

**VIRGINIA POINT PENINSULA PRESERVE**  
**INVASIVE SPECIES CONTROL AND WETLAND HABITAT ENHANCEMENT**

**SCENIC GALVESTON, Inc.**

**GBEP Contract Number: 582-5-65099**

**FINAL REPORT**

**August 12, 2005 – May 31, 2007**

## **Executive Summary**

This project involves eradication / suppression / management of exotic and invasive plant species in the high-visibility 1500 acre Virginia Point Peninsula Preserve (Galveston Bay), Galveston County, Texas, owned and managed by SCENIC GALVESTON, Inc. (SG). This sector of the greater SG conservation holdings is comprised of primarily coastal prairie and associated palustrine wetlands, plus some high marsh habitat. Project partners include: USFWS Texas Coastal Program, The Gulf of Mexico Program (NOAA), the Galveston Bay Estuary Program, and SG. The general goals of the project include: 100% eradication of large Chinese tallows, plus long-term control (management) of tallow seedlings; 100% eradication of Deep-rooted sedge and Brazilian pepper (if present); suppression of overabundant invasive native shrubs Baccharis and Iva; and some (lowest-priority) suppression of spreading Salt-cedar colonies, coupled with elimination of new solitary Salt-cedars found in tallow and other work areas. Work was primarily performed on a contract basis over a 3 ½ year period, but consideration was given, during the grant period(s), to enabling effective volunteer-led management of the restoring grassland through the purchase of equipment and supplies for use thereafter.

## **INTRODUCTION**

Invasive species cause billions of dollars in damages to industry, agriculture, rangelands, and waterways annually. Many conservation biologists consider invasive species as the second most serious threat to wildlife after habitat destruction. In fact, the U.S. GAO recently identified invasive species as a national priority, and noted the need for federal leadership in invasive species management.

The SCENIC GALVESTON (SG) Preserve, including, to date, the John O'Quinn Estuarial Corridor and the Virginia Point Peninsula Preserve, is a Gulf Ecological Management Site (GEMS) within the Galveston Bay estuary. The SG Preserve is located along I-45 at Virginia Point, the convergence of Galveston Bay and West Bay. The high-visibility preserve is traversed by tens of thousands of commuters and visitors daily. See attached map.

The SG Preserve includes 2400 acres of a rich diversity of coastal habitats, the majority of which are wetlands, including intertidal marsh, high marsh meadows, and palustrine wetlands, as well as tidal flats, shallow submerged areas, and oyster reefs on and adjacent to the property. Coastal prairie, considered by the USFWS to be the most endangered habitat in N. America, comprises much of the upland area, pockmarked with depressional wetlands associated with ancient riparian features, and interspersed with oak motte areas and scattered trees. Protecting five miles of marsh and oyster reef shorelines, the preserve bridges Galveston and West Bay, and creates an important habitat corridor in a rapidly urbanizing area. Working with a variety of partners, using heavy earthmoving techniques followed by volunteer planting, SG has restored 80 acres of intertidal marsh within the preserve since 1999.

In aggregate, these restored / restoring / pristine habitats support a tremendous quantity and diversity of commercially and recreationally important fish and shellfish, their juveniles and larvae, reptiles, amphibians, mammals, and resident and migratory birds. Additionally, wetlands and upland buffer areas play a critical role in the quality of water ultimately reaching Galveston Bay, which greatly impacts its productivity. Consequently, the SG Preserve is an integral part of the Galveston Bay estuarine system, supporting important commercial and recreational fishing and tourism industries, which combined, contribute hundreds of millions of dollars annually to the local economy.

However, the preserve's habitat diversity is significantly threatened by invasive species. Chinese tallow (*Triadica sebiferum*) and salt cedar (*Tamarix spp.*) have degraded the value of numerous freshwater and brackish wetland areas. Deep-rooted sedge has become established in several palustrine wetland areas, and is poised to spread widely if not managed soon. Brazilian pepper tree (*Schinus terebinthifolius*) has not yet been found in the preserve, but is found in nearby areas. Each of these species is considered by local experts to be very high-risk invasive species. Eastern baccharis (*Baccharis halimifolia*), although native, has impacted many areas within the high marsh meadows, previously dominated by saltmeadow cordgrass (*Spartina patens*) and gulf cordgrass (*Spartina*

*alterniflora*). Numerous exotic grasses and forbs have become established in coastal prairie upland and wetland areas.

Invasive species have become well established on the site due to the human suppression of natural processes such as fire and grazing by large quadrupeds, which tend to protect the health and diversity of the native plant community to which native fish and wildlife have adapted to utilize. Through this project, SG and project partners will work to control invasive species to maintain diverse native plant and wildlife communities.

Much of the 1500 acres within the Virginia Point tract comprise a single watershed, draining through a high marsh complex into a central tidal channel connecting the upper preserve with the lower 900 acres of intertidal marsh (O'Quinn Corridor). Consequently, the upper Preserve, though largely palustrine, has a tremendous impact on the water quality, and thus the health and productivity, of the tidal portions of the Preserve. In addition, periodically inundated during high tides and storm events, the Virginia Point high marsh complex serves as essential habitat for important marine organisms, including NOAA Trust resources. The attached map shows habitat types and coverage.

