RESTORATION

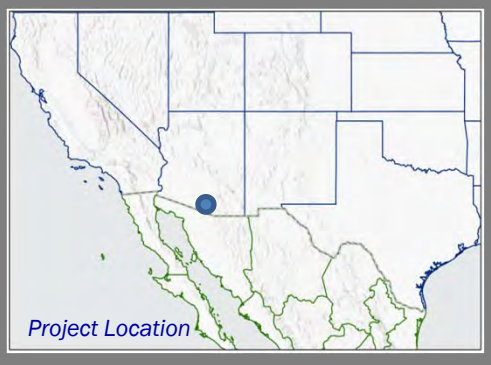
Over 30 Years of Brush Management on the Elkhorn Ranch

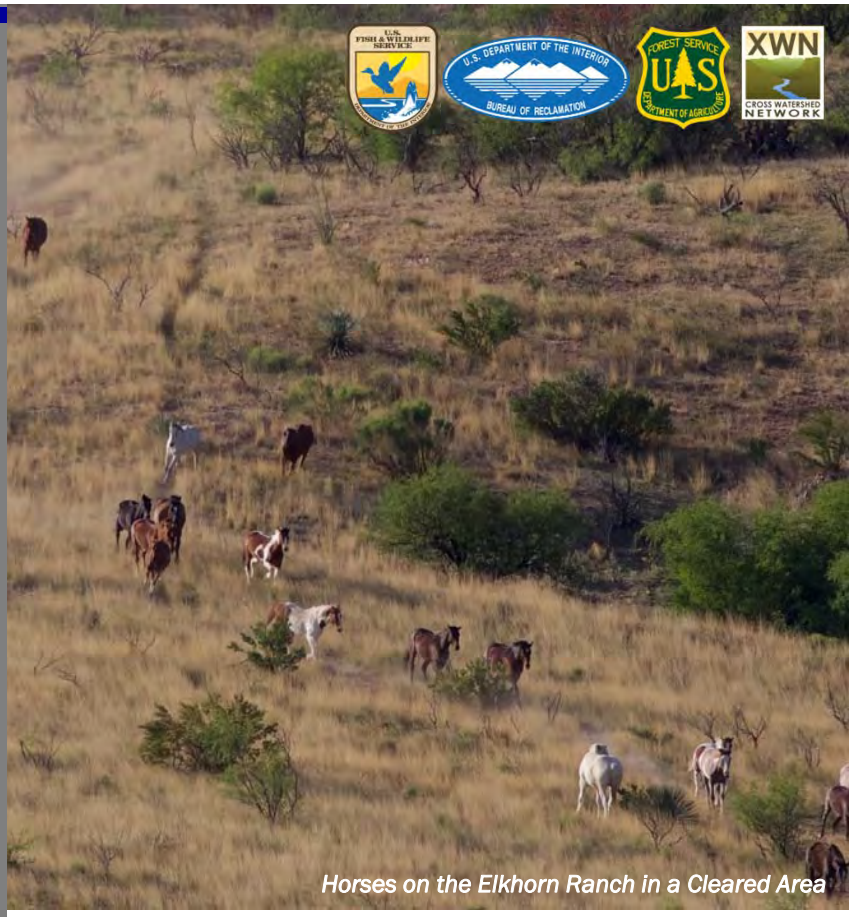
EST. 1945 TUCSON, ARIZONA

ELKHORN RANCH

OWNED AND OPERATED BY MILLER FAMILY

Elkhorn Ranch (the Ranch) sits on approximately 10,000 acres in the Altar Valley of southern Arizona. The Ranch was purchased by the Miller family in 1945 as a guest ranch and cattle operation. In response to severe drought in the 1970s, the family removed cattle and focused on using the property to breed saddle horses and run a guest ranch. The ranch owners practice conservation-minded land management, and work with the US Natural Resource Conservation Service to scientifically monitor range vegetation and conduct stewardship projects. They have been engaged in a long term brush management project since 1984.





