Tule Marsh East Master Plan

September 10, 2009

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History of Tule Marsh East

Tule East Marsh was originally part of extensive wetlands to the east and downstream from Tule Lake, with Tule Creek draining into it (Photo 1). The wetlands acted as a floodwater retention area for Tule Creek drainage from the north and west, along with Long Reach Canal and Canoe Lake farther to the east. The original Tule Lake extended from the north end of this site, went under State Highway 35, and backed north to past Henderson Street.(Photo 1) It covered about 12 acres and was up to 6 ft deep in the year 1939 (Photo 5).

The Tule West Ditch was later built to carry treated sewer plant effluent and storm water from the areas of County Road 2165 and adjacent development areas to the old Tule Lake site. (Photo 2) When the lake overflowed, water moved into the Tule East Marsh and to a ditch above sea level and into Little Bay.

Photo 1. Tule Wetlands, 1959-Lake to East and West of Tx 35 with the Marsh below East end of lake, Little Bay to right

Photo 2-Tule Creek Watershed to Little Bay-Tule Lake and Marsh in center right, Tule Ditch West extending to southwest to sewer treatment plant

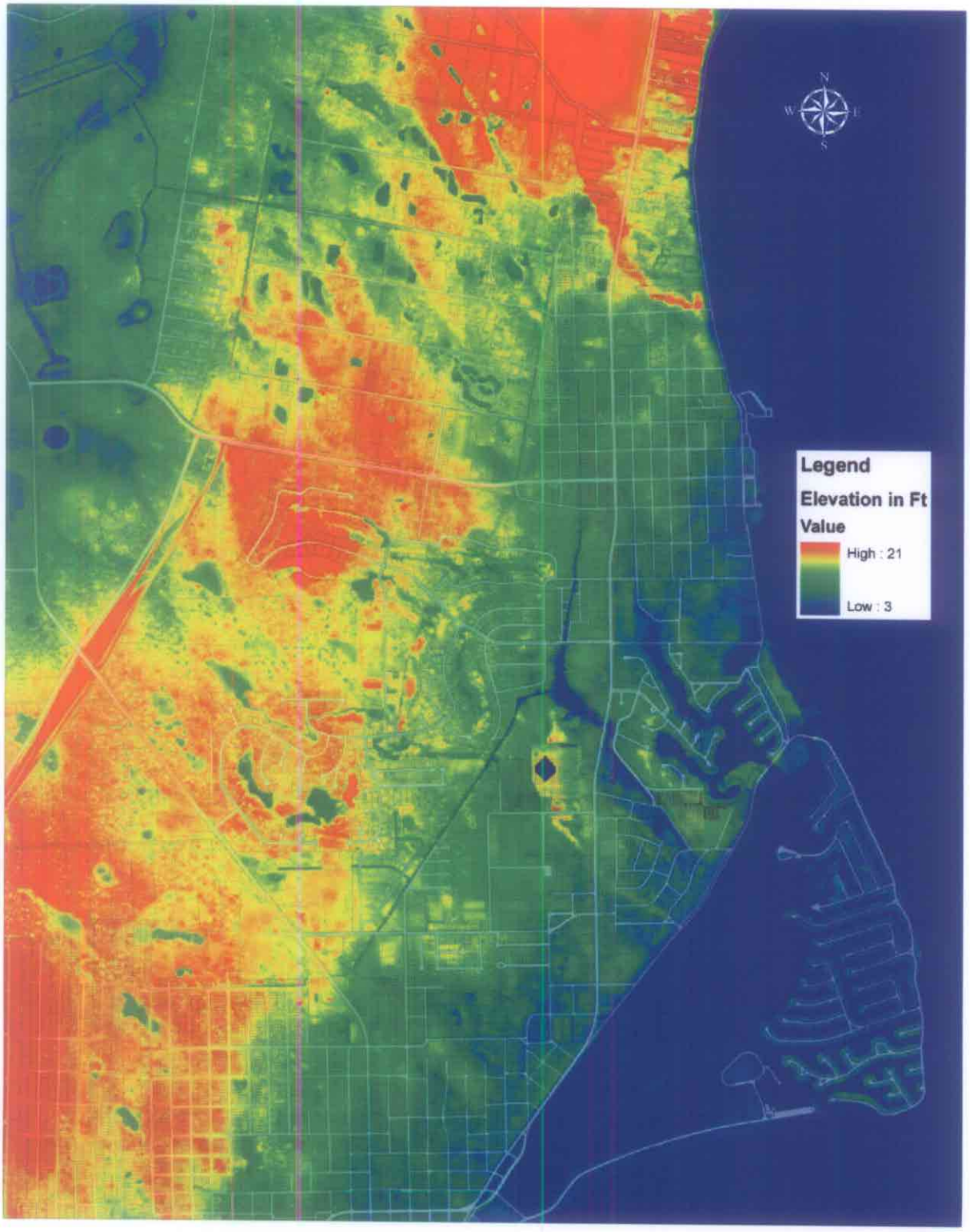

Photo 3-Tule East Marsh-2006

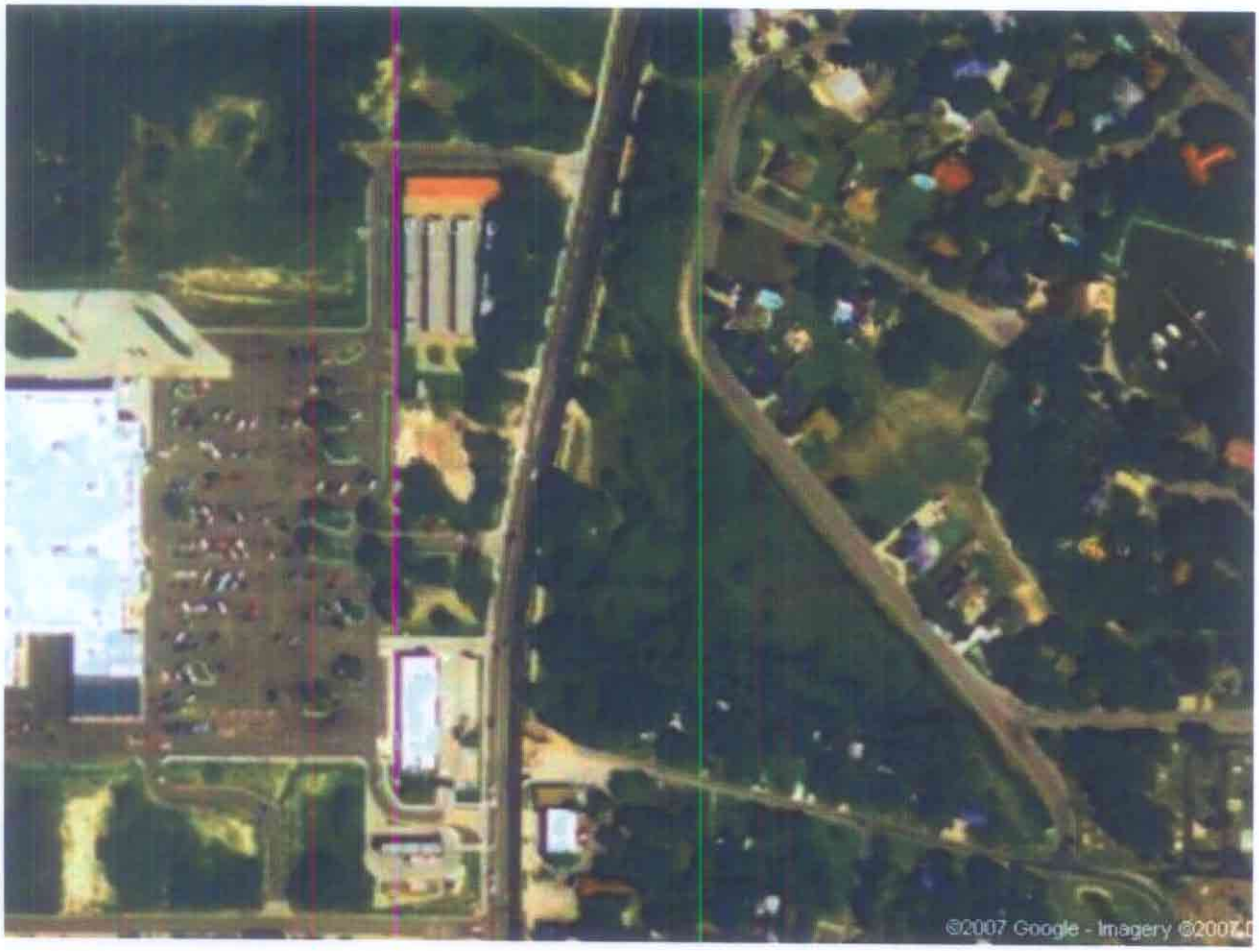

Photo 4-Overgrown old Tule Lake West Lakebed with North portion of Tule East Marsh below-2009