The goal of this project was to protect and enhance the rich diversity of habitats within the SG Nature Preserve, a Gulf Ecological Management Site, by controlling invasive species in the diverse wetland and coastal habitats within the Preserve, involving local community members.

The specific objectives for this project were to:

- Objective 1 remove invasive species impacting sensitive habitat areas
- Objective 2 reestablish, where necessary, native vegetation in treated areas
- Objective 3 involve local community to educate citizens on the functions and values of wetlands and coastal habitats, and the threats posed to them

This project implements several high-priority actions in *The Galveston Bay Plan*, the Comprehensive Conservation and Management Plan for Galveston Bay.

## **PROJECT METHODOLOGY**

### **PHASE 1 - SG / USFWS partnership**

This project has been underway since Fall 2004, when SCENIC GALVESTON, Inc. (SG) began work with \$30,000 assistance from the USFWS Texas Coastal Program. At that time, we also began discussions with the Gulf of Mexico Foundation (GMxF) and Galveston Bay Estuary Program (GBEP) about continuing the work into 2007.

The FWS funds paid for approximately \$21,500 of (mostly) tallow control work performed primarily by Peterson Forest Land Management, using a "hack and squirt" technique to treat individual tallows on about 50 acres of heavily infested acreage at the north end of the preserve ("the slough"). Dead and dying tallows were left to stand and topple naturally.

The remaining \$8,500 of USFWS funding was spent in Fall 2005 (and into 2006) by the project team to bring Peterson back for warranty and a relatively minor amount of new treatment areas (mostly foliar treatment of small tallow saplings) and to acquire spray and other equipment to enable SG volunteers to begin ongoing management of the primary kill. During this second season, we also initiated control of invasive exotic Deep-rooted sedge. Several volunteer work-days were also held to experiment with manual control of DR Sedge, involving cutting and removal of seed heads in late summer to minimize spread of new sprouts. Volunteers also sprayed select plants with Roundup to work toward learning to permanently control this plant in the preserve, where infestation is, to date, relatively minor.

## **PHASE 2 - SG / GBEP / Gulf of Mexico Foundation partnership**

GMxF: In January of 2005, a 2-year \$50,000 grant from the Gulf of Mexico Foundation became active. GBEP provided the bulk of the required match for this grant (\$45,000). SG provided the remainder - \$5,000 in promised volunteer in-kind labor toward the project. Throughout 2005, volunteers worked at informal test plots in the preserve on a variety of experimental projects including manual removal of new tallow seedlings, individual treatment of isolated pockets of invasive *Baccharis* and *Iva* shrubs, etc. In fall 2005, Peterson also continued warranty work of previously treated 'hack and squirt' tallows, added some new treatment areas previously missed in the north sector of the preserve and began foliar spraying new seedlings appearing in previously treated sections of the project. Peterson also began pushing new foliar spray areas southward in the preserve. (This work continued through January 2006.) In total, new work areas - again, treated with a combination of hack and squirt and foliar spray - added up to about 17 acres. (The new tallow areas are dispersed in scattered pockets across the greater preserve, as opposed to "the slough", where trees were confined in an old, low-slung, bayou scar, occupying hydric soils at much higher density than elsewhere in the preserve.)

In September 2005, the VPPP Preserve also experienced a significant prairie burn, encompassing about 891 acres of the southward 1000+ acres of the preserve. Although the fire was accidental, SG requested that it be left to burn, which largely happened. This burn was at no cost to the project. (Using a range of \$25-35/acre figures provided by Peterson and others, SG values the theoretical cost of the burn at approximately \$27,000.) It was, however, highly beneficial to preserve grasslands, particularly with respect to our goal of native brush suppression.

The burn did have a downside, however, as regards our timely grant expenditures, in that many of the planned new treatment areas in the immediate area of the burn could not be readily re-approached until late fall of the following year, after any new growth in the burn areas had hardened off. This necessitated a scramble at year-end to close out the GMxF grant by 12.31.06, as well as an extension request to GMxF for the expenditure of the required GBEP grant into 2007, and a very short timeline to utilize the GBEP grant, in turn, by end May 2007. This was further complicated when the City of Texas City denied us the issuance of any burn permits at year end and into the early spring 2007. Nonetheless, by end of year 2006, another 20 acres approximately was successfully treated as the GMxF

grant ended. In addition to control of scattered-stand tallow and discovery and eradication of scattered pockets of Deep-rooted sedge, Peterson also performed some limited and experimental cut-stump treatment of Salt-cedars the team identified as "outlier" stands. Our GPS mapping is still underway on this portion of the project. Final acreage may vary by a few acres - probably upward.

