

RESTORATION

Treatment of Non-Native Lovegrasses at Appleton-Whittell Research Ranch

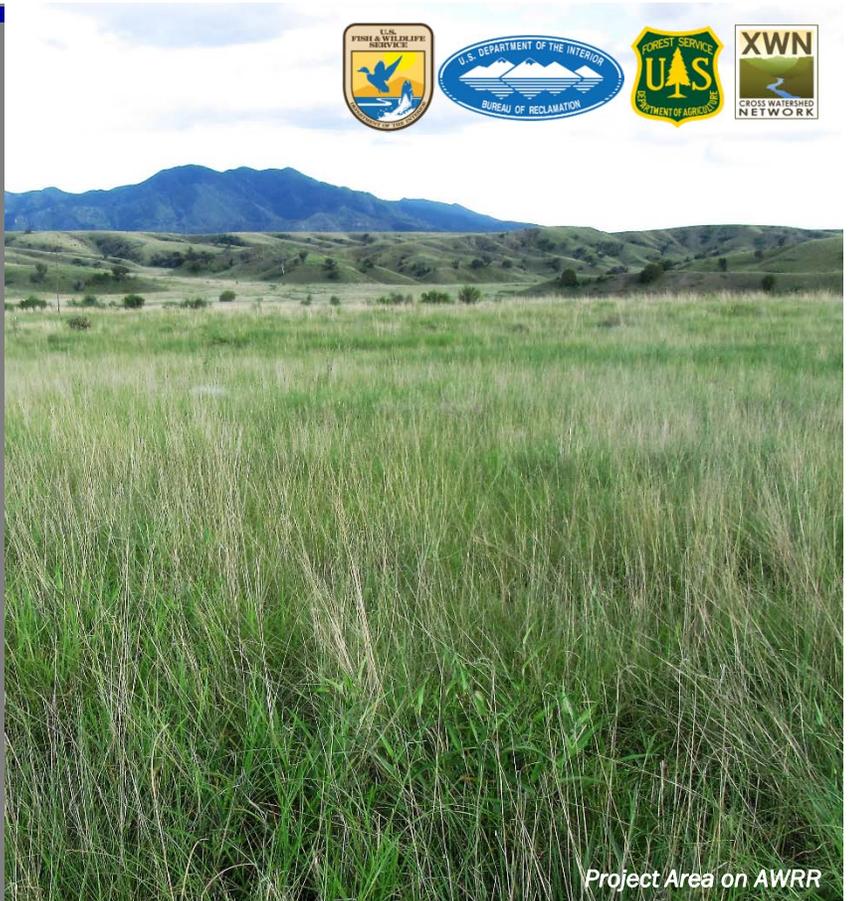


The 8,000-acre Appleton-Whittell Research Ranch (AWRR) is located in the semi-arid grasslands within the Sky Islands of southeastern Arizona. Since 1968, when the Appleton family converted their cattle operation into an ecological research station and sanctuary for native biota, the research ranch has protected Southwestern ecosystems through conservation, research, and education.

National Audubon Society manages AWRR in partnership with the U.S. Forest Service, Bureau of Land Management, The Nature Conservancy, Swift Current Land & Cattle Co., and The Research Ranch Foundation.



Project Location



Project Area on AWRR

KEY ISSUES ADDRESSED

Boer and Lehmann lovegrasses (*Eragrostis curvula* and *E. lehmanianna*) were introduced to increase grass cover and livestock forage in the mid-1900s. These South African species provide lower quality forage, and areas dominated by these species support fewer native plants and animals than native grasslands with high species richness. Although native vegetation predominates on most of AWRR, the rapid spread of these non-native species threatens the Ranch's mission. Lehmann lovegrass can become the dominant species in a previously healthy native grassland in as little as six years. Boer lovegrass does not spread as rapidly, but once established is more effective than Lehmann in excluding native species. AWRR staff began experimenting with treatments of lovegrass in the late-1990s to identify effective methods to protect and rehabilitate native grasslands.

PROJECT GOALS

- Protect native habitat to serve as a reference site for research and as a source of native, site-adapted seed for rehabilitation efforts
- Develop treatments to control the spread of non-native, invasive grasses
- Share treatment methodology and results with other land managers

VISIBLE RESULTS

“When a neighboring rancher asks ‘How did you do that?’ you must be doing something right.” -Linda Kennedy AWRR Director (retired)



Treating Non-Native Grasses with IPT

PROJECT HIGHLIGHTS

Finding a Method: Control efforts included fire, mowing, chemical, physical removal, alteration of the carbon-nitrogen ratio, and grazing by domestic livestock. Of these, only chemical treatment (glyphosate at manufacturer-recommended concentrations + colorant + surfactant) has been effective.

Successful Treatments: In two years, the frequency of Lehmann lovegrass in monitoring plots (40 cm by 40 cm quadrats along pace transects) was reduced from 70% to 10%. Both target species respond to chemical treatment, but repeated treatment throughout the growing season and a commitment to long-term treatment is necessary for sustained success.

Native Plants Respond: Active rehabilitation of native vegetation has not yet been necessary in places where native species are present at 30-60% frequency and avoided during chemical treatment. Careful adherence to Individual Plant Treatment (IPT) ensures there is no collateral damage to desired plants, which undergo competitive release when the frequency of non-natives is reduced.

Collaborators

- Arizona Department of Forestry and Fire Management
- USDA FS Regional Pesticide Specialist
- USDA-NRCS Plant Materials Center

Funding Partners

- Arizona Department of Forestry and Fire Management

Case study support provided by US Fish and Wildlife Service, US Bureau of Reclamation, US Forest Service, and Cross Watershed Network. Updated August 2018. Photos courtesy of Linda Kennedy/Audubon

LESSONS LEARNED

Long-term success of treatments requires continuous management efforts. Non-natives will quickly reclaim a site if the land-manager does not regularly monitor and re-treat as necessary. The seed bank of both target species is persistent for several years, and new seed is introduced from untreated areas via wind and roads.

Repeat chemical treatment of the treatment areas is necessary throughout each growing season as Lehmann lovegrass can germinate and produce seed very rapidly.

Treatment schedules must be adjusted according to weather and precipitation patterns. In spring, Lehmann lovegrass is susceptible to chemical treatment only if there is sufficient soil moisture to facilitate green-up. Prime treatment time is during monsoon, when plants are susceptible to chemical treatment and easily identified.

Areas with low occurrence of non-native grasses can be maintained relatively inexpensively with IPT compared to areas where non-natives are dominant.

NEXT STEPS

- Expand treatment into an area where Lehmann lovegrass dominance reaches 90% frequency
- Use long-term monitoring to show efficacy of treatments
- Re-treat Lehmann lovegrass as needed

PROJECT RESOURCES

For more information on this project, contact Christina Francois: cfrancois@Audubon.org

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



Native Forbs and Grasses Respond after Treatment