Horses on the Elkhorn Ranch in a Cleared Area

KEY ISSUES ADDRESSED

Woody species encroachment is occurring in arid and semi-arid regions worldwide. In western North America, extensive replacement of grasslands by mesquite trees (*Prosopis* spp.) is driven by numerous interacting factors including historical overgrazing, fire suppression, and climate change. The conversion of grasslands to shrublands can lead to decreased rangeland productivity and loss of grassland-dependent wildlife. Brush management is the practice of removing or reducing undesirable trees or shrubs, often with the goal of promoting herbaceous cover. Prior to implementing brush management, mesquite cover in the treatment area at Elkhorn Ranch was over 50% with severe gully erosion and minimal understory vegetation.

PROJECT GOALS

- Reduce woody vegetation cover to increase productivity of herbaceous species
- Slow the flow of water in gullies to minimize erosion and keep water on the landscape

BRUSH HAS VALUE TOO

Belts of woody vegetation left along drainages provide corridors to support wildlife movement.

Overview of Cleared Areas with Brush Left in Drainages

PROJECT HIGHLIGHTS

Long-Term Treatments: Brush management treatments were implemented on 1,000 acres starting with mechanical removal of woody vegetation between 1984 and 1990. Follow-up treatments with herbicide backpack sprayers have occurred since 2002. They have used Tordon since 2002 and started using Remedy in 2004 as a follow-up treatment. Maintenance includes annual spot treatment of resprouts and seedlings using herbicide backpack sprayers.

Beneficial Use of Brush Piles: Cleared trees were pushed into incised gullies to slow down water and help reduce erosion.

Aerial Imagery Analysis: To assess treatment effectiveness and monitor changes in woody species cover over time, the ranch owners collaborated with AVCA and a GIS contractor to analyze aerial imagery beginning with pre-treatment conditions of 1974.

Monitoring to Inform Management: The ranch owners have conducted annual rangeland monitoring with NRCS since 1983. Additionally, simply observing their land over time has afforded the ranch owners an intimate understanding of the landscape's response to variable climate patterns and management practices.

Collaborators and Funding Partners

- Altar Valley Conservation Alliance, USDA Natural Resource Conservation Service, Robinett Rangeland Resources, Quiet Creek Corporation, Arizona Game and Fish Department

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 Elkhorn Ranch

LESSONS LEARNED

Though the work took place on just 10% of the Ranch, it has had a noticeable impact on rangeland condition on the remaining acreage--the increase in productivity on treated areas has allowed for greater pasture rotation flexibility, and untreated areas have seen a recovery of native grass species.

Aerial imagery analysis shows that woody vegetation cover has declined each year since treatment began. Imagery from 2017 suggests an increase in woody cover from 1% to 5%. This may be due to growing resprouts becoming visible, combined with an increase in pixel resolution resulting from advancements in remote sensing capabilities.

The ranch owners have observed a reverse in gully erosion trends in treated and untreated areas. This is likely due to a combination of increased perennial grass cover following brush removal, and the practice of piling brush in gullies.

The treated areas are more amenable to the guest ranch operations. These areas are more scenic, more open, and easier to traverse on horseback.

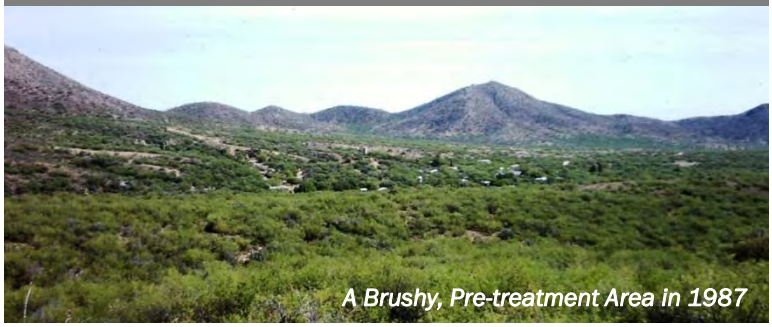
NEXT STEPS

- Work with the Altar Valley Conservation Alliance partners to explore the use of prescribed fire and aerial herbicide applications
- Examine seeding strategies to increase native grass establishment

PROJECT RESOURCES

For more information on this project, contact Mary Miller: mary@altarvalleyconservation.org

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



A Brushy, Pre-treatment Area in 1987