2007
			AnahuacNationalWildlifeRefuge	TPL Houston Office (2007)
			2005 Land Cover 30 M–HGAC	HGAC (2007)

Criteria Weighting Rationale: Criteria that reflect agricultural areas were weighted highest for this goal. Agriculture is the major defining characteristic of rural character in Chambers County and maintaining these areas in active agriculture provides habitat for wildlife that are distinct to the rural character of the County. Most agricultural areas are also under private ownership, and thus tend to be vulnerable to development pressures. Shorelines and waterfront vistas were also weighted high because of their scenic value. Historic areas and scenic roadways were ranked lower because these areas are either publicly owned or already receive some level of protection from the state. In addition, the high level of weighting on agricultural areas will also give weight to this aspect of scenic roadways.

Table XIV: Chambers County Greenprint Model Criteria–*continued*

Chambers County, TX Greenprint–Model Criteria

continued from previous page

Criteria	Weights	Methodology	Data	Data Source
Goal: Protect and Restore Natural Drainage	***5%***			
Natural Drainage	29%	Used a revised hydrologic layer created by committee members that identifies natural waterways; a 300-foot buffer was be included.	Natural and Improved Waterways Streams and Rivers	TAT Markups (Matt Whitbeck and Bobby Hall) (2007) ESRI (2006)
Improved Drainage with Natural Cover	20%	Used a revised hydrologic layer created by committee members that identifies natural waterways. This data was intersected with natural cover data and given a 300-foot buffer.	Natural and Improved Waterways Streams and Rivers 2005 Land Cover 30 M–HGAC	TAT Markups (Matt Whitbeck and Bobby Hall) (2007 ESRI (2006) HGAC (2005)
100 yr Floodplains	14%	Used FEMA classification for the 100-year floodplain.	Floodplains	FEMA Q3 (2007)
Floodways	15%	Used FEMA Floodway data and provided a 30-foot buffer for streams that did not provide the stream width.	Streams and Rivers Floodways	ESRI (2006) FEMA Q3 (2007)
Coastal Prairies	22%	Committee members created these known locations; Middleton prairie was ranked the highest, with the rest receiving a medium rank.	2007 Coastal Prairies	TAT Markups (Matt Whitbeck) (2007)

Criteria Weighting Rationale: Natural drainage riparian corridors were weighted highest for this goal, along with Coastal Prairies, since these areas best characterize the intent of this goal. Improved riparian corridors that exhibit natural cover were weighted moderately high, for the filtering opportunities provided by the natural cover. Floodplains and floodways were weighted lowest, since these areas receive regulatory protection with regard to development.