Photo 5: Tule Lake from TX 35 bridge, 1939(picture courtesy TxDot)

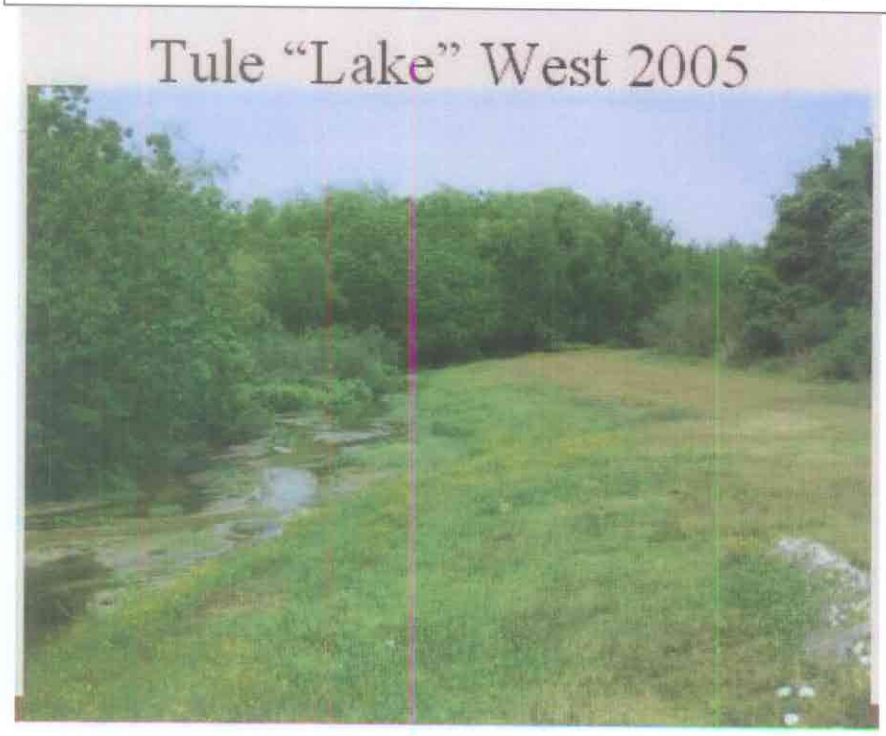

Photo 6. Tule Lake West of bridge over Hiway 35- Silted In-20

The portion east of Highway 35 was filled in during development of Harbor Oaks Subdivision and the excavation of Canoe Lake. The old lake and most of the wetlands west of Highway 35 have drained and are now fully silted in and (Photos 4,5,6) have to be dredged periodically to keep the creek bed open.

The marsh dried to only groundwater level and seepage ponds with no temporary retention capacity. (Photo 3) Vegetation replaced the former water covered areas. In the late 1970's and early 1980's the large trumpet vine growth was a great habitat for birding. The Friends of Connie Hagar built a native plant garden on the adjacent Texas Department of Transportation Roadside Park in the early 1980's, and later a Boardwalk onto the 5-acre City of Rockport tract in the late 1990's (Photo 7).

Photo 7: Boardwalk -2007

Restoration and Development Phase 1

Thick monotypic stands of non-native invasive plants such as wild bamboo, Brazilian pepper, duck potato, and Chinese tallow began to overwhelm the native trees such as live oak, sweet bay, and black willow, shrubs such as yaupon, coral bean, bayberry, and American beautyberry (Photos 8 and 9).

Photo 8. Overgrowth of invasive plants to north of boardwalk.

Photo 9. Overgrowth of invasive plants to south of boardwalk covering Live Oaks on the marsh rim.

In 2000 an energetic group of local citizens who had formed the Aransas First Land Trust, leased the property from the City of Rockport in order to restore the area and create a Nature Education Center.

Coastal Management Program Grant

With a Coastal Management Program (CMP) grant from the Texas General Land Office (Photo 10), and with financial assistance from Aransas County, Aransas First constructed a 20 x 30-foot covered pavilion (Photos 11 and 12); built a 700-foot granite-based walking trail with viewing stations on the Live Oak Ridge (Photos 13 and 14); and rebuilt the ridgeline seep ponds (Photos 16-19).