The GBEP grant project was, in effect, compressed into the 5-month time period between January and May of 2007, when the grant ended. Where GBEP had hoped to contribute burn support, this was unfeasible, as described above. After a series of late-2006 meetings with Armand Bayou Nature Center, Peterson, and USFWS Brazoria-San Bernard Refuges burn personnel, we determined that our best course of action to complete the grant was to mow areas of the preserve that had been left untouched by the burn, with the goal of opening up these largely very brushy areas and encouraging grass re-growth ahead of a future (late 2007 - early 2008) controlled burn or burns, this time with USFWS assistance. The target area was the northern 300-400 acres that heretofore had been tallow-treated, but not brush-suppressed. Several contractors were interviewed, and Troy Bellmyer was selected to begin the brush-hog project, with instructions to avoid wet areas, treated dying tallows, pimple mound sites with desirable native shrubs, native trees and so forth. He was also asked to avoid healthy expanses of grasses where not encumbered by an overabundance of woody species. Bellmyer worked to maximize the acreage covered as much as possible, by setting his mowing blades high and embracing the patchwork effect that was the inevitable result of this strategy. By end of May 2007, brush-suppression was complete on approximately 200 additional acres of the preserve. Discussion with the USFWS refuge burn teams to develop our ongoing burn plan is underway.

Finally, in the last days of the grant, SG worked with Peterson and Bellmyer on purchase of a stockpile of herbicide (\$3700) and some needed small equipment and protective gear for volunteer use in maintaining the bulk eradication / suppression work performed during the open periods of these grants. This material is housed at SG's newly refurbished field house / wetland nursery (evolving with some assistance from Reliant Energy). Regular Fall 2007 Invasive Species workdays are being planned.

GPS site mapping of all the control areas is also being refined for ongoing site management and monitoring use.

## **PROJECT RESULTS**

This project was an excellent first step toward achieving the goal of restoring the Virginia Point preserve to approach as nearly as possible its native state. Of 1500 total acres, the project treated / suppressed undesirable and/or overabundant woody vegetation on approximately 1178.5 acres (pending final GPS mapping work underway). Our overarching (possibly ambitious) goal was to try and hit the whole preserve, where treatment was needed, and we have done that. The project dramatically altered the landscape, and set these tracts up for continued burns, prescribed mowing etc. - ongoing grassland management.

## **PROJECT CONCLUSIONS AND LESSONS LEARNED**

**CONCLUSION:** While SG is definitely in need of a long term plan of habitat management and enhancement for the prairie portions of our preserve in particular, it is also, in the case of invasive exotic species, perfectly possible to pick obvious targets and attack, without benefit of a lot of "science". Get the major seed sources as quickly as possible, then figure out the long-range picture.

**CONCLUSION:** A happy relationship with a contractor with an educated eye is very important. Both our mowing contractor and our herbicide applicator learned a lot on our job, and both taught us a lot, as well. Both have expressed interest in continuing with us long-term, and both are also receptive to working with us on long-range plans that involve volunteers. This is important - the contractors now know our site as well, if not better than all of our board and regular volunteers, with a few exceptions.

**LESSON:** Volunteers were VERY daunted by the magnitude of the proposed "first kill" project. However for project maintenance, where vigilance is paramount, we believe volunteers will probably be suitable, particularly in the case of DR Sedge and Brazilian Pepper, and even seedling tallows over time. Such was our thinking on our various equipment purchases - poorly equipped volunteers do not have fun, and they do not return - we need a dedicated cadre of eager people. (This lesson is still evolving, but groups are currently gravitating to us in a good way.)

**LESSON:** Deep-rooted sedge eradication lends itself to volunteer labor, cutting seed heads and applying herbicide to the remaining foliage. The volunteers learn about a bad plant with which most are unfamiliar, and for isolated stands of sedge, the technique is extremely effective.

**LESSON:** Don't be afraid of fire, but don't burn unless you mean to....

**LESSON:** For the 'first run' kill of brushy species, especially on land you do not know well, rent heavy equipment, do not buy it. The equipment takes a huge beating. Once you have a plan down and the basis laid for ongoing control work, consider buying.

**LESSON:** Do not bother starting invasive species removal unless you plan on sticking with it. We are in for the long haul here.

**LESSON:** Leave dying tallow trees to fall naturally and rot away, where feasible. It is unsightly, and it poses some problems for site access for 2-3 years, but the evolving habitat is interesting, and there is some satisfaction from watching the trees slowly exit.

**LESSON:** Non-selective herbicide is okay, handled with precision.

**LESSON:** NO vehicles or foot traffic through seeding Deep-rooted sedge infestations. Mowing and other equipment used on site should be cleaned beforehand (eg: pipeline ROW).

**LESSON:** Hack and squirt cuts are most effective at near-ground level.

**LESSON:** Blue dye is critical for tracking work progress.

**LESSON:** For a project of this magnitude (many acres, several control strategies, multi-species, multi-season, new seedlings) the work is difficult to bid. Break down the project into smaller pieces, and work closely with the contractor sector by sector.

**LESSON:** EXPECT DELAYS and be flexible. In this case, as described above, the prairie fire, though beneficial, caused delays in subsequent treatment of plants in the area of the burn. In addition, the project has been refused additional burn permits thereafter. This forced us to a brush-hog plan for unburned acres, which was probably ultimately for the best anyhow. Also, for this type season-sensitive project, expect weather delays, both for herbicide application (short-term) and to minimize rutting (can be long-term delay).

**CONCLUSION:** Not for the faint of heart, but worth it in the long-run.