



# Challenger Seven Memorial Park Habitat Restoration Project Final Report

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## Executive Summary

The Challenger Seven Memorial Park Habitat Restoration Project focused on restoring forested riparian habitat along Clear Creek in Harris County, Texas. Over the course of the project, restoration efforts successfully treated 76.91 acres of riparian habitat, significantly improving ecological health and biodiversity.

The restoration process involved a two-phase clearing approach to effectively reduce invasive species. The first clearing removed the majority of invasive vegetation, while the second targeted any remaining, untreated, or re-emerging growth. This strategic approach ensured a minimum 90% reduction in invasive species cover, with many areas exceeding this benchmark. The project specifically focused on the removal of invasive woody overstory and understory species, as well as invasive vines in problem areas.

Work was carried out using contract labor and young adult conservation crews, fostering workforce development while advancing conservation goals. In the final phase of the project, the Bayou Preservation Association developed and installed an immersive audio tour, accessible via QR codes on interpretive signage throughout the park. This engaging educational tool enhances visitors' understanding of the critical role of wetlands and the impact of native and invasive species.

Additionally, during a the previous phase, the project included two hybrid workshops, providing a platform for stakeholders and the community to learn about the restoration process, watersheds, and broader habitat conservation efforts. Through these initiatives, the project not only restored valuable riparian habitat but also promoted environmental awareness and stewardship for future conservation efforts.

## Introduction

The Houston-Galveston region was historically part of the Gulf Coast Prairie ecosystem, characterized by vast grasslands intersected by riparian forests along the region's many bayous and streams. These riparian areas are **biodiversity hotspots**, providing essential food, shelter, and ecological functions for a diverse range of plant and animal species. **Challenger Seven Memorial Park** retains remnants of this historic prairie ecosystem and is home to extensive **riparian forest lands** along Clear Creek.

Prior to restoration efforts, much of the park's riparian habitat had become **densely overrun by invasive species** such as **Chinese tallow** (*Triadica sebifera*), **Ligustrum**, and **Privet** (*Ligustrum sp.*). These aggressive invaders outcompeted native vegetation, leading to **biodiversity loss, habitat degradation, and reduced ecological function**. The resulting decline in native plant diversity not only impacted wildlife food sources but also weakened the ecosystem's ability to **improve water quality, prevent erosion, and maintain soil health**. The **Challenger Seven Habitat Restoration Project** was designed to mitigate these impacts, **restore ecological resilience, and enhance the natural functions** of these vital riparian habitats.

Public engagement and education play a critical role in habitat restoration, especially when it involves **the removal of large invasive trees and herbicide treatments**. Without proper outreach, these necessary interventions can be misinterpreted as simple tree removal rather than **strategic ecological restoration**. To foster long-term public understanding and support, the **Bayou Preservation Association** developed an **immersive audio tour**, accessible through QR codes placed on interpretive signage throughout the park. This resource educates visitors on **watersheds, habitat restoration, and the impacts of invasive species**, ensuring that the value of these restoration efforts is understood well beyond the project's completion.

## Project Significance and Background

The Challenger Seven Memorial Park Habitat Restoration Project plays a crucial role in restoring riparian habitat along the shores of Clear Creek. Although the area was densely populated with invasive species, it remained less degraded than many other riparian zones in the region. The presence of native plant species provided a strong foundation for natural recruitment and regeneration following the removal of invasive competitors, making this site an ideal candidate for restoration.

Healthy riparian zones are essential for maintaining water quality and ecological stability. These habitats help regulate water flow, slowing the movement of runoff from surrounding uplands into the creek, which can reduce erosion and mitigate flooding. The reestablishment of a diverse native understory strengthens soil retention, captures sediments and debris before they enter the waterway, and enhances natural nutrient filtration, ultimately improving the overall health of Clear Creek.

The restoration methods implemented at Challenger Seven are based on years of experience and refinement, ensuring their effectiveness for future projects. While this site represents a small portion of the broader riparian network, its restoration contributes to habitat connectivity and long-term ecological resilience across the region. Additionally, this project enhances the recreational experience for park visitors by improving visibility of Clear Creek, reopening overgrown trails, and increasing wildlife diversity, fostering a richer and more engaging natural environment.

The Challenger Seven project also aligns with goals from the following approved state and regional plans:

- ▶ **Texas Coastal Resiliency Master Plan:** goal of enhancing the habitat and infrastructure in our coastal communities
- ▶ **RESTORE Comprehensive Plan DRAFT 2022 Update:** Objective to restore, enhance, and protect habitat
- ▶ **Galveston Bay Plan 2<sup>nd</sup> Edition:** HC-2, Habitat Restoration; HC-3, Habitat Enhancement; SC-2, Invasive Species Management

# Methods & Results

## Habitat Restoration

The Bayou Preservation Association secured contract labor through a competitive RFP process, selecting RES for the final phase of invasive species removal and habitat restoration. RES was chosen for its extensive expertise in plant identification and removal across Texas. Additionally, Texas Conservation Corps work crews were contracted to assist RES in the removal and treatment of invasive species. Both RES and Bayou Preservation Association provided hands-on training and supervision to ensure work crews were well-equipped with the necessary skills for accurate species identification and effective removal techniques. Through these efforts, a total of 76.91 acres of riparian habitat was successfully restored (Appendix 1).