Table XIV: Chambers County Greenprint Model Criteria–*continued*

Chambers County, TX Greenprint–Model Criteria

continued from previous page

Criteria	Weights	Methodology	Data	Data Source
Goal: Create More Public Access for Nature-Based Recreation	***2%***			
Fishing Access	20%	Located all areas, of at least one acre in size, that are within 250 feet of the bay shoreline, major lake, or navigable stream, and have access via a public roadway (including bridges, dead ends, and roadways along streams).	Canoe and Kayak Potential Access Points	GLO and USGS (2007) Generated by TPL Houston Office (2007)
			Public Roadways	ESRI (2006)–Edited by TPL
			Streams and Rivers	ESRI (2006)
			Bay Shoreline	TPLGIS (2007)
			2005 Land Cover 30 M–HGAC	HGAC (2007)
Birding Sites	20%	Identified diverse bird habitat areas that are within 3/4 mile of public roads or 1/8 mile of navigable streams (including Candy Cain Abshier WMA, riparian corridors, flyway corridors, and other areas identified by the Coordinating Committee).	CANDY ABSHIER WMA	GLO (2007)
			Streams and Rivers	ESRI (2006)
			Birding Sites: Double Bayou Park and White Memorial Park	TPLGIS (2008)
Hiking Trails	10%	Located shaded areas of riparian corridors that are at least five acres in contiguous size, but excluding areas of tallow cover.	2005 Land Cover 30 M	HGAC (2005)
			Hiking Trails	TPL Houston Office (2007)
Canoe and Kayak Access	11%	Located all areas, of at least one acre in size, that are within 250 feet of a navigable stream, and have access via a public roadway (including bridges, dead ends, and roadways along streams).	Canoe and Kayak Potential Access Points	GLO and USGS (2007) Generated by TPL Houston Office (2007)
			Public Roadways	ESRI (2006)–Edited by TPL
			Streams and Rivers	ESRI (2006)
			2005 Land Cover 30 M–HGAC	HGAC (2007)
Power Boat Access	20%	Located all areas, of at least one acre in size, that are within 250 feet of a large lake or the bay shoreline, and have access via a public roadway (including bridges, dead ends, and roadways along streams). Eliminated areas along the bay that are too steep for ramp construction.	Power Boat Potential Access Points	Generated by TPL Houston Office
			Steep Bay Shorelines	TPL Houston Office (Coordinating Comm. Markups) (2008)
			Public Roadways	ESRI (2006)–Edited by TPL
Parks and Playgrounds	7%	Use landcover to identify populated areas. Anticipated growth around these areas was simulated with 1/4-mi, 1/2-mi, and 3-mi buffers (consistent with Parks and Rec Master plan). Included areas outside the study area to accommodate growth across county lines.	Chambers Parks	TPL–using parks inventory map from Public Management, Inc. (2007)
			2005 Land Cover 30 M	HGAC (2005)
			Interstate Highways	ESRI 2006
Biking Trails	10%	Scenic roadways identified by the Coordinating Committee as being ideal for biking, because of esthetics and logistics. Includes a 180-foot corridor along all routes.	BikeTrails	TPL Houston Office (Coordinating Comm. Markups) (2008)
Equestrian Trails	2%	Includes a 300-foot buffer of areas along bayous–Oyster, Turtle, Double (East and West Forks).	Streams and Rivers	ESRI (2006)

Criteria Weighting Rationale: In considering creation of more public access to nature-based recreation, fishing and boating were weighted highest because of their historic significance as major recreation activities in the County. Birding was also weighted high as a key opportunity to create additional recreation opportunities. Canoe, kayak, hiking, and biking were weighted moderately high as additional opportunities to create new recreation access. Parks and Playgrounds were weighted lower, since the focus of this goal was on Nature-Based recreation. Equestrian trails were weighted lower than the other criteria because a demand for additional trails has not been demonstrated at this time.

Table XIV: Chambers County Greenprint Model Criteria–*continued*

Appendix B: Greenprint Committees and Assistance

(Some affiliations may have changed since participation in the project.)

Chambers County Commissioners' Court

Hon. Jimmy Sylvia, *Chambers County Judge*

Hon. Mark Huddleston, *Chambers County Commissioner, Precinct One*

Hon. David "Bubba" Abernathy, *Chambers County Commissioner, Precinct Two*

Hon. Gary Nelson, *Chambers County Commissioner, Precinct Three*

Hon. Bill Wallace, *Chambers County Commissioner, Precinct Four*

Coordinating Committee

Tag Anderson, *Commercial Hunting and Fishing Guide**

Sarah Cerrone, *Chambers County*

Amy Hill Turner, *Waterborne Education Center**

Bob Nailon, *Entrix*

Hon. Guido Persiani, *Site Development Consultant for Bayer and Mayor of Beach City**

