

At the Texas Parks & Wildlife Department (TPWD), it is our goal to restore the land, air and water of the 1,200-acre San Jacinto Battleground landscape to a condition much like it was at the time of the 1836 battle. Of course, a restored site would make it easier for visitors to visualize the battle, but perhaps just as important, it also would preserve an example of a vanishing coastal ecosystem for wildlife for visitors of this and future generations. San Jacinto is one of the few places within an hour's drive of Houston where such a diversity of native habitats and wildlife can be seen. In fact, the native prairie, tidal marsh and bottomland forests of the San Jacinto Battleground State Historic Site are some of the last remaining examples of such habitats in this area. Two hundred years ago, such habitats dominated the coastal plain, but the alteration of natural forces (such as naturally occurring fires), the introduction of exotic species (such as Chinese tallow trees), and the manipulation of the land (such as farming, grazing and building) has drastically altered the landscape.

Restoring the Ecosystem of the San Jacinto Battleground: Land, Air, & Water

by Russ Kuykendall

ABOUT THE AUTHOR: RUSS KUYKENDALL HAS WORKED FOR THE TEXAS PARKS & WILDLIFE DEPARTMENT AT THE SAN JACINTO BATTLEGROUND STATE HISTORIC SITE FOR MORE THAN ELEVEN YEARS IN VARIOUS POSITIONS, RISING TO THE TOP POST IN MARCH 2005. KUYKENDALL EARNED MPA AND BBA DEGREES FROM ANGELO STATE UNIVERSITY.

Land: native tall-grass prairie

In 1836, most of the battlefield was open prairie. Bands of trees lined the bluffs overlooking the marsh and the creeks and gullies that emptied into it, and a few small islands of trees dotted the landscape, but otherwise, the battle was fought in grass “as tall as a horse’s belly.”

Native tall-grass prairie, dominated as it historically was by little bluestem, big bluestem, Indian grass and switch grass, has become quite rare. Less than 1 percent of the original coastal prairie remains. One 100-acre section had been denuded of grasses so completely that we are restoring it by planting seeds collected from a nearby prairie remnant. Many species of wildlife that depend on these grasslands have been extirpated from the area, including the Attwater prairie chicken, black-tailed jackrabbit, Texas horned lizard, American bison, and numerous songbirds.

Today, most of the prairie is being restored through seasonal mowing and rest. Between mowings, the prairie can look quite shaggy as the native grasses are still in the process of replacing ragweed, dewberry and other weedy plants that prospered under past overgrazing and under-mowing. Currently, we mow individual prairie areas each spring and/or each winter. This gives native grasses all summer and fall to mature, flower and produce seed. We hope to incorporate a regular schedule of controlled burning into our mowing cycle to discourage the growth of Chinese tallow and other woody plants and help return nutrients to the soil.

The site is located amidst a heavily industrialized area and has stringent air quality standards, but permits can be obtained from regulatory agencies and nearby cities to proceed with this more “natural” approach to restoration once our staff is trained in the techniques of wild land fire suppression.

Land: bottomland forest

As the coastal rivers meander back and forth in their shallow valleys, they leave behind terraces and floodplains dominated by marshes, swamps and



PHOTOS: RUSS KUYKENDALL

hardwood forests. These riparian forests dissect the coastal prairies, adding tremendously to the diversity of the ecosystem; providing homes and critical foraging habitat to many species of resident and migratory wildlife. These forests, like the marshes and prairies, have been reduced to a small fraction of their original area by logging and clearing. At the east end of the site, there is a small remnant forest with some mature trees up to three feet in diameter. The forest that is visible across the marsh from the trail is younger, having sprung up on soils deposited by dredging throughout most of the twentieth century. This diverse forest has been planted from seeds which floated from upstream forests during floods. Its trees have formed a dense

canopy that provides most of the biological benefits of a more mature forest.

Water: tidal marsh

Between the forested shoreline and the tall-grass prairie lies a tidal marsh, a transition area from uplands to wetlands. Patches of bunched grass—marshhay cordgrass—that is different from both the grass of the open marsh and the grass of the prairie is abundant in this area. Marshhay cordgrass dominates a unique habitat called high marsh. High marsh is sometimes inundated by saltwater—but not on a daily basis, as low marsh is. Most of the San Jacinto marsh may have been high marsh before subsidence lowered the land in the mid-twentieth century.

The tall grass that dominates the tidal marsh today is smooth cordgrass, which



PHOTO: RUSS KUYKENDALL

is specifically adapted to the daily cycle of the tides. At one time, many thousands of acres of cord-

grass marshes lined the coves, flats, channels and floodplains of the Galveston Bay system.

