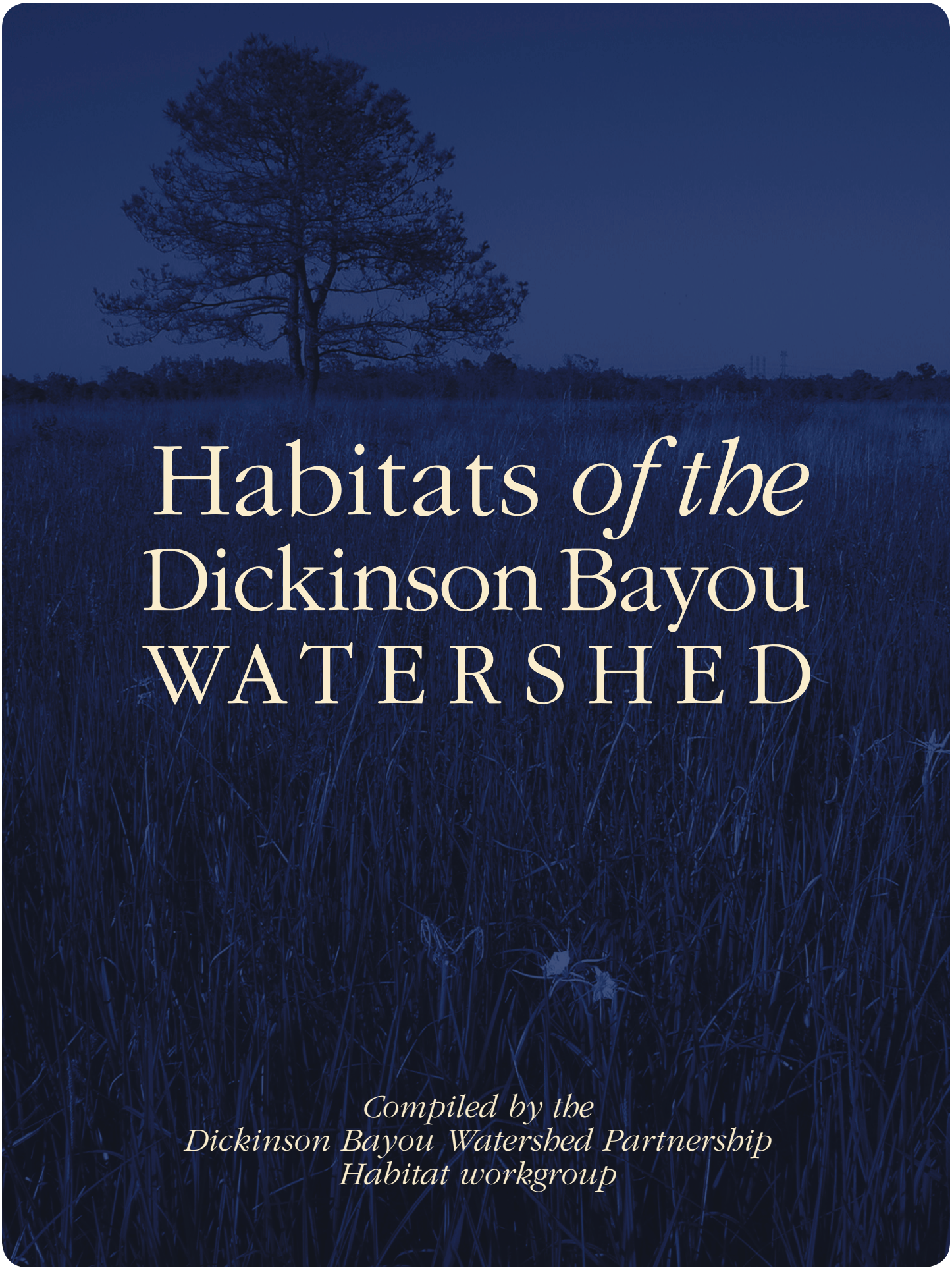

Habitats *of the* Dickinson Bayou WATERSHED

Compiled by the
Dickinson Bayou Watershed Partnership
Habitat workgroup

Acknowlegments

Many thanks to the members of the Habitat Work Group for their efforts throughout the process of creating this document. The Habitat Work Group includes:

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INTRODUCTION

The Dickinson Bayou watershed lies between Houston and Galveston, Texas and encompasses a variety of habitats, including prairies, forests, wetlands, streams and bays. The Dickinson Bayou watershed community faces the challenge of supporting on-going and future development while improving water quality to meet the designated uses for the region which include water-related recreational activities. This is coupled with the challenge of maintaining habitat integrity within the watershed to support the flora and fauna native to the region.

Schematic showing Dickinson Bayou watershed in relation to Galveston Bay and Houston

Many changes to the seven habitats (as described in the Houston-Galveston Area Council, Land Use/Land Cover map, Appendix A) have occurred in the watershed since the land use cover map was generated. Year 2005 aerial photography (National Agricultural Imagery Program, 2005) of the watershed shows increasing fragmentation of the prairie, forest and wetland habitats by agriculture and urban development. Additionally, the effects of created freshwater canals across grasslands or former prairie habitat to move water to Dickinson Bayou have not yet been evaluated, and may represent significant impacts on hydrology and habitat structure. Increased land clearing has removed scrub shrub habitat further destabilizing stream banks and increasing sediment loss into the bayou.

The purpose of this document is to identify and describe the various remaining habitats, as well as, identify future habitat restoration goals for the watershed.

Prairies and Grasslands

The Dickinson Bayou watershed lies within the Gulf Coast Prairies and Marshes eco-region. The coastal prairie ecosystem of Texas and Louisiana is one of the most critically threatened in the world. Once covering over 9 million acres of land, more than 99% of coastal prairies have been lost through conversion to agriculture, grazing land, and urban areas. Remaining coastal prairie parcels are highly fragmented and still severely threatened by encroaching development and invasive, non-native species.

Aerial view of prairie potholes within the watershed

The coastal prairie is similar to the tallgrass prairie of the Midwestern United States, due to their common forbs and grasses. However, the Texas coastal prairie ecosystem rests upon unique heavy clay soils (Lissie and Beaumont Geologic formations) and endures periods of heavy rainfall with similar periods of drought. This climate and soil conditions coupled with the historic disturbances from wild fires and high intensity, low duration grazing from the American bison created the Texas coastal prairies which remain within the Dickinson Bayou watershed. (Smeins and Diamond, 1983; U.S. Fish and Wildlife Service and U.S. Geologic Science, 1999).

Plants commonly found on these prairies include grasses such as Brownseed paspalum (*Paspalum plicatulum*), little bluestem (*Schizachyrium scoparium)*, indiangrass (*Sorghastrum nutans*), eastern gammagrass (*Tripsacum dactyloides*), and switchgrass (*Panicum virgatum*), along with wildlflowers such as prairie coneflowers (*Ratibida* spp.), aster (*Aster* spp.), and the rare coastal gayfeather (*Liatris bracheata*). Conversion of land use (e.g. agriculture, cattle grazing), invasion of exotic species (e.g. Chinese tallow), and interruption of the natural cycles of fire and grazing has threatened most of these plant species. Over a dozen plants in the ecosystem are considered "state-rare", with two others considered "critically imperiled". (Gould 1975; Grace et.al. 2000)

The coastal prairie is also the only place to find the federally endangered Attwater's prairie chicken, a rare subspecies of the Greater prairie chicken with fewer than 50 individuals remaining in the wild. Likewise, it is the only home for Prairie Dawn (*Hymenoxys texana*) and Texas Windmill grass (*Chloris texensis*). Similarly, coastal prairie remains key habitat for Mottled Ducks (*Anas fulvigula*), and feeding habitat for wading birds, hawks, and sparrows including: Solitary Sandpiper (Tringa solitaria), Wilson's Snipe (*Gallinago gallinago*), White-tailed Hawks (*Buteo albicaudatus*), Northern Harrier (*Circus cyaneus*), White-tailed Kite (*Elanus leucurus*), American Kestrel (*Falco saprverius*), Le Conte's, Field, Henslow's and Vesper Sparrow (*Ammodramus leconteii*, *Spizella pusilla*, *Ammodramus henslowii*, and *Pooecetes gramineus*).