Bob Scherer, Jr., *Chambers County*

Eddie Seidensticker, *Natural Resources Conservation Service**

Michele Whitbeck, *Anahuac National Wildlife Refuge*

Pudge Willcox, *Chambers-Liberty Counties Navigation District**

Technical Advisory Committee

Kris Benson, *National Oceanic & Atmospheric Administration*

Don Brandon, *Chambers County**

Sarah Cerrone, *Chambers County**

Tim Cooper, *Anahuac National Wildlife Refuge**

Jim Dobberstine, *Galveston Bay Foundation*

Bobby Hall, *Surveyor**

Steven Johnston, *Galveston Bay Estuary Program*

Ruth Millsaps, *U.S. Army Corps of Engineers**

Eddie Seidensticker, *Natural Resources Conservation Service**

Matt Whitbeck, *Anahuac National Wildlife Refuge*

Scott Williams, *U.S. Fish & Wildlife Service*

Heather Young, *National Oceanic & Atmospheric Administration*

Other Technical Assistance

Tag Anderson, *Chambers County*

Bill Bass, *Houston-Galveston Advisory Council*

Phil Bedient, *Rice University*

Kris Benson, *National Oceanic & Atmospheric Administration*

Don Brandon, *Chambers County*

Sarah Cerrone, *Chambers County*

Jeff DallaRosa, *Galveston Bay Estuary Program*

Winston Denton, *Texas Parks & Wildlife Department*

Judy Edmonds, *former Chambers County Commissioner*

Robert Gatlin, *Texas A&M University*

Lisa Gonzales, *Houston Advanced Research Center*

Bobby Hall, *retired county surveyor*

Patrick Horton, *Houston-Galveston Area Council*

Hon. Mark Huddleston, *Chambers County Commissioner, Precinct One*

Steven Johnston, *Galveston Bay Estuary Program*

Terrie Looney, Texas *AgriLife Extension*

Missy Malechek, *West Chambers County Chamber of Commerce*

Carl Masterson, *Houston-Galveston Area Council*

Marina Muñoz, *Chambers County*

Bob Nailon, *Entrix*

Doris Nelson, *Fisherman's Harvest*

Hon. Gary Nelson, *Chambers County Commissioner, Precinct Three*

Rebecca Olive, *TCB*

Walter Peacock, *Texas A&M University*

Hon. Guido Persiani, *Beach City Mayor*

Ben Rhame, *Texas General Land Office*

Todd Running, *Houston-Galveston Area Council*

Bob Scherer, Jr., *Chambers County*

William Seitz, Ph.D., *Texas A&M Galveston*

Eddie Seidensticker, *Natural Resources Conservation Service*

Jerry Sparks, *Chambers County*

Mary Beth Stengler, *Chambers-Liberty Counties Navigation District*

Carlos Swonke, *TCB*

Amy Hill Turner, *Waterborne Education Center*

Natalie Wiest, *Houston Canoe Club*

Matt Whitbeck, *Anahuac National Wildlife Refuge*

Michele Whitbeck, *Anahuac National Wildlife Refuge*

Mary Ellen Whitworth, *Bayou Preservation Association*

Hon. Carroll Wilborn, Jr., *Chambers County*

Pudge Willcox, *Chambers-Liberty Counties Navigation District*

Scott Williams, *U.S. Fish & Wildlife Service*

Heather Young, *National Oceanic & Atmospheric Administration*

Rosie Zamora, *Houston Wilderness*

Strategy Exchange Team

Amy Condon, *The Trust for Public Land*

Amos Cooper, *Texas Parks & Wildlife Department*

Kristina Hardwick, *Houston-Galveston Area Council*

Miles Phillips, *Texas AgriLife Extension Service*

Bob Randall, *Urban Harvest*

Monique Slaughter, *Texas Parks & Wildlife Department*

Will Abberger, *The Trust for Public Land*

Local Exchange Week Presenters, Tour Leaders, and Assistants

Carla Anderson, *Chambers County*

Tag Anderson, *Chambers County*

Sarah Cerrone, *Chambers County*

Debbie Figueras-Cano, *Waste Management, Inc.*

Hon. Guy Robert Jackson, *Mayor of Anahuac*

John Jenkins, *rice farmer*

Lagow Family, *ranchers*

Leon Langley, *rice farmer*

Dede Laskoski, *Chambers County*

Richard Long, *U.S. Army Corps of Engineers*

Jacquie Miller, *Urban Harvest*

Ruth Millsaps, *U.S. Army Corps of Engineers*

Fritz Nelius, *Natural Resources Conservation Service*

Hon. Guido Persiani, *Bayer and Mayor of Beach City*

Shaun Sanchez, *Anahuac National Wildlife Refuge*

Eddie Seidensticker, *Waterborne Education Center*

Michael Shields, *West Chambers County Economic Development Foundation*

Volunteers and Staff, *Waterborne Education Center*

Craig Weeks, *U.S. Environmental Protection Agency Region 6*

Michele Whitbeck, *Anahuac National Wildlife Refuge*

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Smitty Smith, *GIS Program Coordinator, Santa Fe, NM*

Holli Swick, *Program Associate, Coastal & Southeast Texas Office, TX*

Laura Sykes, *Project Manager, Coastal & Southeast Texas Office, TX*

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*Also served on the combined Greenprint Committee

