Challenger Seven Memorial Park Habitat Restoration Project

Final Report

Figure 1. An example of the restoration area at Challenger Seven Memorial Park

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Abbreviations

EBR	EBR Enterprises
GBEP	Galveston Bay Estuary Program
TCEQ	Texas Commission on Environmental Quality
TxCC	Texas Conservation Corps

Executive Summary

The Challenger Seven Memorial Park habitat restoration project focused on the restoration of 48.9 acres of forested riparian habitat along Clear Creek in Harris County, Texas. The project focused primarily on the removal of invasive woody overstory and understory plant species while also targeting invasive vining species in problem areas. Work was completed using contract labor in conjunction with several young adult conservation crews. COVID-19 put a strain on many of the community engagement and outreach activities planned at the outset of this project, but the Bayou Preservation Association was able to successfully host two hybrid workshops to inform interested parties about the work happening in the park as well as about watersheds and habitat restoration as a whole.

Introduction

Much of the Houston-Galveston Region was historically part of the Gulf Coast Prairie ecosystem. The prairie was intersected by riparian forest lands adjacent to the region's many bayous and streams. These areas are sources of high biodiversity, providing food and shelter for a wide variety of plant and animal life. Challenger Seven Memorial Park still retains vestiges of the historic prairie ecosystem and also hosts ample amounts of riparian forest lands along Clear Creek.

Prior to the restoration work, most of the riparian habitat was densely populated by invasive species such as Chinese tallow (*Triadica sebifera*) and non-native privet (*Ligustrum sp.*). These species had grown to outcompete much of the native plants, resulting in exclusion zones, loss of diversity, and lack of native food sources for wildlife. Because these habitats no longer have the same natural biodiversity that existed prior to the invasion, the function of these systems is altered, leading to a reduced capacity to improve water quality, increased erosion, and an alteration of soil chemistry. Our work at Challenger Seven seeks to remedy some of the problems posed by invasive species and restore the natural functions and resilience of these riparian habitats.

When engaging in the removal of large invasive trees and the use of herbicides, it is important to educate and engage the public about the nature and purpose of the work. This helps to not only educate the public about the importance of habitat restoration, but often gains support from neighbors and park users for actions that to some may be construed as simply cutting down the trees they enjoy. To achieve this, we hosted two workshops to educate the public and park stewards about the work we were doing in the park as well as educate them on concepts including watersheds, habitat restoration, and invasive species.

Project Significance and Background

The Challenger Seven restoration project was important to restoring riparian habitat on the shores of Clear Creek. While densely populated with invasive species, the area was less degraded than many riparian areas in the region, and the presence of many native plants indicated that the recruitment of native species should be possible after the removal of competing invasives.

The riparian habitat has a direct effect on the water quality of Clear Creek. Functional riparian zones will slow the progress of water from the surrounding uplands into the creek and may help mitigate flooding. The reestablishment of the native understory will also help in soil retention and reduce erosion, as well as capture sediments and debris from runoff before it enters the channel. These healthy plant communities can also improve water quality through the utilization of nutrients, removing some from the water in order to facilitate plant growth.

Figure 2. Map of Challenger Seven Habitat Restoration work site.

The methods utilized here at Challenger Seven have been developed and honed over many years of experience, and we will continue to utilize these methods on future restoration projects. This restoration project helps to improve the riparian habitat in this region, promotes resilience of the habitat, and increases native habitat connectivity along Clear Creek. This project also provides recreational benefits to park

users by improving the visibility of Clear Creek, uncovering overgrown paths, and increasing wildlife diversity.

Figure 3: Workers clearing vegetation at the project site.

Methods

Habitat Restoration

Bayou Preservation Association secured contract labor through longtime partner, EBR Enterprises. EBR comes with decades of knowledge pertaining to plant identification and removal in Texas.

Bayou Preservation also hired work crews from the Student Conservation Association and Texas Conservation Corps (TxCC) to assist EBR in removing and treating invasive plants. Together, these work crews were able to improve 48.9 acres (Figure 6) of riparian habitat. Removals were completed with hand tools such as chainsaws, hand saws, pole saws, and loppers. Cut plants were then treated with appropriate, water-safe herbicides.