The removal process utilized a combination of hand tools, including chainsaws, hand saws, pole saws, and loppers, to cut invasive plants. To prevent regrowth, all cut plants were treated with water-safe herbicides in a targeted manner.

To ensure effectiveness and long-term success, removal and treatment efforts followed a structured methodology, which was documented in a post-maintenance plan and provided to county staff in 2022 for continued maintenance. The methodology included:

1. Marking Invasive Plants – Experienced practitioners marked invasive plants with paint, ensuring easy identification for less experienced young adult crew members.
2. Cutting & Stump Management – Marked plants were cut while leaving part of the stump visible, preserving paint markings to guide herbicide application.
3. Debris Clearing & Preparation – Leaf litter and cut debris were removed from the base of the plant, and the stump was further trimmed to expose as much of the cambium layer as possible.
4. Herbicide Application – A carefully controlled application of herbicide was sprayed directly onto the freshly exposed cambium layer, ensuring effective absorption.
5. Ongoing Monitoring & Maintenance – Previously treated areas underwent regular mop-ups to check for missed plants, partially treated vegetation, or newly emerging seedlings, preventing reinfestation and ensuring restoration success.



# Community Outreach, Education, and Engagement



## Interpretive Signage (Installed 2022)

Bayou Preservation Association commissioned local artist Sarah Welch to aid in the design of three interpretive signs. These signs provide environmental interpretation covering the topics of native species, invasive species, and the anatomy of a watershed. Bayou Preservation Association then solicited feedback on the signs from HCP2, GLO, and internal committees to arrive at the final design and wording. The signs have been permanently installed throughout the project.

## Self-Guided Audio Tour (Installed 2025)

Bayou Preservation Association installed a 3-part series of in-depth exploration of the interconnected components of wetland ecosystems, focusing on the impact of invasive species and how their removal allows native species to thrive in their natural habitat. Accessible through QR codes and our website, the tour encourages visitors to explore the park at their own pace, deepening their understanding of native species conservation and the delicate balance of these ecosystems. By providing an auditory learning experience, the tour expands the reach of the project, making the park more inclusive and enriching for all visitors.





## **Aquatic Milkweed (*Asclepia perennis*) appearing after invasive clearing**

## **Results and Observations**

The restoration project at Challenger Seven Memorial Park has been a success. Our work crews have been able to significantly decrease the number and density of invasive plants in the work area to below 10%, opening up space for the large native trees already in place and increasing light availability for native understory plants and seeds. The youth conservation crews greatly assisted RES in removal of large woody invasives, increasing the speed and efficiency with which we could combat many of these heavily infested areas.

The Challenger Seven riparian restoration project resulted in the improvement of 76.9 acres of habitat. We have begun to see the re-emergence of native species by natural recruitment and are optimistic about the return of native biodiversity with continued maintenance of the site. Native plants that we have observed re-emerging during this project include: Aquatic Milkweed (*Asclepia perennis*), Ironweed (*Vernonia sp.*), Yellow Passionflower (*Passiflora lutea*), and Downy Lobelia (*Lobelia puberula*)

## **Lessons Learned and Post-Treatment Assessment**

The Challenger Seven Habitat Restoration Project provided critical insights into best practices for riparian habitat restoration while demonstrating the ecological benefits of invasive species removal. Key lessons learned throughout the project include:

### **1. Effective Collaboration Enhances Outcomes**

Partnering with youth conservation crews and experienced contractors, including EBR and RES, significantly improved the efficiency and effectiveness of invasive species removal. The combined efforts allowed for the successful removal of large woody invasive species, including Chinese Tallow, Wax Ligustrum, and McCartney Rose, which had heavily infested certain areas. Future projects should continue to leverage a mix of skilled contractors and conservation corps crews to balance technical expertise with workforce development.

### **2. Strategic Invasive Species Removal Supports Native Habitat Recovery**

By implementing a multi-phase approach, work crews successfully reduced invasive plant cover to below 5%, creating vital space for

existing large native trees and increasing light availability for native understory plants and seeds. This restoration strategy ensures long-term ecological resilience by promoting natural regeneration of native species. Future projects should continue to prioritize follow-up maintenance and monitoring to prevent reinfestation and encourage native plant recruitment.

### 3. Comprehensive Training is Essential

Providing hands-on training and direct supervision for work crews ensured accurate invasive species identification and removal. The use of paint markings for invasive identification, structured removal protocols, and targeted herbicide application were key to maintaining consistency and effectiveness. Future projects should continue to emphasize pre-project training sessions and ongoing field supervision to optimize restoration outcomes and the investment in workforce resilience.