Appendix C: Strategy Exchange Week Schedule

Monday, May 12, 2008

TEAM ARRIVALS

3:00—5:00 p.m. ORIENTATION OF EXCHANGE TEAM
Location: American Legion Hall, Fort Anahuac Park

5:00—6:30 p.m. TEAM MEAL
Location: Al T's
Sponsor: Rice Festival & Gator Fest

7:00—9:00 p.m. ALTERNATIVE CROPS FOR INCOME DIVERSIFICATION ROUNDTABLE
Team Lead: Dr. Bob Randall, *founder of Urban Harvest*
Local Lead: Leon Langley, *organic rice farmer*
Hon. Gary Nelson, *Chambers Co. Commissioner*
Location: American Legion Hall, Fort Anahuac Park

LODGING
Location: Oak Island Lodge

Tuesday, May 13, 2008

8:00 a.m. TEAM MEAL
Location: Oak Island Lodge
Sponsor: Turtle Bayou Landing

8:30—12:00 p.m. VAN TOUR
Transportation: Chambers County
Guides: Michael Shields, *West Chambers Co. Economic Development Foundation*
Michele Whitbeck, *Anahuac National Wildlife Refuge*
John Jenkins, *rice farmer*

12:30—1:30 p.m. TEAM MEAL
Location: Corp of Engineers Visitor Center
Sponsor: Anahuac Area Chamber of Commerce

1:30—3:30 p.m. BOAT TOUR
Location: Corp of Engineers Wallisville Visitor Center
Guides: Russell Long, *U.S. Army Corps of Engineers*
Ruth Millsaps, *U.S. Army Corps of Engineers*
Eddie Seidensticker, *Waterborne Education Center*
Transportation: Waterborne Education Center

5:30—6:30 p.m. TEAM MEAL
Location: Nopalito's
Sponsor: Speer Properties

7:00—9:00 p.m. WILDLIFE-BASED INCOME DIVERSIFICATION ROUNDTABLE
Team Leads: Miles Phillips, *Texas A&M University*
Amos Cooper, *Texas Parks and Wildlife Dept.*
Monique Slaughter, *Texas Parks and Wildlife Dept.*
Local Leads: Lagow Family, ranchers
Location: American Legion Hall, Fort Anahuac Park

LODGING
Location: Oak Island Lodge

Wednesday, May 14, 2008

8:00 a.m. TEAM MEAL
Location: Oak Island Lodge
Sponsor: West Chambers County Chamber of Commerce

10:00—12:00 a.m. CONSERVATION FUNDING ROUNDTABLE
Team Lead: Will Abberger, *The Trust for Public Land*
Local Leads: Hon. Guy Robert Jackson, *Mayor of Anahuac*
Shaun Sanchez, *Anahuac National Wildlife Refuge*
Hon. Bill Wallace, *Chambers Co. Commissioner*
Location: Bayer

12:30—1:30 pm. BENEFICIAL USES/LUNCH
Speaker: Eddie Seidensticker, *Natural Resources Conservation Service*
Sponsor: Bayer

2:00—4:00 p.m. CONSERVATION OF CORPORATE LANDS ROUNDTABLE
Team Lead: Kristina Hardwick, *Houston-Galveston Area Council*
Local Lead: Guido Persiani, *Bayer*
Speakers: Debbie Figueras-Cano, *Waste Management, Inc.*
Craig Weeks, *U.S. EPA Region 6*
Location: Bayer

5:30—6:30 p.m. TEAM MEAL
Location: Winnie Pizza Hut
Sponsor: Winnie Chamber of Commerce

8:00—10:00 p.m. REPORT WRITING & LODGING
Location: Oak Island Lodge

Thursday, May 15, 2008

8:00 a.m. TEAM MEAL
Location: Oak Island Lodge
Sponsor: West Chambers County Chamber of Commerce

9:00 a.m.—5:00 p.m. REPORT WRITING & LUNCH
Location: EcoCenter
Sponsor: NRG Energy

6:30—9:00 p.m. PUBLIC PRESENTATION/ RECEPTION
Location: American Legion Hall, Fort Anahuac Park

LODGING
Location: Spoonbill Lodge

TEAM DEPARTURES

THE TRUST *for* PUBLIC LAND

TEXAS

The Trust for Public Land
Texas State Office
816 Congress Avenue
Suite 1680
Austin, TX 78701

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