Exotic invasion of coastal prairie habitat represent a major threat, significantly altering and damage native habitats. Chinese Tallow (*Triadica sebifera*), a particularly pervasive and aggressive exotic, was purposely introduced into the southeastern United States as early as the 1700s, primarily for ornamental landscape use. This tree is now

found throughout the watershed and invades prairie habitat.

Deep rooted sedge (*Cyperus entrerianus*), another aggressive non-native plant, is found within the watershed and invades prairie habitat areas including disturbed and remnant areas, and areas where development has cleared the land, leaving open spaces for seed propagation.

Despite the widespread loss of much of these habitats and organisms of the coastal prairie ecosystem, there remains much biodiversity worth protecting. Some of the best prairie remnants and extensive prairie lands occur in the Dickinson Bayou watershed.

Please refer to **Appendix B** for complete list of protected plant species.

Wetlands

The Dickinson Bayou watershed like many watersheds within the Galveston Bay region includes a variety of wetland habitats. These lands perched between the upland and the open waters of Dickinson Bayou, its contributing tributaries, or Dickinson Bay, are critical habitats for pollution abatement. For Dickinson Bayou, these qualities are especially important, as the bayou is classified as an impaired waterbody. Therefore, any restoration of wetlands would potentially enhance or restore some water quality and habitat functions within the watershed.

Moulton and Jacob (2000) in their "Texas Coastal Wetland Guidebook" report the Dickinson Watershed is located in the "Prairie Pothole" Beaumont Soil region. These wetlands were historically coastal prairie wetlands with palustrine scrub-shrub, palustrine forested, and palustrine emergent wetlands in the upper reaches of the watershed where it drains into Dickinson Bayou; and emergent tidal wetlands in the lower regions of the watershed as it drains into Dickinson Bay and eventually Galveston Bay. The "Trends and Status of Wetland and Aquatic Habitats in the Galveston Bay System, Texas" (White et. al. 1993) also reports the Dickinson watershed wetlands were historically characterized as mostly palustrine scrub-shrub, palustrine emergent, and palustrine forested wetlands in the upper portions of the watershed, and estuarine emergent wetlands in the lower portions.

Palustrine systems as defined by Cowardin *et al.* (1991) include "all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens and all such wetlands that occur in tidal areas where salinity due to ocean derived salts are below 0.5%." Palustrine wetlands in the Dickinson Bayou watershed include low lying moist areas where precipitation and stormwater runoff accumulate before being released back into Dickinson Bayou and eventually Dickinson Bay. These low lying areas are primarily influenced by rainfall, and to a lesser extent from hurricanes and

tropical disturbances. During extreme flooding conditions, both palustrine and estuarine wetlands serve as important buffers or detention basins for the Dickinson Bayou watershed.

Palustrine scrub-shrub in this watershed are dominated by shrub-like vegetation Senna bean (*Sesbania drummondii*) and smaller trees such as yaupon (*Ilex vomitoria*) and cedar elm (*Ulmus crassifolia)*, which do not develop into large, mature forests (White *et. al.* 1993). As with many areas around Galveston Bay, these scrub-shrub areas are also often overgrown with invasive tree species planted by private landowners such as Chinese tallow tree (*Triadica sebifera*), Chinese privet (*Ligustrum sinense*), Japanese privet (*Ligustrum japonicum*). These ornamental shrubs and trees have displaced the native trees and shrubs which provide habitat value and stability to the slopes and banks of Dickinson Bayou.

Palustrine emergent wetlands are characterized by the presence of grassy vegetation, such as Marsh-hay cordgrass (*Spartina patens*), arrowheads (*Sagittaria* spp.) and square-stem spikerush (*Eleocharis quadrangulata*).

Estuarine wetlands are brackish to saline systems which are affected by tidal influences and salinity regimes. Plant communities are characterized by more salt-tolerant species including: salt marsh cordgrass (*Spartina alterniflora*) in lower areas, and Marsh-elder (*Iva frutescens*) along higher areas of the bank. However, several species which may be found in palustrine settings can also tolerate brackish marsh conditions, such as Marsh hay cordgrass (*Spartina patens*), bulrushes (*Scirpus* spp.) and square-stem spikerush (*Eleocharis quadrangulata*).

Typical view of Dickinson Bayou, scrub-shrub wetland on the left; estuarine wetlands below.

Created and restored wetlands receive a special note. Restored wetlands are areas where wetland values and functions once existed, were altered by development or other impact and restored to pre-impact/pre-development conditions. Created wetlands are areas that were not previously classified or identified as wetlands, and are converted to wetland habitat. Many examples of both wetlands are available outside the watershed. At the time of publication, there are few examples to cite for restoration or creation within the Dickinson Bayou watershed.

Riparian Forests and Coastal Flatwoods

The forested areas of Dickinson Bayou watershed lie primarily along the riparian corridor of the bayou and its tributaries. The riparian corridor for sections of Dickinson Bayou contain larger complexes of upland forests intermingled with lower lying riparian forested wetlands or coastal flatwoods.

These riparian corridors are dominated by a variety of vegetation, including cedar elm (*Ulmus crassifolia*), willow oak (*Quercus phellos*), and black willow

Infared aerial view of forested riparian corridor along Dickinson Bayou

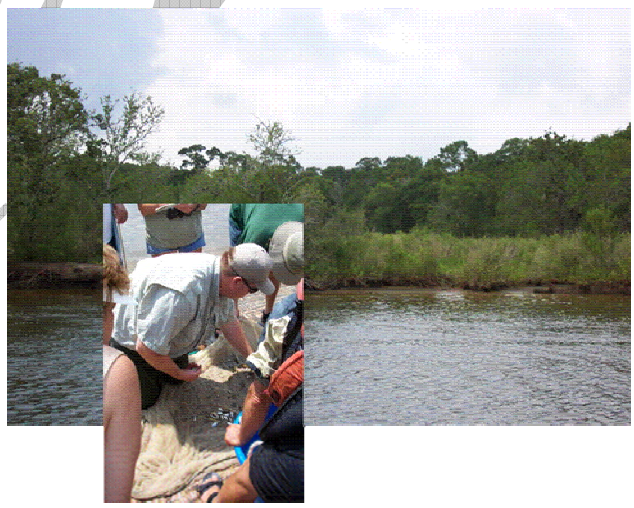
(*Salix nigra*) along the banks. Upland forests along higher elevations in this same corridor are characterized by live oak (*Quercus virginiana*), Loblolly pine (*Pinus taeda*), Eastern red cedar (*Juniperus virginiana*) and green ash (*Fraxinus pennsylvanica*). Understory ground cover may include upland species like American beautyberry (*Callicarpa americana*) and yaupon (*Ilex vomitoria*). Wetland species such as spiderwort (*Tradenscancia ohiensis*) and palmetto (*Sabal minor)* also contribute to the understory vegetation in these corridors.

See **Appendix C** for a comprehensive list of tree species found within the watershed.

Examples of a typical channel view of the Bayou, upper reaches.

Aquatic Habitats

Aquatic habitats can be categorized into oceans, bays, bayous, rivers, stream, and lakes (Cowardin 1991). Dickinson Bayou represents a major aquatic habitat type in the watershed. It is generally characterized as a slow moving body of water that supports riparian forests and both riverine and estuarine emergent wetland habitats.



TPWD employee identifying fish from a seine sample

According to a U.S. Geological Survey report (East, 2000) Dickinson Bayou is approximately 25 miles southeast of Houston, and about 24 river miles long. Dickinson Bayou flows east towards Dickinson Bay, a secondary bay of the Galveston Bay ecosystem. Dickinson Bayou is part of the San Jacinto Brazos Coastal Basin and comprises two stream segments as defined by Texas Commission on Environmental Quality (TCEQ). Stream segment 1104 is Dickinson Bayou above tidal reach which flows 7.3 miles from FM 528 to 1.2 miles downstream of FM 517. Segment 1103 is the Dickinson Bayou tidal reach which starts 1.2 miles downstream of FM 517 and flows 16.4 miles to the Dickinson Bayou confluence with Dickinson Bay. Flow regimes in the two reaches are markedly different. The above tidal reach is a relatively narrow, shallow stream (1 to 3 ft deep) with moderate to slow moving water, whereas the tidal reach is a wider, predominantly deep channel (5 to 20 ft deep) with very sluggish flow.