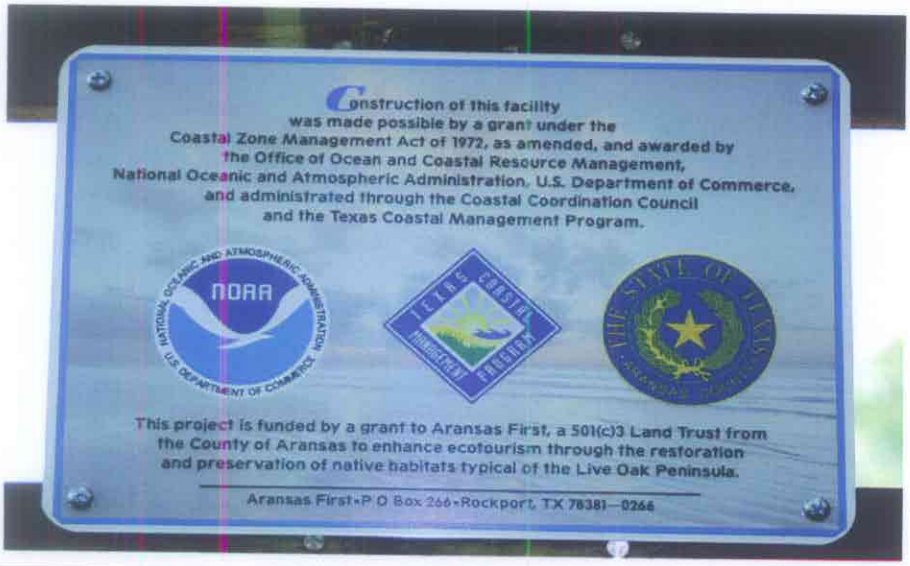

Photo 10. Sign acknowledging the 2008 CMP Grant.

The grant also involved the clearing and removal of large impenetrable thickets of the invasive plants. Heavy equipment was used to clear these thickets and upland areas were scraped down during the process. Beginning to clear the marsh area of non-native invasive vegetation created public access for nature and bird observation. Educational signage has been installed throughout the site (Photos 10-13).

Photo 11. Covered pavilion built in 2009.

Photo 12. Covered pavilion built in 2009.

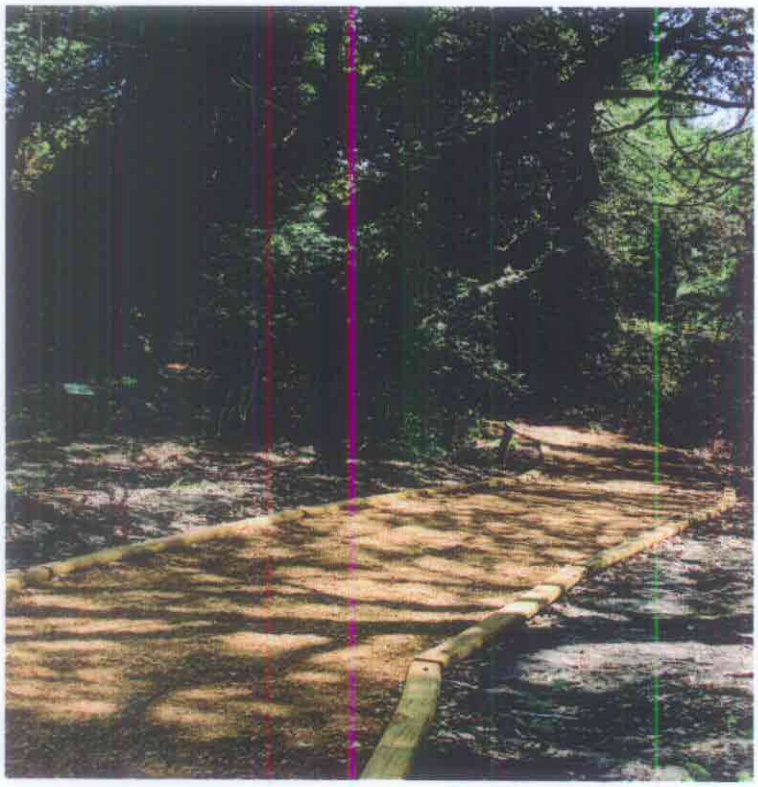

Photo 13. ADA-approved trails with crushed granite base and viewing bulbouts were constructed in 2009.

Photo 14. One of the two viewing "bulbouts" constructed along the trail overlooking W. Seep Pond on Live Oak Ridge.

Photo 15. Original Welcome sign (1980s).

Photo 16. Recent Welcome sign (2008).

Photo 17. Replaceable informative sign for seasonal change.

Photo 10. More permanent signs are affixed all along boardwalk and pavilion railings.

Educational and informational signage has been installed throughout the site.