These tidal marshes are extremely important for wildlife and play a role in the life cycle of most commercially important seafood species, including shrimp, crabs, spotted weakfish, red drum and flounder. Many species of shorebirds, wading birds, and resident and migratory waterfowl also depend on these marshes. Other wildlife you might see in the San Jacinto marsh includes river otter, diamondback terrapin, and nutria (an exotic rodent resembling a beaver). Keep an eye out for the cottonmouth! This poisonous water moccasin is a common predator at San Jacinto. Tidal marshes also absorb pollutants and moderate flood waters. Today, anything that impacts tidal wetlands is regulated by the Federal Clean Water Act.

The marsh at San Jacinto was completely converted to open water in the mid-to-late-1900s by subsidence caused by pumping tremendous volumes of water out of the ground for industry. It was restored to a tidal marsh in the 1990s by pumping clean sand and sediment into the marsh from the adjacent San Jacinto River (Houston Ship Channel). A shoreline erosion control project undertaken prior to the marsh restoration ensured the integrity of the shoreline along the San Jacinto River—which served as the northern border of the marsh cell being restored. Crouch Environmental Services secured funding from Texaco, Inc., and, in cooperation with Texas Department of Transportation, TPWD placed rap material along the shoreline.

TPWD led the wetlands restoration project, with help from the U.S. Army Corps of Engineers, Texas Natural Resources Conservation Commission (now Texas Commission on Environmental Quality), U.S. Fish & Wildlife Service, Cemex Docks, Bertron Electric Generating Station (now NRG), the Texas General Land Office, Natural Resource Damage Assessment Trustees, the Port of Houston Authority, Kingfisher Marine, J.D. Ivey and Sons, and Entrix Environmental Consultants. Obviously, the project to restore all of the tidal wetlands at San Jacinto is ongoing.



Industrial neighbors surround the site. Photo: Abbie Salyers

Land: the marsh trail

TPWD submitted a trail project in its 1999 grant cycle for a 700-foot asphalt trail, and by April 2002 it was complete and open to the public. This trail begins at the north side of the drive that circles the monument, then crosses the native prairie and connects to an additional five hundred feet of boardwalk trail that travels across a portion of the restored tidal marsh. An elevated viewing platform was constructed later, along with an additional four hundred feet of boardwalk that now connects the marsh with the hardwood forest. Another elevated viewing platform will be built here later. This American Disability Act (ADA)-accessible trail will then meander along the shoreline of the San Jacinto River and eventually form an approximately three-mile loop once the project is completed.

The trail construction was made possible by a Coastal Management Program grant through the Texas General Land Office, along with grants from the U.S. Fish and Wildlife Service, Galveston Bay Estuary Program (NOAA), and the National Fish and Wildlife Foundation. Partners include the Texas Department of Transportation, Telephone Pioneers of Texas, Environmental Institute of Houston, University of Houston Clear Lake, Duke Energy, Ducks Unlimited, NRG (formerly Texas Genco) Texas Natural Resource Damage Assessment (NRDA) Trustees, the Galveston District Office of the U.S. Army Corps of Engineers, and Harris County Adult Probation Office.

On December 6, 2004, the White House presented the San Jacinto Marsh project with a Coastal America Award, in association with the Texas Corporate Wetlands Restoration Partnership. The award recognized both the effort to restore the marsh and the accompanying trail system.

Air

In 2005, the Friends of the San Jacinto Battleground commissioned Gary Spaid, a chemical engineer with thirty-five years of industrial experience in both large and small companies, to assess chemical and other industrial hazards imposed on the site by its neighbors. A consultant now,



PHOTO: RUSS KUYKENDALL



PHOTO: JOHN FERGUSON



PHOTO: DIANE DeVÖGE



PHOTO: MATTHEW DUPONT



PHOTO: ABBIE SALVERS

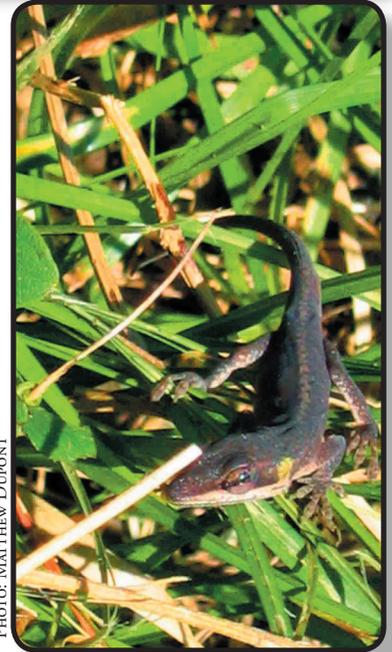


PHOTO: MATTHEW DUPONT



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PHOTOS: JOHN FERGUSON



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PHOTO: STEVE MONDLE



Roseate Spoonbills in flight: nearly 200 birds - including protected and endangered species are found at the site. Photo: Abbie Salyers

Spaid specializes in safety, health, environmental, and community affairs.