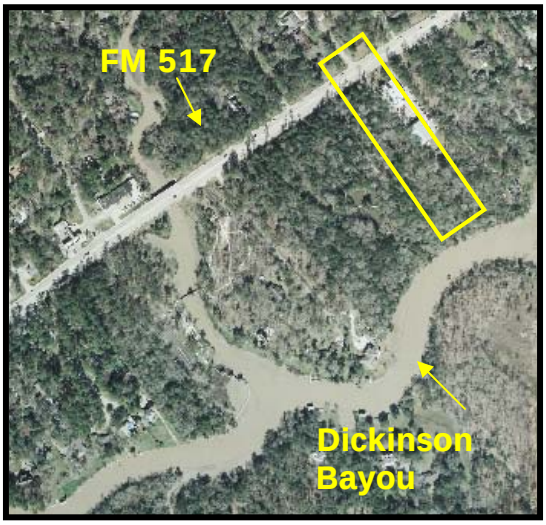
Streamside vegetation is characteristic of the two stream segments flow regimes. The above tidal reach is characterized by dense riparian vegetation that limits sunlight exposure whereas vegetation in the tidal reach is less dense and allows more exposure to sunlight. The topography of the watershed slopes gently towards the bayou. Land-surface altitude varies from about 50 feet above mean sea level in the western edge to sea level at the eastern mouth of the Bayou. Soils are clays or loams with low permeability.

The narrow, shallow channels of the headwaters to Dickinson Bayou are often blocked by fallen trees and scrub-shrub debris. These natural "snags" from trees and debris slow down the flow of flood waters and have caused over-bank flooding into riparian and coastal flatwood forests along the bayou as well as urban development projects.

Detritus from plants and animal remains provide nutrients to the watershed. Emergent and submergent plants along the waterway provide food and shelter for forage fish and benthic invertebrates, which are food for larger predators, and recreationally fished by the general public. Typical species found in these aquatic habitats include blue crabs (*Calinectes sapidus*), fingernail clams (*Pisidium compressum*), menhaden (*Brevoortia patronus*), striped mullet (*Mugil cephalis*) and spotted sea trout (*Cynoscion nebulosus)* (See **Appendices D, E and F** for comprehensive lists). Juvenile brown and white shrimp (*Farfantepenaeus aztecus* and *Litopenaeus setiferus)* are also found in the lower estuarine portions of the Bayou, which is designated as a "protected nursery area" by Texas Parks and Wildlife Department (TPWD) and is closed to commercial and recreational fishing.

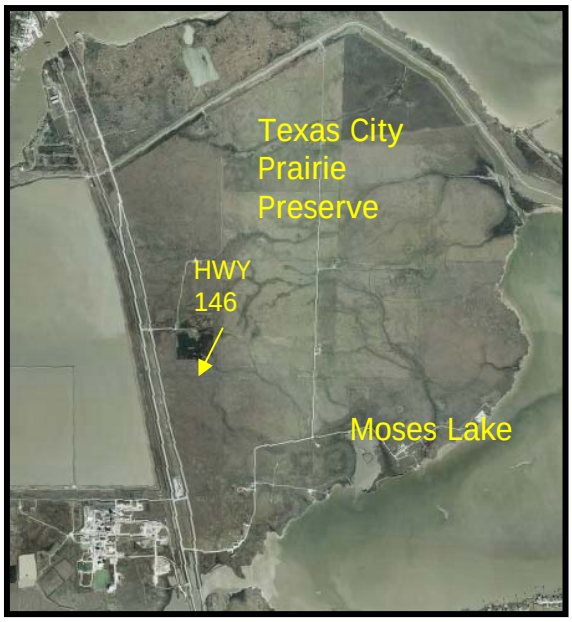
Protected Lands

For the purpose of this document, we are defining protected lands as areas that are set aside as parkland, nature preserves or lands utilized for boat ramps. These areas are included within the Dickinson Bayou Habitat Restoration Plan because of the potential each site represents as opportunities for restoration or additional preservation/conservation.



The Marston Preserve, Dickinson, Texas, outlined

There are many county, private and local parks within the watershed. The parks are primarily day-use facilities with planned recreational use areas for picnics, walking trails, fishing and boating access, baseball and softball fields with batting cages, as well as open space areas for other activities. Within the watershed, there are 2 preserves: the Marston Preserve and the Texas City Prairie Preserve.



Texas City Prairie Preserve, Texas City, Texas; Dickinson Bayou watershed

The Marston Preserve is one of the few remaining heavily forested, urban riparian land tracts of property along Dickinson Bayou, thanks to excellent care by current and previous private owners. This property formerly owned by Edgar Marston, was accepted into the Legacy Land Trust and has a permanent conservation easement associated with it. Although the property changed hands in 2002, the conservation easement remains no matter the owners now or in the future. A former large swimming pool on the tract has been converted to a functioning wetland and remains on the property as part of the conservation easement held by the Land Legacy Trust agreement.

The Texas City Prairie Preserve features rare coastal prairie habitat and is one of the last remaining sites that supports wild Attwater's prairie chickens. Restoration of the coastal prairie is a primary stewardship activity on the preserve. Cattle grazing, which has occurred on the prairie since the late 1800s, continues to provide a substitute for the wandering herds of bison that are no longer present. Through the use of prescribed burning, the Conservancy staff is returning natural fire to the preserve. Chinese tallow trees, a non-native species that poses a serious threat to coastal prairies, are being eliminated.

At the time of this publication, the Land Use Workgroup of the Dickinson Bayou Watershed Committee has submitted a draft of the parks for the watershed. A final version of this list will appear as part of the final watershed plan to be published in Spring 2008.

Invasive Species

There are a number of invasive and destructive exotic species in the Dickinson Bayou Watershed. An invasive species is defined as “a species that is not native to the

ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health." Invasive species displaces a native species by out-competing the native species for resources, and reproducing within the habitat.

There are several exotic animal and plant species in the watershed that have created challenges in habitat restoration efforts, including, but not limited to: Chinese tallow, nutria, grass carp and feral cat populations.

Chinese Tallow, leaves

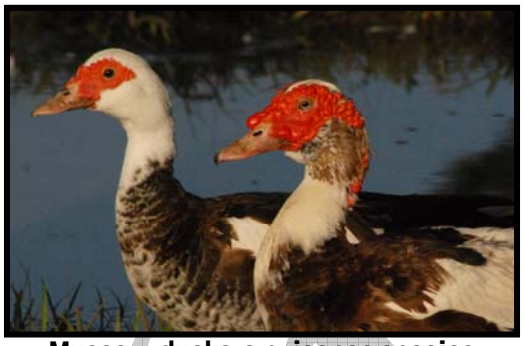
Chinese tallow (*Triadica sebifera*) was introduced to the United States in the 1700 as an ornamental tree. However, since its introduction, the tallow tree has dominated prairies (particularly disturbed prairie land), wet meadows, wetlands and riparian habitats. The tallow tree produces tannins which alter soil chemistry and can limit the growth of native vegetation. A young tallow sapling can produce thousands of seeds which can remain dormant for significant periods of time. Additionally, tallow trees can sprout new shoots from their roots and trunk; all factors leading to its aggressive ability to take over native habitats. While no biological controls have been identified to counter the Chinese tallow, management techniques such as hydro-axing or shredding, mulching, prescribed fire and mowing can provide adequate control for native habitats.

Nutria (*Myocaster coypus*) feed on the roots and stems of marsh vegetation, digging underneath and overturning the plants to feed on the root mat. This feeding behavior does not allow a plant to survive after it is fed upon. Nutria compete directly with native muskrats, beavers, and other similar native species for habitat; often causing the displacement of these native species. Nutria feed primarily on marsh vegetation that extends above the waterline. Nutria use their beaver-sized incisors and powerful forefeet to dig under the marsh surface to feed directly on the root mat, leaving the marsh pitted with holes and deep swim canals. By attacking the

Nutria, an invasive rodent present within the watershed

very structure that holds the marsh together, the vegetative root mat, nutria can undermine the health of adjacent intact marsh, as well.

