

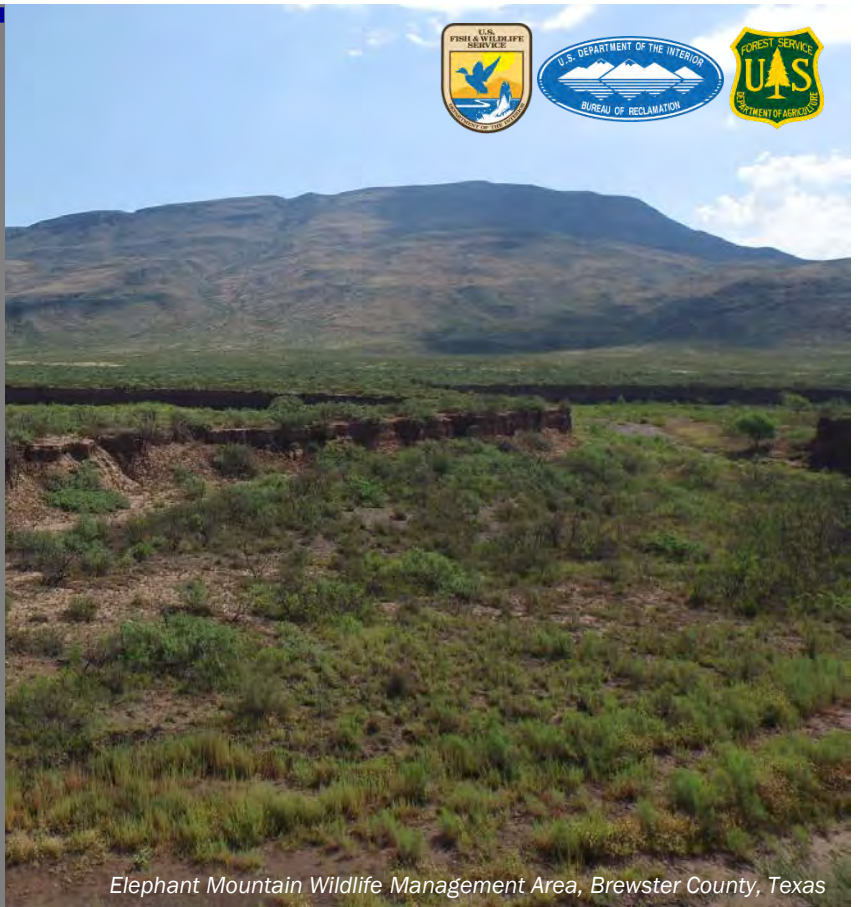
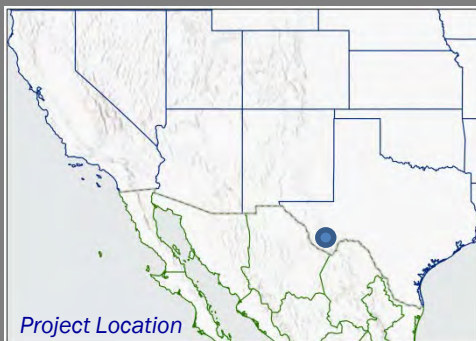
RESTORATION

Herbicide Treatment of Western Honey Mesquite in Texas Grasslands

BORDERLANDS
RESEARCH ♦ INSTITUTE

CONSERVING THE LAST FRONTIER

Woody plant encroachment is an increase in tree, shrub, and cactus abundance in former grasslands. This change is primarily attributed to overgrazing, fire suppression, and various mechanisms of seed distribution. The Trans-Pecos region of Texas is affected by encroachment of native shrub species including creosote, juniper, cacti, and mesquite. Between 2015 and 2016, researchers with Texas Parks and Wildlife Department (TPWD) and the Borderlands Research Institute (BRI) at Sul Ross State University evaluated the effectiveness of Sendero herbicide in removing western honey mesquite from the southwestern regions of Elephant Mountain Wildlife Management Area (EMWMA).



