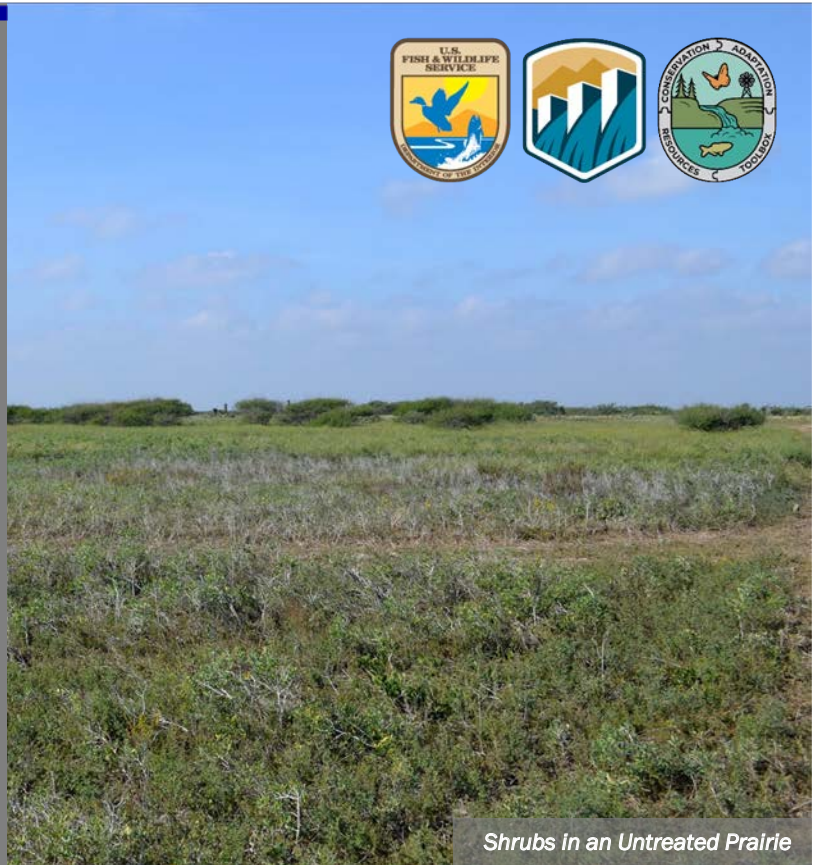


RESTORATION

Shrub Control to Restore a Coastal Prairie Ecosystem



The coastal prairie of Laguna Atascosa National Wildlife Refuge-Bahia Grande Unit in South Texas protects inland areas from storm surges and erosion and serves as habitat for the federally Endangered northern aplomado falcon (*Falco femoralis septentrionalis*). An increase in two native shrubs, honey mesquite (*Prosopis glandulosa*) and huisache (*Acacia farnesiana*), has reduced the cover of gulf cordgrass (*Spartina spartinae*). Gulf cordgrass is critical for northern aplomado falcon habitat in the Bahia Grande Unit. Researchers from the University of Texas at Brownsville partnered with The Peregrine Fund and U.S. Fish and Wildlife Service (USFWS) to evaluate treatments of woody plant cover.



Shrubs in an Untreated Prairie

KEY ISSUES ADDRESSED

Honey mesquite and huisache shrubs have decreased open prairie area. This decrease, paired with development and the use of DDT, has caused northern aplomado falcons to lose much of their habitat. These species block incoming sunlight and can reduce soil water content, restricting gulf cordgrass growth. Further, reduction of the grass' fibrous roots destabilizes the soil, increasing erosion potential. Several treatments are commonly used in grasslands, but managers were unsure what combination would work best in the Bahia Grande Unit. Management actions that restore coastal prairie while strategically conserving thornscrub ensure multiple species benefit, including the federally Endangered ocelot (*Leopardus pardalis*), which utilizes historic thornscrub habitat.

PROJECT GOALS

- Evaluate eight different combinations of shrub removal techniques to restore coastal prairie
- Remove 99.9% of shrubs in the coastal prairie of Bahia Grande
- Collaborate with other biologists to identify key management areas for both coastal prairie and thornscrub to support biodiversity

THE BIRDS ARE BACK

Following management efforts, northern aplomado falcons have returned to the habitat to hunt and breed.



Industrial Tractor Performing a Mechanical Treatment

PROJECT HIGHLIGHTS

Woody Plant Treatments: After twelve months, scientists measured shrub abundance, the fraction of dead shrubs left standing, and gulf cordgrass cover to generate a success index value for each combination of mechanical, chemical, and herbicide treatments.

Collaboration and Partnership: Scientists from the Peregrine Fund contributed historical knowledge and monitoring data of Bahia Grande's northern aplomado falcon population and provided the herbicide, a mixture of 20% Remedy Ultra and 80% basal bark oil, that was applied during certain treatment regimes. The fire program at Laguna Atascosa National Wildlife Refuge has been integral to the prairie restoration efforts. They incorporate biologists' management needs when conducting prescribed burns to achieve desired results.

Spatial Planning: Biologists and managers meet periodically to determine key management areas for thornscrub and prairie areas. They use soil data and GIS software to create maps depicting historical boundaries between prairie and thornscrub. These maps help identify areas where prairie restoration would be most successful while ensuring historic thornscrub habitats will be preserved.

Collaborators

- The University of Texas at Brownsville
- U.S. Fish and Wildlife Service
- The Peregrine Fund

CART Author: Jack Carter, University of Oklahoma, September 2023.
Photos courtesy of USFWS
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LESSONS LEARNED

The most effective strategy was the most expensive and utilized a mechanical treatment, herbicide application, and prescribed fire. Prescribed fire alone was the cheapest option, but was the least effective. Fire does not immediately remove standing shrub structures, and large shrubs are more likely to survive prescribed fire treatments. While fire alone fails to promote rapid gulf cordgrass recovery, it has several benefits when combined with other treatment types. Following a mechanical treatment, prescribed fire cleared debris from the soil and increased recovery rates for gulf cordgrass. However, following a mechanical treatment, prescribed fire was useful for clearing debris from the soil, and strategies that incorporated fire promoted increased recovery rates for gulf cordgrass.

Instead of applying herbicide immediately, managers should wait to observe which shrubs resprout. This waiting period allows more effective and efficient application of follow-up chemical treatments by targeting shrubs that are visibly resprouting. Researchers recommend annual herbicide applications for at least two years after mechanical and prescribed fire treatments.

NEXT STEPS

- Create photo monitoring stations at treated sites
- Conduct follow-up herbicide applications as needed and implement a prescribed fire regime, preferably every 3-5 years
- Coordinate with the refuge's fire program to determine the best prescribed fire strategy

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A Prescribed Fire Treatment