Escaped or feral populations of formerly domesticated animals are considered invasive species in the watershed. For instance, muscovy ducks and feral cats present an interesting challenge to habitat restoration and the restoration of native species. Muscovy ducks are herbivores and in newly restored areas, can uproot and devastate the entire restoration site. Additionally, muscovy ducks can create large messes with their droppings. Parks within the watershed experience this potential health hazard. Likewise, the mucovy's ability to breed with wild duck populations create another vector for avian diseases. While feral cats do not actively destroy native habitats, large colonies of feral cats have been documented to decimate native bird populations (*USFWS publication*).



Muscovy ducks, a nuisance species within the watershed

Elephant Ear

Some invasive aquatic plant species present within the watershed includes elephant ear, water lettuce and alligator weed. The threat from invasive aquatic plants lies in their ability to out-reproduce and displace the native species. Without existing biological control to check their growth and development, these species can dominate our natural aquatic areas, reducing the necessary habitat and food resources of our native fish, reptile, amphibian, bird and insect species.

Water Lettuce

Another negative impact of invasive aquatic species is the induction of low dissolved oxygen (DO) levels within the water column. Dense mats of invasive plants may cover the water surface and inhibit or stop oxygen exchange with the air. These mats may also consume the existing dissolved oxygen within the water column through decomposition of vegetative matter (e.g. plant leaves). Most aquatic life, from plankton to fish, need oxygen to survive and thus depend on dissolved oxygen within the water column. Low levels of DO with the bayou and its tributaries will negatively impact local fisheries populations.

Aquatic invasive fish species can originate from aquarium pet releases. Many people release these aquarium fish when they get too large or when they no longer want the fish, thinking their actions are humane. The releasing of these fish into local waters, however, create a larger watershed problem.

Channel Apple Snail

A recent invertebrate invasive species to the watershed includes the channel apple snail (*Pomacea canaliculata*). This highly prolific invader has been introduced by the public through pet releases. This snail has been dispersed in the watershed through flood waters from the Brazos River and American Canal that provide municipal water to Texas City as well as the rice farm within the watershed.

See **Appendix G** for comprehensive list of invasive species for the Dickinson Bayou Watershed. Footnotes include species of potential concern but which are not currently present within the watershed.

Current Status of Habitats in Dickinson Bayou

Wetlands, forests, prairies and aquatic habitats provide a multitude of services within the landscape for native creatures (Refer to **Appendices H and I** for birds and mammals). These habitats serve as "homes," foraging areas, breeding grounds, nursery sites, stormwater filters, and flood retention/detention areas.
The loss of such habitats thus impacts the people and animals dependent on the resource.

The status of wetland habitats in the Dickinson Bayou watershed were addressed by Calnan and Jennings (1994).

> "Wetland loss from numerous processes, including subsidence, filling and drainage has occurred in ... the Dickinson Bayou watershed. Approximately 54 percent of the wetland in the Dickinson bayou watershed ...were lost between the 1950's and 1989."

1995 aerial photo of wet prairie meadow within the Dickinson Bayou watershed

2004 aerial photo of the same site within the watershed which is now developed

Because wetland and aquatic habitats are intricately linked to water and water quality, the state of the water is equally important to understand. Calnan and Jennings (1995) reported:

> "In addition, both the tidal and nontidal segments of Dickson Bayou are classified as 'water-quality limited' by the Texas Commission on Environmental Quality (TCEQ) due to elevated levels of total phosphorus, orthophosphorus, and fecal coliform bacteria."

This concern regarding the local water quality has led to the current Total Maximum Daily Load (TMDL) modeling for the bayou. The TMDL process will collect a variety of data (i.e. bathymetric, heavy metals load) and develop a model to predict the functions of the bayou and also identify sources of loads into the system. The TMDL will also identify potential means for reducing those impairing loads to the system. (The TMDL process and associated information is discussed in more depth in the Water Quality section of the Dickinson Habitat Plan (Dickinson Bayou Watershed Plan 2007)).

Both habitat loss and water quality impairment continue to plague the watershed. Development pressure has not diminished for the watershed and, therefore, the associated pressure to convert surrounding habitats remains. Restoration of habitats on protected lands will remain a primary means for conservation within the watershed.

Habitat Restoration Goals and Plan

The Dickinson Bayou Habitat Subcommittee developed a series of goals related to the restoration and continued conservation of habitats within the watershed. The goals reflect the major concerns of the subcommittee and are an attempt to address the habitat issues affecting the watershed:

Consensus Goals for the Habitat Subcommittee:	
1	**Identify areas where invasive plants grow and develop an invasive vegetation management plan**
2	**Identify invasive/exotic animals and develop an invasive/exotic animal management plan**
3	**Identify wetland areas for restoration and develop a restoration plan**
4	**Identify valuable natural habitats and develop a plan to preserve and/or restore these areas**
5	**Complete wetland restoration project at Paul Hopkins Park**
6	**Complete wetland restoration project at Highway 3 Boat Ramp**
7	**Estimate the amount of remaining forested riparian habitat within the watershed**

Currently, two sites within the watershed have been identified for restoration. These sites were initially identified because of their particular need (historically present emergent marsh which have been displaced), feasibility for restoration (accessible to volunteers and restorationists), and public impact (sites are visible to public and are located in and enhance public parks). These sites are the demonstration projects intended to test new plant materials for the system. Several efforts have been made in the past on-site or similar locations only to be "unrestored" by resident herbivores, many of which are nuisance introduced species.

Potential Site 1 - Paul Hopkins Park

Potential Site 2 - Highway 3 Boat Ramp

Restoration of habitats within the watershed are dependent on many factors, including but not limited to: financial resources, land availability, owner cooperation/ participation.

Currently, habitat restoration is limited primarily to public properties such as parks or other protected lands, which represent a small percentage of lands within the watershed. There are many potential wetland restoration sites within the bayou channel itself, where existing shelves can easily be revegetated; however, these sites are privately owned or adjacent to private lands. The questions of accessibility and ownership for these potential sites essential inhibit any opportunity for restoration at this time.

Example of potential restoration site with bare shelf

For example, the Galveston Bay Foundation's Habitat Conservation Blueprint identified multiple sites along the riparian corridor of Dickinson Bayou. However, restoration within the channel becomes complicated due to ownership and access.

Recreated diagram from the Habitat Conservation Blueprint for the Dickinson Bayou marshes potential restoration sites.

The Dickinson Bayou watershed, like most watersheds, is mostly privately owned parcels, essentially placing the majority of the burden of protection onto the shoulders of individual landowners/homeowners. Texas Cooperative Extension and the Galveston Bay Foundation have joined efforts to promote the "Living Shorelines" project. The project advocates alternatives to traditional bulkhead, which include habitat creation to stabilize the shoreline. The joint effort included a series of public workshops and materials describing alternative shoreline protection methods (brochure available online at www.urban-nature.org, publications, brochures).

Like wetland restoration, there are opportunities for prairie restoration within the watershed. Similarly, the available sites are located on existing parks and/or protected lands. Prairie restoration unlike wetland restoration will require management of the restoration site, including mowing and invasive management. This type of management requires that potential sites have associated staff (ie. Park staff) to continue the management.

The Dickinson Bayou watershed has many issues with regards to habitat conservation and the maintenance of existing habitat functionality. These concerns will have to be addressed in conjunction with current land use practices and development pressures, this is the intent behind the Dickinson Bayou Watershed Protection Plan.

The League City park represents a unique native prairie complex which is almost extinct within the watershed.

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Appendix A – Houston-Galveston Area Council Land Use/Land Cover Map

The Land Cover map was based on GIS interpretation of aerial photographs compiled by HGAC in 2002 to estimate agriculture and urban development. These interpretations have not been verified because many areas are located on private lands. Additionally, the data does not accurately reflect heavily wooded residential areas. These areas would not represent "true" wooded habitats. This information will be refined as part of the groundtruthing process which is on-going within the Habitat Subcommittee.