Among other things, he advised the battleground to continue—and step up—its participation in industrial and local emergency planning committees, citizen advisory councils, and other safety groups. “Two-way outreach is a crucial part of managing risk,” Spaid said. Steps, many of them simple, are now being undertaken by industry, the park, and its non-profit supporters to foster visitor safety as the site continues to grow in importance and visitation. Just one example of this closer cooperation is an emergency communications network dubbed State Park Industrial Neighbors (S.P.I.N.). The plants advise the park about changes in their operations, and the site advises the plants of high traffic events.

What’s ahead?

A second cell of tidal marsh has yet to be restored. Once archeological survey work is completed and suitable dredge material can be located, we plan to complete work on this important ecosystem. In addition, efforts will continue to revive the original prairie grasses and reforestation along the shoreline of the San Jacinto River to more accurately reflect 1836 conditions.

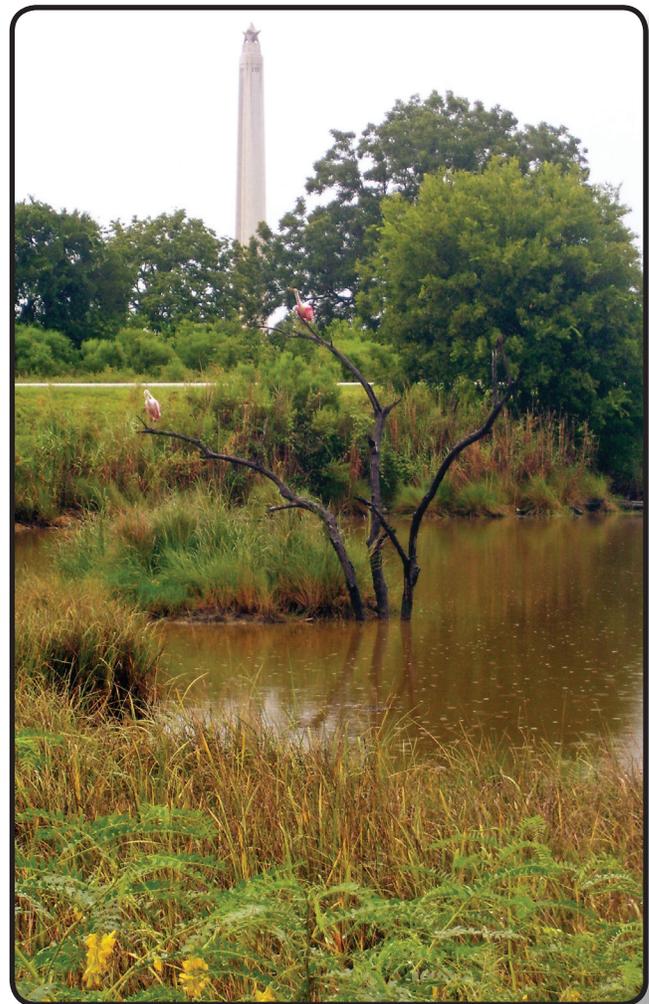
A second viewing platform where the marsh boardwalk connects to the hardwood forest is underway. Concrete footings have been poured and connecting brackets attached for the remaining construction needed for this ADA-compliant feature. Efforts to bid out the project in late 2005 failed due to high material and labor costs associated with both Hurricanes Katrina and Rita.

Work to remove or control non-native and other woody species—as well as noxious weeds found all across the prairie—are ongoing, and seeding of native grasses will also be conducted to ensure the site’s efforts to reflect reports by Texan soldiers in 1836 of “grass as high as a horse’s belly.” The reforestation of the shoreline will involve planting seedlings of trees such as Loblolly Pine, Sweet Gum, Green Ash, Overcup Oak, Willow Oak, Pecan, Black Gum, Bald Cypress, Coastal Live Oak, and other native species.

These specimens will closely reflect the trees found at the time of the Battle of San Jacinto, on April 21, 1836.

TPWD will lead the effort to complete the various battleground restoration projects in cooperation with the park’s support group, the Friends of the San Jacinto Battleground, and with the assistance of partners such as the Shell Oil Company and Ducks Unlimited. Ducks Unlimited and Shell each will fund approximately \$38,000 on the second elevated viewing platform on the marsh trail. Shell is also providing nearly \$10,000 on reforestation and just over \$100,000 for prairie restoration for a total contribution of \$150,000. Later phases will require

just over \$1 million in funding. These include various sections of the three-mile trail loop. They will be segmented into three separate projects to make them both more manageable and affordable. If you would like to help restore this important icon to better teach the children of tomorrow about their Texas heritage, give me a call. ✨



Spoonbills sitting on branches with monument in background. Photo: Abbie Salyers