Final Report

on

Invasive Species Control Project

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Prepared for:

GALVESTON BAY ESTUARY PROGRAM

A PROGRAM OF THE TCEQ

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TABLE OF CONTENTS

Invasive Species Control Project

Executive Summary

Invasive species are species that establish and successfully reproduce in regions where they do not naturally exist. The impacts of invasive species can be ecologically and economically devastating to a region and the Houston-Galveston metropolitan area, including the Lower Galveston Bay Watershed, is no exception.

During the 2001 review of the priorities and goals established in *The Galveston Bay Plan,* invasive species were identified as the second highest priority problem behind habitat loss. In 2004, the Galveston Bay Estuary Program (GBEP), the Houston Advanced Research Center (HARC), and the Environmental Institute of Houston at the University of Houston-Clear Lake (EIH-UHCL) completed an invasive species risk assessment for the Lower Galveston Bay Watershed. The project identified 296 species (including166 plant species) as current and potential invaders of the Lower Galveston Bay Watershed. Each species was then ranked according to ecological risk by a group of experts. The risk assessment also outlined a series of recommendations to enhance prevention and control of invasive species.

Introduction

This project involves invasive species control at several sites within lands under conservation management, addressing three of the highest risk species identified in the risk assessment described above: Brazilian pepper tree (GBF's Sweetwater Nature Preserve), Chinese tallow (Armand Bayou Nature Center), and water hyacinth (Armand Bayou).

Brazilian pepper tree, *Schinus terebenthifolia,* already constitutes a considerable threat to barrier island habitats along the Texas coast. It is considered by many experts to be among the world's worst invasive species. It is of little value to local wildlife, and quickly outcompetes beneficial native vegetation, displacing diverse natural areas, and creating a monoculture of this noxious plant. The species has caused immense ecological damage to temperate and subtropical South Florida, which is currently waging a war to control the nuisance, and is established populations along the lower Texas Coast. It has the potential to have similar impacts along the upper Texas Coast. A relatively small area on Galveston is affected by Brazilian pepper tree. Since the area is still reasonably small, this project represents an opportunity to implement a control program with the potential to head off a much larger problem.

Resource experts have observed individual trees and small clusters of the Brazilian pepper tree, as well as Chinese tallow and other invasive species in the Sweetwater Lake Nature Preserve on Galveston Island, and adjacent lands. This project will involve destroying Brazilian pepper trees found in the project area, and removing other invasive species from as great an area as possible within the project budget.

Chinese tallow, *Sapium sebiferum*, is described by area resource experts as having severe impacts on various habitats in the Galveston Bay watershed, including valuable freshwater wetland habitats within rapidly disappearing coastal prairie areas, oak mottes, and interdune swales. Chinese tallow is already well-established in many locations around the Galveston Bay watershed.

Armand Bayou Nature Center has a significant Chinese tallow problem, and not surprisingly, an active control and land management program. This grant will support the Nature Center's control efforts, specifically targeting a 7-acre study site, heavily infested with tallow, that provides a significant seed source to nearby grassland areas under management.

Water hyacinth, *Eichhornia crassipes*, is a free-floating perennial plant that can grow to a height of 3 feet. After aquatic plants die, their decomposition by bacteria and fungi provides food (called "cetritus" for many aquatic invertebrates. Water hyacinth has no known direct food value to wildlife and is considered a pest species. The plant also tends to clog waterways, posing navigation hazards.

Armand Bayou has a considerable water hyacinth problem during the growing season. Galveston Bay Estuary Program, the Armand Bayou Nature Center, and Texas Parks and Wildlife have partnered for many years to control water hyacinth in the bayou. This grant will support partnership efforts to control the noxious plant.

Project Methodology

Under this grant agreement two separate projects were undertaken.

One project was for invasive species treatment of Chinese tallow and water hyacinth at Armand Bayou Nature Center (ABNC). GBF reached an agreement with ABNC which allowed ABNC staff to manage and coordinate all on ground activates (seek, hire, oversee contractor work, etc) for the project and that GBF would administer the grant funds (pay contractors, etc). With this in mind this portion of the report will concentrate on the second project and details concerning the ABNC with be provided in conjunction with this report.

