



A Message from the Director South

Grassland Resilience Workshop Series: Brush Management & Soil Health

Soil degradation and velvet mesquite grassland encroachment are two of the most pressing challenges facing southern Arizona grasslands. Brush management conservation practices are employed across southeastern Arizona, but the effects and outcomes can vary widely. This workshop series, a collaborative effort by US Fish and Wildlife Service Conservation Adaptation Resources Toolbox/USFWS CART, UArizona Cooperative Extension and many others, gathered land managers, ranchers, and researchers to learn about the variety of brush management practices on velvet mesquite as related to soil health used in three adjacent watersheds. The series sought to improve the collective understanding of why the outcomes of management practices differ largely based on soil characteristics like texture, but also gain insights into the potential results of brush management on velvet mesquite in the future. Overall, participants received field-based examples of these management practices and how they relate to various natural resource conditions including soil, vegetation, and wildlife habitat.

The workshop series started with a virtual kickoff event on October 10th, 2023, followed by three in-person field visits at the Santa Rita Experimental Range (Oct 20th), the Altar Valley (Nov 3rd), and the Bureau of Land Management-managed Las Cienegas National Conservation Area (Jan 19th, 2024). Each workshop was hosted with local partners and featured experts who spoke to the ecological features of the landscape, treatment planning and implementation, and effects of management on soil health, vegetation, and wildlife habitat quality. Below is a brief recap of each of these events:

Virtual Kick-Off

To orient the future field day attendees and members of CART's Grassland Community of Practice to this series, a general introduction related to velvet mesquite encroachment and brush management in the three watersheds was provided. Brett Blum, UArizona Director for the Southern Arizona Experiment Station, discussed the long research and land management history on the Santa Rita Experimental Range. Next, Julia Guglielmo from the Altar Valley Conservation Alliance provided context for their collaborative efforts across multiple landowners related to brush management for wildlife habitat, grassland conservation, and their science-based approaches to assessing management results. Lastly, Scott Jones from UArizona, shared his recent research surrounding shrub encroachment dynamics and its effect on ecosystem services at the Las Cienegas National Conservation Area (NCA). The virtual event ended with a lively Q&A from participants which helped guide interest and topic areas for the future field days.

Santa Rita Experimental Range

This workshop was largely focused on the history of and ongoing research surrounding velvet mesquite encroachment conducted at the SRER, where the day began with an orientation to the Range by Brett Blum. The day included field presentations and discussion from researchers, Austin Rutherford (USDA-ARS), Rachel Gallery (UArizona), Mary Nichols (USDA-ARS), and Heather Throop (ASU) across a variety of topics like shrub establishment, plant and soil nutrient dynamics, and risk of soil erosion as related to grassland-shrubland transitions. Participants got hands-on experience texturing surface soils and a crash course in how soil texture plays a vital role in determining landscape soil conditions provided by Samantha Carrillo from the NRCS-Soil and Plant Science Division. We wrapped up the day hearing about upcoming potential brush management activities on the Range from the AZ Department of Forestry and Fire Management's Johnathan Pelak. It ended up being a rather hot day in late October, but participants stuck it out with us and provided great feedback to improve the next workshops in the series.

group’s objectives for the day. We discussed the Valley’s past herbicide, mechanical, and fire treatments, including their goals and results, with land managers Charlie and Mary Miller of the Elkhorn Ranch as well as Walter Lane from the Santa Margarita Ranch. After lunch, we toured the USFWS Buenos Aires National Wildlife Refuge with Shawn Sullivan and Reese Crebbin for an extensive discussion on the role of fire in maintaining grasslands, and how recovery following fire can be tied to existing soil characteristics. We wrapped up the day by touring a recent high severity burn with fruitful discussion about a land’s potential for recovery following a burn.

Las Cienegas National Conservation Area

In the final workshop of the series, we heard from the Bureau of Land Management including Joan Breiner (Las Cienegas manager) and Dan Quintana, who leads the brush management efforts. Scott Jones and Austin Rutherford provided a brief overview on the ecology of velvet mesquite at the Las Cienegas, plus the ecosystem trade-offs surrounding brush management. This field day highlighted wildlife conservation efforts surrounding prairie dogs from Jennifer Presler (AZ Game and Fish), specialized bird habitat with Steven Prager (Audubon’s Appleton-Whittell Research Ranch), and the efforts concerning Sonoran pronghorn antelope conservation from John Millican (AZ Antelope Foundation). Samantha Carrillo emphasized the soil characteristics at each stop, including a texture jar test to visualize the ratio of sand, silt, and clay at the end of the day. The series concluded with a lively Q&A, which is tentatively planned to continue in a follow up virtual event to recap the series and the complex considerations involved surrounding brush management treatments and soil health.

This workshop series would not have been possible without all our great sponsors:



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Bureau of Land Management-managed Las Cienegas National Conservation Area.

Donate a Steer to Help Rangeland Students!

The University of Arizona student chapter of the Society for Range Management, [Tierra Seca](#), is looking for a producer to partner with. Each year, Tierra Seca raffles a processed steer as their largest fundraiser, and they are looking for a partner willing to donate a steer.

If you would like to partner with the UA student Chapter, please reach out to Doan Goolsby, the Public Affairs and Outreach Officer for the club at uofatierraseca@gmail.com

Interested in rangeland and arid lands research? Consider attending the Research Insights in Semi-arid ecosystems (RISE) Symposium on the University of Arizona Campus! The symposium will feature research happening on the Santa Rita Experimental Range and Walnut Gulch Experimental Watershed. Visit the website to learn more and register!

<https://www.tucson.ars.ag.gov/rise/v2/index.html>

Contribute to Student Research on Cattle Movement in response to Temperature!

A better understanding of temperature impacts of spatial distribution could help ranchers better predict their cattle's behavior in response to weather, help predict areas of environmental stress, as well as improve breeding strategies in the future as spatial data becomes more utilized in genetic selection. The student hopes to use 15-20 GPS collars to collect geospatial data on cattle which should update every few minutes. They will also plan to collect site-level temperature data using sensors to get temperature points for every few minutes. The student is seeking connections with ranchers who would be willing to partner for this project

If you are interested, please reach out to [Elise Gornish](#)



An excellent video from the Western Landowners Alliance about leveraging grazing to improve lands under climate change!

Research linking forage and animal movement

[StockSmart](#), a free web application developed through a recent USDA NIFA grant by a project team of Washington State University Extension, University of Arizona Communications and Cyber Technologies, and the U.S. Forest Service, allows users to access accurate, spatially-explicit forage production data and combine it with spatially-explicit terrain use by livestock to develop sustainable starting stocking rates that are responsive to interannual variation in herbaceous above-ground biomass and are based on calculations of forage in the areas actually accessed by grazing animals.

Header Photo Credit: Scott Jones, UArizona

Herd of pronghorn antelope at the Las Cienegas National Conservation Area, where brush management is actively used to conserve pronghorn grassland habitat.

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