Figure 4. TxCC crew members.

Figure 5: Worker clearing brush at the project site.

Figure 6. Treated, large, multi-trunked Chinese tallow tree.

Figure 7. Large number of treated stumps.

Removals adhered to the following methodology which was detailed in a post-maintenance document and provided to county staff for the continued maintenance and success of the restoration project:

- Invasive plants were marked with paint by experienced practitioners to make identification of plants easy for those less experienced in plant identification.
- Marked plants were then cut, making sure that some of the stump, as well as the paint markings, were still visible for those following up with herbicide treatment.
- Leaf litter and cut debris were then removed from the base of the plant, and the plant was cut to expose as much of the cambium layer as possible.
- Herbicide was then sprayed carefully and directly onto the freshly exposed cambium layer.
- Mop-ups of previously treated areas were performed regularly to check for missed plants, plants that were not fully killed, and newly emerging seedlings.

Figure 8. Large felled ligustrum trees and treated stumps.

A small supplemental planting of 35 native wetland plants was conducted on March 2, 2022, in a visible drainage cleared of invasives. We hoped to improve species diversity and water quality while also improving aesthetics by choosing species with showy

blooms. Species planted include: 30 American crinum lilies (*Crinum americanum*), 3 blue flag irises (*Iris virginica*), and 2 purple pickerel weeds (*Ponterderia cordata*).

Figure 9. Native wetland plants planted in a restored tributary of Clear Creek.

Figure 10. Native wetland plants after planting.

Education and Outreach

The ongoing COVID-19 pandemic made many of our originally planned outreach activities difficult. Volunteer workdays and other community events were cancelled due to health concerns.

Bayou Preservation was fortunate enough to host two educational workshops to inform interested parties about the work being done at Challenger Seven as well as educate on the topics of watersheds, riparian corridors, habitat restoration, and invasive species.

Figure 11: Attendees from a project education and outreach program.

Our workshops were conducted using a hybrid model with an online, educational presentation followed the next day by an in-person visit to the worksite. Through our workshops, we reached at least 48 unique individuals from a wide variety of government, non-profit, and community groups including:

- American YouthWorks (Texas Conservation Corps)
- Clear Creek Watershed Partnership
- Ecosystem Planning & Restoration
- Interested Individuals
- Harris County Flood Control District
- Harris County Precinct 1
- Harris County Precinct 2

- Houston Arboretum and Nature Center
- Houston Parks Board
- Student Conservation Association
- Woolpert

Our second workshop, Watershed Restoration Workshop: Challenger Seven Memorial Park[1], was recorded and added to the Bayou Preservation Association's YouTube channel to for interested parties who were unable to attend.

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 5%, opening 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 EBR in the removal of large woody invasives, increasing the speed and efficiency with which we could combat many of these heavily-infested areas. The attendees of the workshops seemed interested and engaged with the information, and excited to see the work that has been completed at the park.

The Challenger Seven riparian restoration project resulted in the improvement of 48.9 acres of habitat, as well as the planting of 35 native wetland plants. We have already 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 emerging during this project include aquatic milkweed (*Asclepias perennis*), ironweed (*Vernonia sp.*), yellow passionflower (*Passiflora lutea*), and downy lobelia (*Lobelia puberula*).

[1] www.youtube.com/watch?v=2OkHAqlnrvw

Figure 12: Aquatic milkweed (Asclepias perennis) appearing after invasive clearing.

Discussion

Lessons Learned

Due to the removal of dense, invasive overstory, the increase light availability provides excellent growing conditions for both native and invasive species to grow. This can become a problem when many invasive seed sources are present both in the seed bank and in adjacent properties. We worked to reduce this threat by cutting and bagging the seeds off felled ligustrum trees when removals occurred during their fruiting season. This should help with maintaining this project's progress by reducing the number of invasive seeds in the work area. During this project, the importance of strong plant identification skills and frequent mop-ups were also highlighted by the late identification of exotic trees, including Chinese sweet plum (*Sageretia thea*) and Chinese elm (*Ulmus parvifolia*). This required working through areas that had already been treated to remove these trees which were unidentified previously.