The Houston Galveston Area Council (HGAC) Land Cover (HGAC 2002) map represents a conservative estimation of the seven major habitats within the watershed (Figure 1, below). Corresponding table with acreages:

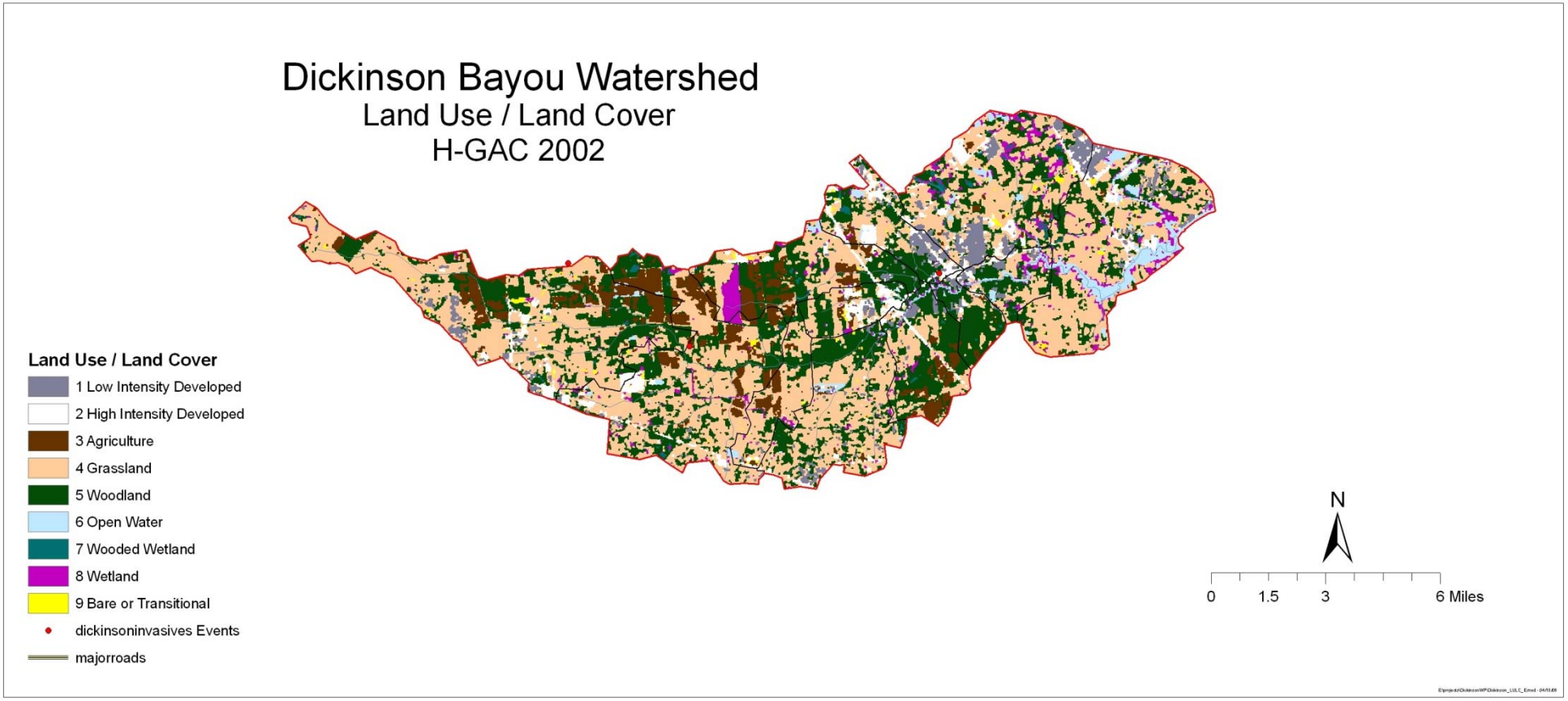
Table 1 : HGAC Land Cover Map Data –

Estimated Acreage based on Land Cover Type

Land Use / Cover Type	Acres
Low Intensity Developed	3175
High Intensity Developed	3627
Agriculture	5253
Grassland	30,455
Woodland	20,009
Open Water	2130
Wooded Wetland	478
Wetland	2165
Bare or Transitional	477

Originally, the Habitat Workgroup of the Dickinson Bayou Watershed Committee intended to use the HGAC Land Use/Land Cover Map to describe the habitats of the watershed. The Habitat Workgroup believes the scale use to develop the Land Use/Cover map and acreages is not an accurate estimation of acreage for remaining habitats. Therefore, the workgroup established a goal to develop more accurate estimation of remaining habitats and estimations of loss over time which are included in the "Goals and Plans" section of this document.

Figure 1 - HGAC Land Cover/Land Use Map with Designated Habitats within the Dickinson Bayou watershed



Appendix B - Endangered and Threatened Plants in Texas and the United States

Cacti | Trees and Shrubs | Wildflowers | Orchids | Grasses

Cacti	State Status	Federal Status (Listed)
Tobusch Fishhook Cactus *Sclerocactus brevihamatus* ssp. *tobuschii*	Endangered	Endangered
Bunched Cory Cactus *Coryphantha ramillosa* ssp. *ramillosa*	Threatened	Threatened
Black Lace Cactus *Echinocereus reichenbachii* var. *albertii*	Endangered	Endangered
Davis' Green Pitaya *Echinocereus viridiflorus* var. *davisii*	Endangered	Endangered
Chisos Mountains Hedgehog Cactus *Echinocereus chisoensis* var. *chisoensis*	Threatened	Threatened
Lloyd's Mariposa Cactus *Sclerocactus mariposensis*	Threatened	Threatened
Nellie's Cory Cactus *Escobaria minima*	Endangered	Endangered
Sneed's Pincushion Cactus *Escobaria sneedii* var. *sneedii*	Endangered	Endangered
Star Cactus *Astrophytum asterias*	Endangered	Endangered
Trees, Shrubs, and Sub-shrubs	**State Status**	**Federal Status (Listed)**
Hinckley's Oak *Quercus hinckleyi*	Threatened	Threatened
Johnston's Frankenia *Frankenia johnstonii*	Endangered	Endangered - Proposed to be Delisted
Texas Ayenia *Ayenia limitaris*	Endangered	Endangered
Texas Snowbells *Styrax platanifolius* spp. *texanus*	Endangered	Endangered
Walker's Manioc *Manihot walkerae*	Endangered	Endangered

Wildflowers	State Status	Federal Status (Listed)
South Texas Ambrosia *Ambrosia cheiranthifolia*	Endangered	Endangered
Pecos Sunflower *Helianthus paradoxus*	Threatened	Threatened
Texas Prairie Dawn *Hymenoxys texana*	Endangered	Endangered
Ashy Dogweed *Thymophylla tephroleuca*	Endangered	Endangered
Terlingua Creek Cat's-eye *Cryptantha crassipes*	Endangered	Endangered
Zapata Bladderpod *Lesquerella thamnophila*	Endangered	Endangered
White Bladderpod *Lesquerella pallida*	Endangered	Endangered
Tinytim (Earth-fruit) *Geocarpon minimum*	Threatened	Threatened
Slender Rush-pea *Hoffmannseggia tenella*	Endangered	Endangered
Texas Poppy-mallow *Callirhoe scabriuscula*	Endangered	Endangered
Large-fruited Sand-verbena *Abronia macrocarpa*	Endangered	Endangered
Texas Trailing Phlox *Phlox nivalis* ssp. *texensis*	Endangered	Endangered
Chaffseed *Schwalbea americana*		Endangered
Orchids	**State Status**	**Federal Status (Listed)**
Navasota Ladies'-tresses *Spiranthes parksii*	Endangered	Endangered

Grasses and Grass-like Plants	State Status	Federal Status (Listed)
Texas Wild-rice *Zizania texana*	Endangered	Endangered
Little Aguja Pondweed *Potamogeton clystocarpus*	Endangered	