Elephant Mountain Wildlife Management Area, Brewster County, Texas

KEY ISSUES ADDRESSED

Historical overgrazing, suppressed fire, soil disturbance, seed distribution by livestock, and climate change have driven the expansion of woody species into southwestern grasslands over the past 150 years. Increased tree and shrub cover changes impacts both human land use and wildlife by increasing the erodibility of the soils, altering hydrology, reducing infiltration, and decreasing foraging species for wildlife. The future of semi-arid grasslands is unclear but evidence suggests that without active intervention, the density of woody plants will continue to increase. The increase of woody plants out-compete native grasses, reducing forage for grassland species, altering hydrology controlled by ground cover plants, and altering soil nutrient cycles.

PROJECT GOALS

- Determine if Sendero herbicide or a Sendero/Remedy mix is more effective for control of honey mesquite
- Compare the effectiveness of Individual Plant Treatment (IPT) and aerial application
- Develop a treatment plan for honey mesquite
- Restore grassland habitat

INVASION OF GRASSLANDS

Historical overgrazing and fire suppression have degraded grassland soils and vegetation. Woody plant encroachment has converted many North American grasslands into shrublands.



BRI Researchers Administer Individual Plant Treatments

PROJECT HIGHLIGHTS

Aerial Application: In July 2015, 418 acres were treated using sprayers from a fixed-wing aircraft at a rate of 4 gallons per acre. Mesquite populations were surveyed pre-herbicide treatment and biannually post-treatment. Herbicides (concentration by total volume of 5.4% Sendero/5.4% Sendero + 1.5% Remedy Ultra) were mixed with water, a surfactant (RRIS), and an anti-drifting agent (Elite Velocity).

Individual Plant Treatment (IPT) Application: In August 2015, over 90 acres were treated with IPT treatments by backpack sprayers or ATV sprayers with 19 gallons of Sendero and 2 gallons of Remedy Ultra, at a rate of roughly 0.23 gallons per acre. Herbicides (1% Sendero/1% Sendero + 0.25% Remedy Ultra) were mixed with water, RRIS, and Elite Velocity.

Control Plots: An additional 94 acres were reserved as control plots to be compared to treated plots.

Waiting for Ideal Conditions: Above-average rainfall came early in the season, postponing application of treatments by a couple of weeks due to lower-than-ideal soil temperatures and early bean elongation.

Collaborators

- Texas Parks and Wildlife Department
- Borderlands Research Institute, Sul Ross State University

Funding Partners

- Texas Parks and Wildlife Department
- The Quail Coalition
- Park Cities Quail Coalition
- Dow Agrosiences

Lead Author: Philip Boyd, Sul Ross State University, Sept. 2019. Case study support provided by US Fish and Wildlife Service, US Bureau of Reclamation, and US Forest Service. Photos courtesy of BRI, Sul Ross State University

LESSONS LEARNED

Western honey mesquite mortality was highest in the aerial and IPT areas where the Sendero/Remedy herbicide mix was used, ranging from 55-70% in aerially treated areas and 45-60% in IPT areas.

Grass cover increased across treatment sites post treatment from an estimated 7% cover to 31% one year following herbicide treatments. This included an increase in abundance of grass species present before treatment, and additional annual grass species not present before treatments. Forb cover decreased in treatment areas from 19% to 11%. Forb cover increased in control plots from 23% to 28%.

The straight Sendero herbicide and Sendero/Remedy herbicide mix reduced canopy cover for many brushy plant species such as catclaw, lotebush, tasajillo, and tarbush, but not as extensively as treatments reduced canopy cover for the targeted mesquite.

NEXT STEPS

- Continue monitoring post-treatment use of plots by wildlife
- Use results of this study to inform herbicide treatment of honey mesquite
- Determine if aerial or IPT herbicide application is more cost-effective
- Open the treatment plots as demonstration for university students and landowners who are researching management techniques

PROJECT RESOURCES

For more information on this project, contact Dr. Ryan Luna: rluna@sulross.edu

For additional project resources and case studies, visit the Collaborative Conservation and Adaptation Strategy Toolbox: WWW.DESERTLCC.ORG/RESOURCE/CCAST



Stands of Treated Brush 1 Year Post-Treatment