The second project was for the treatment of Brazilian peppertree on and surrounding GBF's Sweetwater Nature Preserve, on Galveston Island. GBF in partnership with GBEP and TPWD originally treated for Brazilian peppertree in this area in 2005. Due to a lack of funding the initial treatment was not monitored and re-treated as needed on an annual basis. Re-growth from the initial treatment was tremendous. It is thought that the re-growth at this site is in the form of new plants from seed, root sprouts, and missed plants in initial treatment. This project treated areas that were initially treated in 2005 as well as new areas not treated in previous years. GBF retained the services of the contractor that did the initial treatment in 2005, Peterson ForestLand Management, Inc. (Chris Peterson).

GBF staff met Chris Peterson at Sweetwater Preserve in early 2008. This meeting was to observe the areas treated in 2005 and discuss all areas that needed to be treated. From this meeting Mr. Peterson prepared for treating Brazilian peppertree via basal bark treatment later in the year.

In late July 2008 Mr. Peterson and his crew treated approximately 30 acres for Brazilian peppertree in an area just north of Moody golf course. GBF visited the site a month later and observed that the treatment was successful. Due to hurricane Ike and trouble finding field crew labor no other treatment was completed in 2008.

GBF met with Chris Peterson again in the spring of 2009 to observe the area treated in 2008 and make a plan to continue with treatment that was delayed from 2008. Looking at the area treated in 2008 both GBF and Mr. Peterson were satisfied with the results of the previous treatment. Walking the area there were some small plants present sprouting from roots and presumably from seed. There were also some larger plants that were missed. In this particular area the Brazilian peppertree was located areas of concentrated salt cedar (another invasive)

which made the terrain tough for the crew to see all of the targeted species. This area was re-treated during the 2009 treatment. It should be noted that the control of invasive species, in particular Brazilian peppertree is not a one and done treatment cycle. It is estimated to take 3-5 years of consecutive treatments to successfully control the species.

In addition to the 30 acres initially treated in 2008 and re-treated in 2009, approximately 28.6 acres were treated in the 2009 treatment cycle. A total of 58.6 acres were treated in during the project period.

All peppertree treatment was via basal bark application of 10% Garlon 4 (or equivalent) mixed with basil oil.

Project Results

At Armand Bayou Nature Center 3.5 acres of Chinese tallow was eradicated an approximately 20 acres of the bayou was treated for water hyacinth.

Over the years of 2008 and 2009 approximately 58.6 acres was treated for Brazilian peppertree on and surrounding Sweetwater Nature Preserve. Also approximately 30 acres of this that was initially treated in 2008 was re-treated in 2009.

Moving forward
GBF will closely monitor the treated areas and seek additional funding to insure re-treatment can be done over the next several years.

Project Conclusions and Lessons Learned

After viewing Brazilian peppertree areas that were initially treated in 2005 and seeing the re-growth that occurred over a short period of time, it was learned that when dealing with this species it is imperative that funding be in place for follow up treatments. A treatment plan for invasive species should adequately plan and prepare for multiple treatment cycles over a 3+ year span dependent upon the species. Brazilian peppertree grows rapidly and without yearly treatments populations can bounce back in the blink of an eye. This fast growing and fast recruitment is after all what makes most invasive species a threat to native habitats and why they need to be controlled.

Also, Brazilian peppertrees were observed after saltwater inundation caused by hurricane Ike. While the salt water contact had a negative impact on other species of woody plants it did not have such an impact on Brazilian peppertrees. When observing peppertree shortly after Ike parts of the peppertrees were in fact brown, but green was quickly returning. At one point it seemed in the treatment area the only thing green after Ike were peppertrees.

Project Funding:

Partner	Contribution	Contribution Type
GBEP (TCEQ) for Brazilian peppertree	$8,000	State
RAE-NOAA	$12,500	Federal
GBEP (TCEQ) for ABNC	$16,000	Federal
Total	**$28,500**	

*The above totals do not reflect in-kind services provided by Peterson ForestLand Management, Inc. up to $6,500.

Enclosures:

ABNC report
Brazilian peppertree treatment area map
Brazilian peppertree removal photos