Appendix C - Common Trees found within the Watershed

Common Name	Scientific Name	Comments
Ash, Green	*Fraxinus pennsylvanica*	ABNC observation
Basswood	*Tilia caroliniana*	ABNC observation
Beauty-Berry, American	*Callicarpa americana*	ABNC observation
Birch, River	*Betula nigra*	ABNC observation
Buckthorn, Carolina	*Rhamnus caroliniana*	ABNC observation
Cedar, (Eastern) Red	*Juniperus virginiana*	ABNC observation
Centaury, Branched	*Centaurium pulchellum*	Brown (2001)
Cypress, Bald	*Taxodium distichum*	ABNC observation
Elm, American	*Ulmus americana*	ABNC observation
Elm, Cedar	*Ulmus crassifolia*	ABNC observation
Elm, Winged	*Ulmus alata*	ABNC observation
Greenbriar, Saw	*Smilax bona-nox*	ABNC observation
Hackberry, Sugar	*Celtis levigata*	ABNC observation
Hawthorn, Parsley	*Crataegus marshallii*	ABNC observation
Hercules Club / Tickle Tongue	*Zanthoxylum clava-herculis*	ABNC observation
Hickory, Bitternut	*Carya cordiformis*	Brown (2001)
Hickory, Pignut	*Carya glabra*	ABNC observation
High Tide Bush / Iva	*Iva frutescens*	ABNC observation
Holly, Deciduous / Possum-Haw	*Ilex decidua*	ABNC observation
Huisache	*Acacia farnesiana*	
Ligustrum, Wax-Leaf	*Ligustrum licidum*	Brown (2001); Non-native, invasive
Locust, Honey	*Gleditsia triacanthos*	
Mulberry, Red	*Morus rubra*	ABNC observation
Mulberry, White	*Morus alba*	Brown (2001); Non-native
Oak, Cherrybark	*Quercus falcata*	ABNC observation
Oak, Live	*Quercus virginiana*	ABNC observation
Oak, Post	*Quercus stellata*	ABNC observation
Oak, Water	*Quercus nigra*	ABNC observation
Oak, Willow	*Quercus phellos*	ABNC observation
Onion, Wild	*Allium canadense*	Brown (2001)
Orange, Trifoliate	*Citrus trifoliata*	ABNC observation
Osage Orange	*Maclura pomifera*	ABNC observation
Palmetto, Dwarf	*Sabal minor*	ABNC observation
Pear, Callery	*Pyrus calleryana*	Brown (2001)
Pecan	*Carya illinoensis*	ABNC observation
Pine, Loblolly	*Pinus taeda*	ABNC observation
Pine, Slash	*Pinus elliottii*	ABNC observation

Privet, Chinese	*Ligustrum sinense*	Non-native; invasive
Privet, Japanese	*Ligustrum japonica*	Non-native; invasive
Privet, Upland	*Forestiera ligustrina*	ABNC observation
Privet, Upland	*Mimosa strigillosa*	Brown (2001)
Rattlebox, Drummond	*Sesbania drummondii*	ABNC observation
Rattlesnake Master	*Eryngium yuccifolium*	Brown (2001)
Rose-Mallow, Halberd-Leaved	*Hibiscus militaris*	ABNC observation
Wood Sage	*Teucrium canadense*	Brown (2001)
Shrubby Seedbox	*Ludwigia octovalvis*	Brown (2001)
Sweetgum	*Liquidambar styraciflua*	ABNC observation
Sycamore, American	*Platanus occidentalis*	ABNC observation
Chinese Tallow	*Triadica sebifera*	ABNC observation; non-native; invasive
Wax Myrtle	*Myrica cerifera*	ABNC observation
Willow, Black	*Salix nigra*	ABNC observation
Willow, Lance-Leaved Water	*Justicia ovata*	Brown (2001)
Yaupon	*Ilex vomitoria*	ABNC observation

Appendix D – Common Fish Found in Dickinson Bayou/Dickinson Bay Texas

Common Name	Scientific Name	Comments
Lined Sole	*Achirus lineatus*	
Bowfin	*Amia calva*	
Sea Catfish	*Arius felis*	
Gafftopsail Catfish	*Bagre marinus*	
Inland Silversides	*Menidia beryllina*	
Tidewater Silversides	*Menidia peninsulae*	
Bay Whiff	*Citharichthys spilopterus*	
Southern Flounder	*Paralichthys lethostigma*	
Blue Runner	*Caranx crysos*	
Leatherjack	*Oligoplites saurus*	
River Carpsucker	*Carpiodes carpio*	
Creek Chubsucker	*Erimyzon oblongus*	
Smallmouth Buffalo	*Ictiobus bubalus*	
Blacktail Redhorse	*Moxostoma poecilurum*	
Green Sunfish	*Lepomis cyanellus*	
Warmouth	*Lepomis gulosus*	
Orangespotted Sunfish	*Lepomis humilis*	
Bluegill / Bluegill Sunfish	*Lepomis macrochirus*	
Dollar Sunfish	*Lepomis marginatus*	
Longear Sunfish	*Lepomis megalotis*	
Redear Sunfish	*Lepomis microlophus*	
Largemouth Bass	*Micropterus salmoides*	
Yellow Bass	*Morone mississippiensis*	
White Crappie	*Pomoxis annularis*	
Black Crappie	*Pomoxis nigromaculatus*	
Gulf Menhaden	*Brevoortia patronus*	

Gizzard Shad	*Dorosoma cepedianum*	
Threadfin Shad	*Dorosoma petenense*	
Blackcheek Tonguefish	*Symphurus plagiusa*	
Grass Carp	*Ctenopharyngodon idella*	
Common Carp	*Cyprinus carpio*	
Golden Shiner	*Notemigonus crysoleucas*	
Sheepshead Minnow	*Cyprinodon variegatus*	
Gulf Killifish	*Fundulus grandis*	
Bayou Killifish	*Fundulus pulverous*	
Rainwater Killifish	*Lucania parva*	
Ladyfish	*Elops saurus*	
Bay Anchovy	*Anchoa mitchilli*	
Diamond Killifish	*Adinia xenica*	
Violet Goby	*Gobioides broussonetti*	
Naked Goby	*Gobiosoma bosc*	
Clown Goby	*Microgobius gulosus*	
Blue Catfish	*Ictalurus furcatus*	
Black Bullhead	*Ictalurus melas*	
Yellow Bullhead	*Ictalurus natalia*	
Channel Catfish	*Ictalurus punctatus*	
Flathead Catfish	*Pylodictis olivaris*	
Spotted Gar	*Lepisosteus oculatus*	
Longnose Gar	*Lepisosteus osseus*	
Shortnosed Gar	*Lepisosteus platostomus*	
Alligator Gar	*Lepisosteus spatula*	
Striped Mullet	*Mugil cephalus*	
White Mullet	*Mugil curema*	
Mosquitofish	*Gambusia affinis*	
Sailfin Molly	*Poecilia latipinna*	

Freshwater Drum	*Aplodinotus grunniens*	
Sand Seatrout	*Cynoscion arenarius*	
Spotted Seatrout (Speckled Seatrout)	*Cynoscion nebulosus*	
Spot	*Leiostomus xanthurus*	
Atlantic Croaker	*Micropogonias undulatus*	
Black Drum,	*Pogonias cromis*	
Red Drum	*Sciaenops ocellatus*	
Hogchoker	*Trinectes maculatus*	
Sheepshead	*Archosargus probactocephalus*	
Pinfish	*Lagodon rhomboides*	
Gulf Pipefish	*Syngnathus scovelli*	
Southern Puffer	*Sphoeroides nephelus*	
Bighead Searobin	*Prionotus tribulus*	

Appendix E - Endangered and Threatened Invertebrates in Texas and the United States

Crustaceans | Insects | Mollusks

Crustaceans	State Status	Federal Status (Listed)
Peck's Cave Amphipod (PDF 468.3 KB) Edwards Aquifer Species Management (PDF 81.8 KB) *Stygobromus pecki*	Endangered	Endangered
Insects	**State Status**	**Federal Status (Listed)**
American Burying Beetle *Nicrophorus americanus*		Endangered
Comal Springs Riffle Beetle (PDF 468.3 KB) Edwards Aquifer Species Management (PDF 81.8 KB) *Heterelmis comalensis*		Endangered
Tooth Cave Ground Beetle *Rhadine persephone*		Endangered
A Ground Beetle *Rhadine exilis*		Endangered
A Ground Beetle *Rhadine infernalis*		Endangered
Kretschmarr Cave Mold Beetle *Texamaurops reddelli*		Endangered
Coffin Cave Mold Beetle *Batrisodes texanus*		Endangered
Helotes Mold Beetle *Batrisodes venyivi*		Endangered
Comal Springs Dryopid Beetle (PDF 468.3 KB) Edwards Aquifer Species Management (PDF 81.8 KB) *Stygoparnus comalensis*		Endangered
Spiders and Relatives	**State Status**	**Federal Status (Listed)**
Tooth Cave Spider *Neoleptoneta myopica*		Endangered
Government Canyon Bat Cave Spider *Neoleptoneta microps*		Endangered
Reddell Harvestman *Texella reddelli*		Endangered
Bone Cave Harvestman *Texella reyesi*		Endangered