Photo 19. Tule Marsh East, 2009, after clearing, prior to construction of pavilion.

Photos 20. & 21. Upland Ponds to north of Boardwalk.

Photo 22. Large Pond and willow Islands north of Pavillion at end of boardwalk.

Photo 23. Pond to Northeast of covered Pavilion.

Photo 24.Downstream Ponds to East which direct flow and empty to Tule Ditch in floods. Remain with water from underground seepage from sandy ridge to right in drier periods.

Photo 25.Granite based trail to first viewing station

Photo 26. West seep pond from first viewing station with boardwalk in background

Photo 27. Trail to second viewing station with permanent signage

Photo 28.East Viewing station bulbout

Photo 29: East pond system looking NW back to covered pavilion

Photo 30:Leopard frogs celebrating first significant rain on site in20 months Sept2009

Current Site Conditions

Aransas County is experiencing growth in population of both permanent and part-time residents. Development pressure poses a serious threat to the quality of the wetlands, wildlife habitats, and water resources that make the region attractive. As more and more land is converted to residential or commercial uses, the potential for water quality degradation is increased. Pollutants that threaten the health of the area's six bays are nutrients and sediments from human activities such as shoreline development, and polluted runoff.

This threat is most obvious in Little Bay, a shallow bay within the corporate boundaries of the City of Rockport that historically has supported a productive fishery, large flocks of wintering waterfowl, and large populations of nesting water birds. Scientists have identified polluted stormwater runoff, a product of urbanization, as a principal cause of declining water quality and loss of wildlife habitat within Little Bay. Studies documented high levels of nitrogen loading from land-based activities, reduced salinity due to stormwater outflows, and persistent eutrophication problems surrounding algal blooms during the summer months. Little Bay has experienced a decline in the once extensive beds of submerged seagrasses. Fishing is less productive, and winter flocks of waterfowl have declined in numbers and diversity in recent years.

Tule Creek is a 2100-acre watershed that carries both stormwater drainage and sewage effluents into Little Bay. The stream drains areas of the City of Rockport, the Town of Fulton, and areas of Aransas County outside the jurisdiction of either municipality. The Aransas County Navigation District (ACND) owns Little Bay by virtue of a land patent from the Texas Legislature, and the ACND cooperates with the City of Rockport in managing Little Bay. Thus, all governmental entities in Aransas County are involved in a cooperative effort to protect Little Bay, and there is consensus among these entities that the Tule Creek drainage and pollution of Little Bay are

top-priority concerns within the framework of the regional program to protect water and improve wildlife habitat described above.

Upper Tule Ditch is an improved earthen drainage ditch that has been modified over the years, including filling and ditch excavating of various areas as well as installing pipe-type culverts. The Tule Marsh East site is located immediately adjacent to SH 35 and Tule Ditch East. The East Tule Ditch is not connected to the Tule Marsh East site and the elevations between Tule Ditch (at tidal sea level) and Tule Marsh East (2.8'-4.0' above sea level) prevent ditch water from entering the marsh.

Clean Water Act 319(h) Nonpoint Source Grant

Aransas County has received a Clean Water Act grant to help improve water quality in Little Bay and subsequently Aransas Bay. The Tule Marsh East enhancement/restoration component of the project involves the enlargement by excavation and deepening of the present upland ponds to depths that are conducive to freshwater wetland ponds and bring additional fresh water from the creek to those ponds. The objective of this component is to create/enhance/restore freshwater wetlands in order to improve water quality conditions downstream.

The Tule East Marsh site contains a system of "ponds" (upland areas where the vegetation was cleared and the land was lowered) and some freshwater wetland areas. Some of the ponds will be excavated to depths that will enable them to maintain a source of freshwater year round. Some of the ponds will be interconnected on a permanent basis and some of the ponds will be interconnected during rainfall events.

