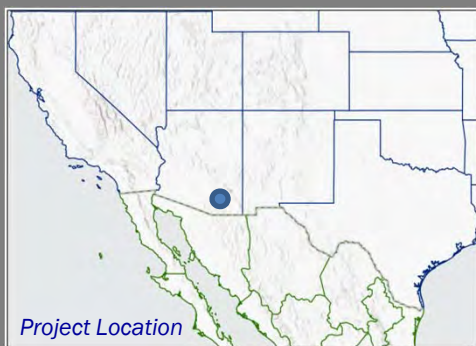


RESTORATION

Brush Treatment for Grassland Restoration as Part of an Adaptive Management Framework in the Cienega Creek Watershed



The Las Cienegas National Conservation Area (LCNCA), managed by the Bureau of Land Management (BLM) and located about 50 miles (80 km) southeast of Tucson, is well-known for its exceptional biological value, including five of the rarest community types in the American Southwest. Since 2007, the BLM has been combating shrub species encroachment at LCNCA with the goal of treating about 21,000 acres. The BLM has partnered with The Nature Conservancy (TNC) to evaluate the effectiveness of a suite of brush treatment techniques through rigorous monitoring.



Mechanical Brush Treatments/JJ Swift

KEY ISSUES ADDRESSED

In western North America, woody species encroachment on grasslands is driven by historic overgrazing and fire suppression. As a result, accelerated erosion and loss of perennial grass cover has led to reduced forage for livestock and diminished habitat for grassland-dependent wildlife species. A native woody species, velvet mesquite (*Prosopis velutina*), now dominates vast areas that were once semi-desert grasslands at LCNCA. Many regional land managers are engaged in brush treatment techniques to control mesquite and other woody species; however, the effects of most treatment efforts have been poorly documented. There is a strong need to determine effective and ineffective brush treatment techniques in the context of an adaptive management program.

PROJECT GOALS

- Reduce velvet mesquite cover to maintain semi-desert grasslands for wildlife, livestock, and decrease erosion
- Employ pre- and post-treatment monitoring to assess treatment effectiveness and impacts
- Incorporate results into adaptive management strategy

ADAPTIVE MANAGEMENT

Monitoring results are being used to inform future treatment planning, providing the basis to modify current management strategies.



Prescribed Fire Treatments/Dan Quintana

PROJECT HIGHLIGHTS

Site Selection: The treatment area was strategically chosen because it connects grasslands in good condition and contains few obstacles to heavy equipment. The area also has a high concentration of sites with high visitor use, designated recreation, and protected historic sites.

Brush Treatments: Six treatment combinations have been implemented on over 15,000 acres to control woody species: fire, mechanical grubbing, mastication with stump herbicide spray, cut and stump herbicide spray, foliar herbicide spray, and mastication with herbicide treatment followed by prescribed fire.

Pre and Post-Treatment Monitoring: To quantify the effects on mesquite and track grassland response across treatment areas, TNC and BLM staff established permanently marked 50-meter transects at stratified, random locations. Detailed monitoring protocols are included in the final report (see online resources).

Treatment Cost Comparison: The analysis of treatments included a cost comparison which calculated cost per acre of each treatment method.

Collaborators and Funding Partners

- See online for full list of collaborators and funding partners

Case study support provided by the US Fish and Wildlife Service, US Bureau of Reclamation, US Forest Service, and Cross Watershed Network. Updated August 2018. Photos courtesy of Bureau of Land Management

LESSONS LEARNED

Mechanical grubbing and cut + spray had the most pronounced effects in reducing mesquite cover. Mechanical grubbing resulted in up to 91% mesquite mortality and cut + spray was up to 81%. All treatments generally resulted in increased perennial ground cover and reduced bare ground the first or second year after treatment.

The effects of burning on mesquite cover were not consistent between plots. As these sites are re-burned, further effects of fire on woody species cover may be realized.

The least expensive treatment, prescribed fire, provided the smallest reduction in woody plant cover, at least with one burn. Cut + spray was the most expensive treatment, but was effective in providing immediate reductions in plant cover. Mechanical grubbing, intermediate in cost and best at effectively reducing mesquite cover, provides the best all-around cost effectiveness.

Retreatment strategies should be an integral part of any treatment plan.

NEXT STEPS

- Implement a maintenance program to keep treated areas from becoming re-infested with mesquite
- Continue to plan and implement grassland restoration treatments

PROJECT RESOURCES

For more information on this project, contact Dan Quintana: dquintan@blm.gov

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



Treated (left) and Untreated (right) Areas/JJ Swift