Crustaceans	State Status	Federal Status (Listed)
Cokendolpher Cave Harvestman *Texella cokendolpheri*		Endangered
Tooth Cave Pseudoscorpion *Tartarocreagris texana*		Endangered
Madla Cave Meshweaver *Cicurina madla*		Endangered
Robber Baron Cave Meshweaver *Cicurina baronia*		Endangered
Bracken Bat Cave Meshweaver *Cicurina venii*		Endangered
Government Canyon Bat Cave Meshweaver *Cicurina vespera*		Endangered
Mollusks	**State Status**	**Federal Status (Listed)**
Ouachita Rock-pocketbook Mussel *Arkansia wheeleri*	Endangered	Endangered
Pecos Assiminea Snail *Assiminea pecos*		Endangered

Appendix F – Common Reptiles and Amphibians of Dickinson Bayou/Dickinson Bay, Texas

Reptiles - Snakes	Scientific Name	Comments
Eastern Yellow-bellied Racer	*Coluber constrictor*	
Great Plains Rat Snake	*Elaphe guttata emoryi*	
Texas Rat Snake	*Elaphe obsoleta*	
Western Mud Snake	*Farancia abacura reinwardtii*	
Eastern Hognose Snake	*Heterdon platyrhinos*	
Prairie Kingsnake	*Lampropeltis calligaster*	
Speckled Kingsnake	*Lampropeltis getulus*	
Eastern Coachwhip	*Masticophis flagellum*	
Yellowbelly Water Snake	*Nerodia erythrogaster favigaster*	
Gulf Saltmarsh Snake	*Nerodia clarkii*	Threatened
Blotched Water Snake	*Nerodia erythrogaster transversa*	
Broad-banded Water Snake	*Nerodia fasciata confluens*	
Diamondback Water Snake	*Nerodia rhombifer rhombifer*	
Rough Green Snake	*Ophyodrys aestivus*	
Graham's Crayfish Snake	*Regina grahamii*	
Marsh Brown Snake	*Storeria dekayi limnetes*	
Texas Brown Snake	*Storeria dekayi texana*	
Flathead Snake	*Tantilla gracilis*	
Western Ribbon Snake	*Thamnophis proximus proximus*	
Rough Earth Snake	*Virginia striatula*	
Texas Coral Snake	*Micrurus fulvius*	
Southern Copperhead	*Agkistrodon contortix*	
Western Cottonmouth	*Agkistrodon piscivorus*	
Western Pygmy Rattlesnake	*Sistrurus miliarus*	
Reptiles - Alligator	**Scientific Name**	**Comments**

American Alligator	*Alligator mississippiensis*	
Reptiles - Turtles	**Scientifc Name**	**Comments**
Red-eared Slider	*Chysemys scripta elegans*	
Western Chicken Turtle	*Deirochelys reticularia miaria*	
Texas Cooter	*Pseudemys texana*	
Three-toed Box Turtle	*Terrapene carolina triunguis*	
Ornate Box Turtle	*Terrapene ornata ornata*	
Mississippi Mud Turtle	*Kinosternon subrubrum hippocrepis*	
Common Musk Turtle	*Sternotherus odoratus*	
Common Snapping Turtle	*Cholera serpentina serpentina*	
Alligator Snapping Turtle	*Macroclemys temminckii*	State Threatened
Pallid Spiny Softshell	*Trionyx spiniferus pallidus*	
Texas Diamondback Terrapin	*Malaclemys terrapin littorlis*	State Threatened
Reptiles – Lizards, Anoles and Skinks	**Scientific Name**	**Comments**
Green Anole	*Anolis carolinensis*	
Western Slender Glass Lizard	*Ophisaurus attenuatus attenuatus*	
Texas Horned Lizard	*Phrynosoma cornutum*	State Threatened
Five-lined Skink	*Eumeces fasciatus*	
Broadhead Skink	*Eumeces laticeps*	
Ground Skink	*Scincella lateras*	
Mediterranean Gekko	*Hemidactylus turcicus*	
Amphibians – Frogs and Toads	**Scientific Name**	**Comments**
Cricket Frog	*Acris crepitans*	
Blanchard's Cricket Frog	*Acris crepitans creptians*	
Cope's Gray Treefrog	*Hyla chrysoscelis*	
Green Treefrog	*Hyla cinerea*	

Squirrel Treefrog	*Hyla squirella*	
Gray Treefrog	*Hyla versicolor*	
Northern Spring Peeper	*Pseudacris crucifer crucifer*	
Upland Chorus Frog	*Pseudacris triseriata feriarum*	
Sheep Frog	*Hypopachus variolosus*	
Bullfrog	*Rana catesbeiana*	
Leopard Frog	*Rana sphenocephala*	
Eastern Narrow-mouth Toad	*Gastrophryne carolinensis*	
Gulf Coast Toad	*Bufo valliceps vaiilcpes*	
Amphibians – Salamanders and Aquatic Salamanders	**Scientific Name**	**Comments**
Smallmouth Salamander	*Ambystoma texanum*	
Three-toed Amphiuma	*Amphiuma tridactylum*	
Western Lesser Siren	*Siren intermedia nettingi*	
Gulf Coast Waterdog	*Necturus beyeri*	

Appendix G - Invasive Species Identified within the Dickinson Bayou Watershed

Plants	Scientific Name	Comments
Japanese Honeysuckle	*Lonicera japonica*	
Pampas Grass	*Cortaderia jubata*	
Nandina (Also known as "Sacred Bamboo")	*Nandina domestica*	
Bamboo	*Phyllostachys spp.*	
Chinese Tallow	*Sapium sebiferum*	
Chinaberry	*Melia azedarach*	
Firethorn	*Pyracantha*	
Wax-leaf Ligustrum	*Ligustrum japonicum*	
Water Hyacinth	*Eichhornia crassipes*	
Water Lettuce	*Pistia spp.*	
Water Spinach	*Ipomoea aquatica*	Growing in Rosaharron and potential for Chocolate Bayou but not found it in the Dickinson watershed yet
Salvinia	*Salvinia molesta*	
Red-tipped Photinia	*Photinia x fraseri*	
Japanese Boxwood	*Buxus microphylla*	
Japanese Privet	*Ligustrum sinense*	
Salt cedar	*Tamarix spp.*	
Giant Reed	*Arundo donax*	
Asian Jasmine	*Trachelosperum asiaticum*	
Eleagnus	*Eleagnus angustifolia*	
Spindle Tree	*Eunonymus*	
Common water hyacinth	*Eichhornia crassipes*	
Hydrilla	*Hydrilla verticillata*	
Elephant ear	*Colocasia esculenta*	
Chinese tallow	*Triadica sebifera*	

Deep-rooted sedge	*Cyperus entrerianus*	
Invertebrates	**Scientific Name**	**Comments**
Channel Apple Snail	*Pomacea canaliculata*	
Red imported fire ant	*Solenopsis invicta*	The fire ant is a common invasive invertebrate species to the watershed and its introduction to the United States, as documented by the USDA, is the 1930's. Its range has expanded to the southeastern U.S., and its potential for disrupting habitats remains it their predation on ground nesting birds.
Mammals	**Scientific Name**	**Comments**
Nutria	*Myocaster coypus*	Nutria, which are native to South America, were brought to Louisiana in the 1930's as part of the fur trade, escaped into the wild and have since greatly increased in population throughout aquatic habitats in the Southeastern United States as well as the East Coast and part of the Northwestern states.
Capybara	*Hydrochoerus Hydrochaeris*	(Released from Bayou Wildlife Park in 2005)
Feral hog	*Sus scrofa*	
Fish	**Scientific Name**	**Comments**
Common Pleco	*Hypostomus plecostomus*	Although there are no documented cases to date, there have been many reports of Plecostomus and Tiliapia in adjacent watersheds (Clear Creek, Buffalo Bayou, Brays Bayou, Simms Bayou, Halls Bayou, and Greens Bayou). Plecostomus, in particular, can increase the erosion rate of shorelines from their burrowing habits when creating nests or pockets along the banks. This directly impacts marsh or shoreline enhancement efforts.
Tiliapia	*Tilapia*	