The East Tule Marsh site was once an integral part of Tule Lake (until the 1960's). However, it had been drained, around 1964, and was also subject to filling. The City of Rockport owns the site which Aransas first leases and both work cooperatively with the Texas Dept. of Transporation which is

utilized as the entrance to the area. The City has recently purchased the 35 acres surrounding the Tule Lake and downstream portion of the Tule Ditch West. Future projects will involve the construction of a system of stormwater control and wildlife ponds involving various pond enhancement/restoration/ creation designs to help manage Tule Creek and watershed stormwater runoff at the Tule Lake and East Tule Marsh Park. These enhancement/ creation projects would not adversely affect any existing wetland areas, but would involve removing invasive, water consuming Chinese tallow and Brazilian Pepper, and sedimentation material from several silted in areas to create the mosaic of open water habitat, marshes, and riparian woodlands. In addition, the pond system would include an extended detention pond providing infiltration/ recharge with wetlands uptake. This Best Management Practice (BMP) pond system will be designed to provide water quality and habitat benefits. Conceptual planning has initially identified a system or mosaic of cascading ponds that are in succession providing stormwater quality treatment as well as habitat enhancement and restoration in both sites. This aspect of the project involves excavating certain silted-in high areas located within the Tule Lake and Tule East Marsh and also converting existing pools/ponds into designed constructed wetland stormwater controls providing water quality and habitat benefits. The pond system will involve combining smaller pocket ponds (less than 0.25 acres) with a larger extended detention pond (1.0 to 2.0 acres).

In addition, a storm sewer sedimentation trap and infiltration basin and/or other optional primary treatment settling and floatable removal systems will be evaluated and combined in the treatment train. Other optional systems to be evaluated include an "enlarged pipe" setting tank as a "demonstration project". These primary settling treatment systems will provide settling of solids and capture of floatables, and will be constructed upstream and in tandem with the constructed wetland pond system. Stormwater runoff will be conveyed to the East Tule Marsh site from the on site drainage, from

the 36" storm drain along Hwy 35 adjacent to the park which ,at present, drains directly into Tule Creek under the Tx 35 bridge and on to Little Bay, and from pumping creek water up onto the higher marshs adjacent to the creek. These sources of runoff will be evaluated along with other options, ex. low level berms or a natural swale system, etc, involving diverting certain stormwater events from Tule Creek above the East Tule Marsh to the present and proposed enhanced wetlands pond system.

A water well and solar powered pump can be installed which would provide freshwater to the pocket ponds if needed. This freshwater source will allow for some amount of the marsh ponds not filled by underground seep flow to hold water even during relative drought conditions. This will result in the establishment and maintenance of the desired aquatic and wetland vegetative assemblages within this marsh complex, which will aid in filtering sediments and contaminants from storm water and improving water quality downstream and will provide significant benefits to birds and other wildlife.

This project will enhance the site for numerous species of wildlife, particularly resident and neotropical bird species. The Tule Ditch West, Tule Lake West, Tule Marsh East, and Tule Ditch East areas are all components of the same Tule watershed. The Tule Marsh East wetland project will provide a freshwater marsh and upland mosaic that contains diverse habitat types and native vegetative assemblages. The wetland marshes will quickly colonize with wetland plants such as Coastal bacopa, sand spikesedge, many-spiked flatsedge, white-topped umbrella sedge, and lesser duckweed. Over 40 species of plants and grasses have been identified on the site and the transitional areas and upland areas are expected to rapidly recolonize with native grasses, shrubs, and trees currently occurring within the site that are known to improve water quality conditions by trapping sediments and absorbing pollutants.

Stormwater moving through the marsh site eventually discharges into Tule Ditch East, which ultimately empties into Little Bay. The marsh discharge site is located at the bottom end of the marsh complex adjacent to Tule Ditch East. This portion of Tule Ditch contains a retaining wall, which will ensure that Tule Ditch will not experience any erosion once water exits the marsh. The Tule Marsh East project will effectively improve water quality moving downstream into Little Bay.

Conclusion

Thus, the Tule Creek East Marsh Nature Center trails, ponds, and pavilion constructed with a CMP grant, county funds, and donations, has established an immediate benefit for birding, habitat for wildlife, nature education, and stormwater flood management to protect Little Bay. It has become the basis for demonstrating that farther enhancement of this site and sites both upstream and downstream, esp. the silted in, invasive specie covered, Tule Lake West site, where the creek flow and silt from the north and the storm water and sewer plant effluent from the Tule Ditch converge, can be beneficially restored and managed for the benefit of wildlife, habitat, water quality, storm water management, and the enjoyment and education of the citizens and visitors to this area of Aransas county and lead to the restoration of the quality of Little Bay.

This project was implemented by Aransas First, a 501(c)3 Land Trust from the County of Aransas.

This project was made possible by a grant under the Coastal Zone Management of Act of 1972, as amended, and awarded by the Office of Ocean and Coastal Resources Management, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, and administered through the Coastal Coordination Council and the Texas

Coastal Management Program.

It was also made possible by a grant from Aransas County to enhance ecotourism through the restoration and preservation of native habitats typical of the Live Oak Peninsula.