### 4. Public Engagement is Critical to Project Support

Restoration work that involves tree removal and herbicide application can sometimes be misinterpreted by the public. To address this, Bayou Preservation Association developed an immersive audio tour and interpretive signage, which provided educational context about the project and the importance of riparian restoration. Future initiatives should integrate early and ongoing public education efforts to build lasting community investment in restoration projects.

### 5. Riparian Restoration Provides Tangible Ecological and Recreational Benefits

The removal of invasive species and the restoration of native habitat resulted in increased wildlife activity, with sightings of alligators, Great Egrets, and a variety of pollinators returning to the area. Additionally, the project improved public access to Clear Creek, reopened overgrown trails, and enhanced the overall aesthetic and ecological value of the park. These benefits highlight the importance of integrating ecological restoration with recreational use considerations to maximize the impact on both wildlife and park visitors.

By applying these lessons to future restoration efforts, Bayou Preservation Association can continue to refine its approach, enhance habitat resilience, and strengthen public engagement in conservation initiatives.

# Appendix 1. Final Map of Area Treated

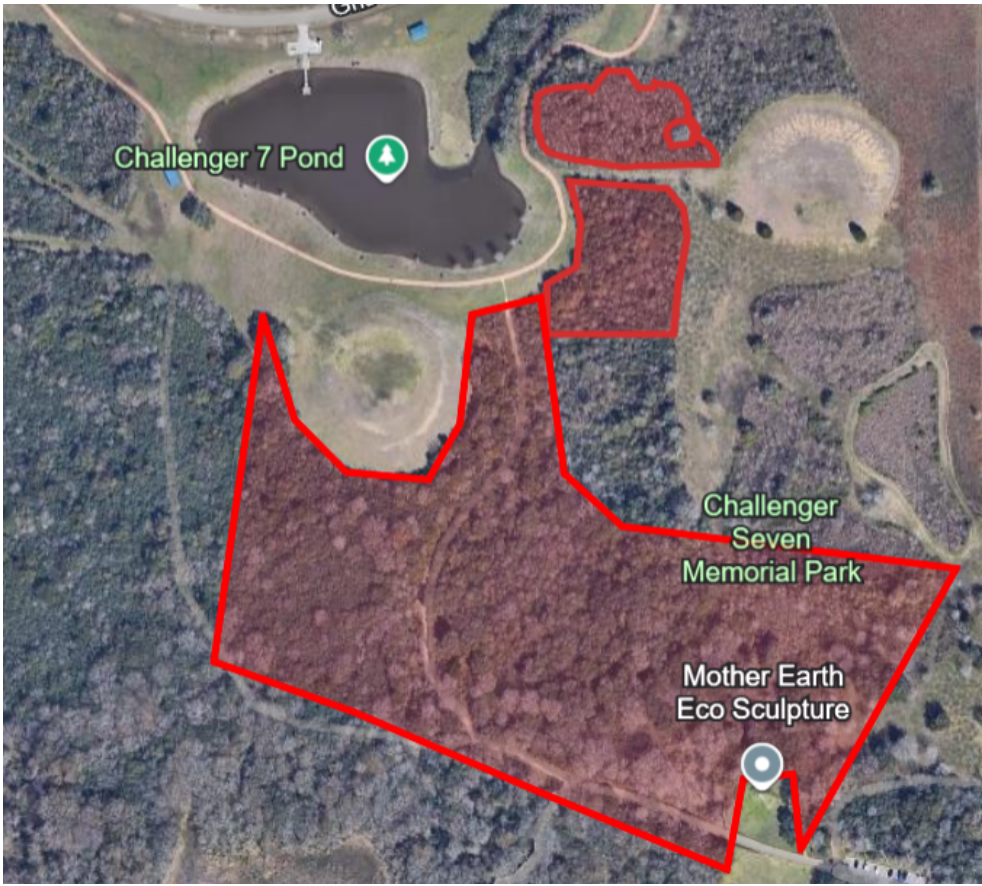


Figure 1. Map of Challenger Seven Habitat Restoration Work Site

# Appendix 2. Photos of Invasive Removal



Figure 2. Treated large, multi-trunked Chinese Tallow Tree



Figure 3. Large number of treated stumps



Figure 4. Large felled Ligustrum trees and treated stumps



Figure 5. TxCC Crew Members



Figure 6. Treated Cat's Claw Vine



Figure 7. Treated Stumps



Figure 8. Treated Japanese Climbing Fern



Figure 9. Large Cut and Treated Ligustrum

## Appendix 3. Benefits of Native Species with QR Code



## Appendix 4. What Is So Bad About Invasive Species? with QR Code





# Appendix 5. Anatomy Of A Watershed with QR Code