Literature Cited

1. Invasive Species Definition Clarification and Guidance White Paper
Submitted by the Definitions Subcommittee of the
Invasive Species Advisory Committee (ISAC)

Approved by ISAC April 27, 2006

Additional information available at:
http://www.galvbaydata.org/projects/invasive/Invasive.html

Appendix H - Endangered and Threatened Birds in Texas and the United States

Waterbirds | Raptors | Upland Birds | Shorebirds | Woodpeckers | Songbirds

Waterbirds	State Status	Federal Status (Listed)
"Eastern" Brown Pelican Brown Pelican (PDF 235.8 KB) **Pelecanus occidentalis**	Endangered	Endangered
Reddish Egret **Egretta rufescens**	Threatened	
White-faced Ibis White-faced Ibis **Plegadis chihi**	Threatened	
Wood Stork **Mycteria americana**	Threatened	
Whooping Crane Whooping Crane (PDF 291 KB) **Grus americana**	Endangered	Endangered
Raptors	**State Status**	**Federal Status (Listed)**
Swallow-tailed Kite Swallow-tailed Kite (PDF 4 MB) **Elanoides forficatus**	Threatened	
Bald Eagle Bald Eagle (PDF 350 KB) Bald Eagle Management (PDF 33.1 KB) **Haliaeetus leucocephalus**	Threatened	Threatened--Proposed for Delisting
Common Black-hawk **Buteogallus anthracinus**	Threatened	
Gray Hawk **Asturina nitidus**	Threatened	
White-tailed Hawk **Buteo albicaudatus**	Threatened	
Zone-tailed Hawk **Buteo albonotatus**	Threatened	
Northern Aplomado Falcon Northern Aplomado Falcon (PDF 1.1 MB) **Falco femoralis septentrionalis**	Endangered	Endangered

Waterbirds	State Status	Federal Status (Listed)
Peregrine Falcon Peregrine Falcon (PDF 286.8 KB) **Falco peregrinus**	Endangered, Threatened	
American Peregrine Falcon **Falco peregrinus anatum**	Endangered	
Arctic Peregrine Falcon **Falco peregrinus tundrius**	Threatened	
Cactus Ferruginous Pygmy-owl **Glaucidium brasilianum cactorum**	Threatened	
Mexican Spotted Owl **Strix occidentalis lucida**	Threatened	Threatened
Upland Birds	**State Status**	**Federal Status (Listed)**
Attwater's Greater Prairie Chicken Attwater's Greater Prairie Chicken (PDF 313.1 KB) Attwater's Greater Prairie Chicken Management (PDF 116 KB) **Tympanuchus cupido attwateri**	Endangered	Endangered
Shorebirds	**State Status**	**Federal Status (Listed)**
Eskimo Curlew **Numenius borealis**	Endangered	Endangered
Interior Least Tern (PDF 307.1 KB) **Sterna antillarum athalassos**	Endangered	Endangered
Piping Plover Piping Plover (PDF 214.1 KB) **Charadrius melodus**	Threatened	Threatened
Sooty Tern **Sterna fuscata**	Threatened	
Woodpeckers	**State Status**	**Federal Status (Listed)**
Red-cockaded Woodpecker Red-cockaded Woodpecker (PDF 563.5 KB) Red-cockaded Woodpecker Management (PDF 114.1 KB) *Picoides borealis*	Endangered	Endangered
Ivory-billed Woodpecker **Campephilus principalis**	Endangered	Endangered

Songbirds	State Status	Federal Status (Listed)
Northern Beardless-tyrannulet **Camptostoma imberbe**	Threatened	
Southwestern Willow Flycatcher **Empidonax traillii extimus**	Endangered	Endangered
Rose-throated Becard **Pachyramphus aglaiae**	Threatened	
Black-capped Vireo **Black-capped Vireo** (**PDF** 331.7 KB) **Black-capped Vireo Management** (**PDF** 224.7 KB) **Vireo atricapillus**	Endangered	Endangered
Tropical Parula **Parula pitiayumi**	Threatened	
Golden-cheeked Warbler **Golden-cheeked Warbler** (**PDF** 565.4 KB) **Golden-cheeked Warbler Management** (**PDF** 192.6 KB) **Dendroica chrysoparia**	Endangered	Endangered
Bachman's Sparrow **Aimophila aestivalis**	Threatened	
"Texas" Botteri's Sparrow **Aimophila botterii texana**	Threatened	
"Arizona" Botteri's Sparrow **Aimophila botterii arizonae**	Threatened	

Appendix I - Endangered and Threatened Mammals in Texas and the United States

Bats | Rodents | Marine Mammals | Carnivores

Bats	State Status	Federal Status (Listed)
Mexican Long-nosed Bat Mexican Long-nosed Bat Mexican Long-nosed Bat (PDF 987.5 KB) *Leptonycteris nivalis*	Endangered	Endangered
Southern Yellow Bat *Lasiurus ega*	Threatened	
Spotted Bat *Euderma maculatum*	Threatened	
Rafinesque's Big-eared Bat *Corynorhinus rafinesquii*	Threatened	
Rodents	**State Status**	**Federal Status (Listed)**
Texas Kangaroo Rat *Dipodomys elator*	Threatened	
Coues' Rice Rat *Oryzomys couesi*	Threatened	
Palo Duro Mouse *Peromyscus truei comanche*	Threatened	
Marine Mammals	**State Status**	**Federal Status (Listed)**
Gervais' Beaked Whale *Mesoplodon europaeus*	Threatened	
Goose-beaked Whale *Ziphius cavirostris*	Threatened	
Pygmy Sperm Whale *Kogia breviceps*	Threatened	
Dwarf Sperm Whale *Kogia simus*	Threatened	
Sperm Whale *Physeter macrocephalus*	Endangered	Endangered
Atlantic Spotted Dolphin *Stenella frontalis*	Threatened	
Rough-toothed Dolphin *Steno bredanensis*	Threatened	
Killer Whale	Threatened	

Bats	State Status	Federal Status (Listed)
Orcinus orca		
False Killer Whale *Pseudorca crassidens*	Threatened	
Short-finned Pilot Whale *Globicephala macrorhynchus*	Threatened	
Pygmy Killer Whale *Feresa attenuata*	Threatened	
Finback Whale *Balaenoptera physalus*	Endangered	Endangered
Blue Whale *Balaenoptera musculus*	Endangered	Endangered
Black Right Whale (Northern Right Whale) *Eubalaena glacialis*	Endangered	Endangered
West Indian Manatee *Trichechus manatus*	Endangered	Endangered
Carnivores	**State Status**	**Federal Status (Listed)**
Red Wolf *Canis rufus*	Endangered	Endangered
Gray Wolf *Canis lupus*	Endangered	Endangered
Black Bear *Ursus americanus*	Threatened	Threatened by Similarity of Appearance (eastern); Not Listed (western)
Louisiana Black Bear **Louisiana Black Bear** (**PDF** 95 KB) *Ursus americanus luteolus*	Threatened	Threatened
Grizzly Bear *Ursus arctos*		Threatened
White-nosed Coati *Nasua narica*	Threatened	
Black-footed Ferret **Black-footed Ferret** (**PDF** 177.2 KB) **Black-footed Ferret Management** (**PDF** 75.1 KB) *Mustela nigripes*	Endangered	Endangered

Ocelot **Ocelot** (**PDF** 195.3 KB) **Ocelot and Jaguarundi Management** (**PDF** 86.3 KB) *Leopardus pardalis*	Endangered	Endangered
Margay *Leopardus wiedii*	Threatened	
Jaguarundi **Jaguarundi** (**PDF** 158.9 KB) **Jaguarundi and Ocelot Management** (**PDF** 86.3 KB) *Herpailurus yaguarondi*	Endangered	Endangered
Jaguar *Panthera onca*	Endangered	Endangered