

2023

*Society for Range  
Management  
Annual Meeting*



Society for Range Management



**RANGELANDS**

**Without Borders ★ SRM 2023**

February 12-16, 2023 | Boise, Idaho

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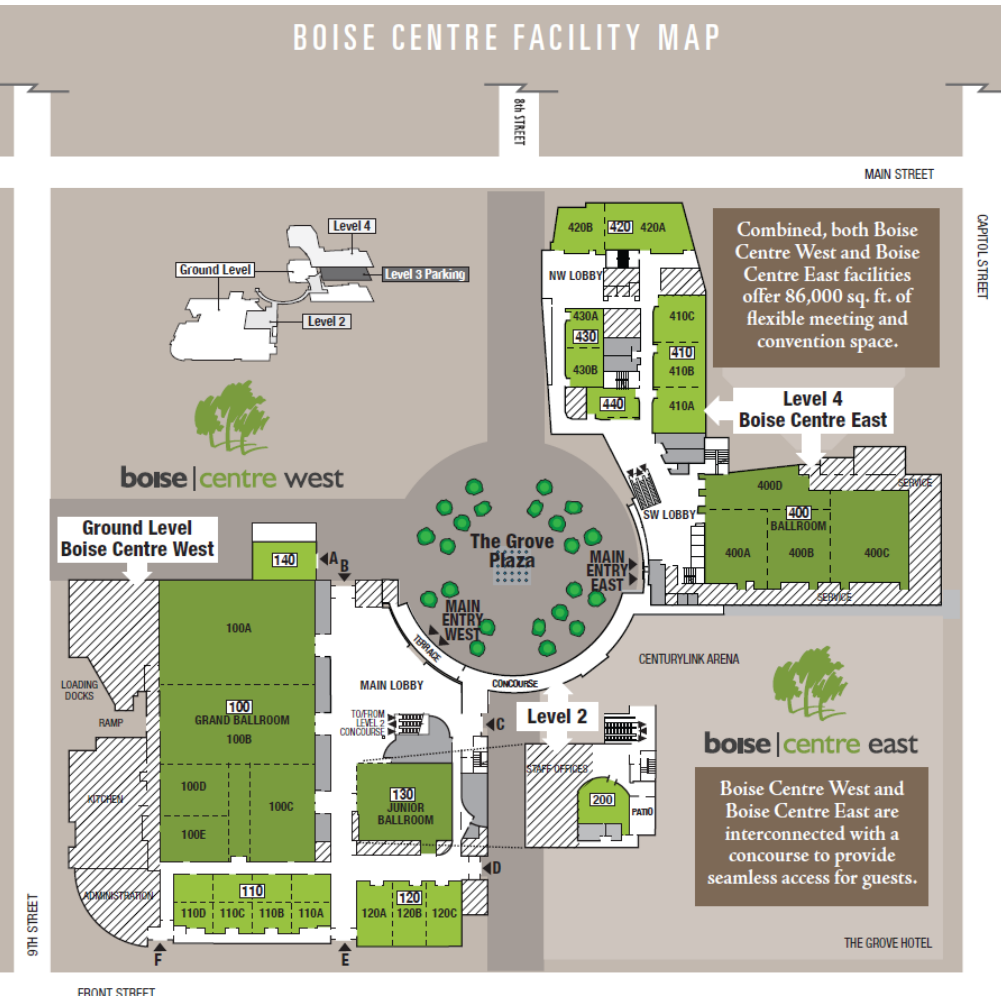
## REGISTRATION HOURS

SUNDAY.....	8AM-8PM
MONDAY.....	7AM-7PM
TUESDAY.....	7AM-7PM
WEDNESDAY.....	7AM-NOON

[WWW.RANGELANDS.ORG/ANNUAL-MEETING-2023](http://WWW.RANGELANDS.ORG/ANNUAL-MEETING-2023)

## FACILITY MAP

### BOISE CENTRE FACILITY MAP



Society for Range Management



**RANGELANDS**  
Without Borders ★ SRM 2023

February 12-16, 2023 | Boise, Idaho

## WELCOME TO THE 2023 SRM ANNUAL MEETING!

On behalf of the 2023 Planning Committee we welcome you to Boise and what is sure to be an outstanding conference! This year's theme, Rangelands Without Borders, is a true representation of the collaboration and work put in by this year's Host Sections, the Idaho and International Mountain Sections. This year's program offers something for everyone as the response for submitted sessions, abstracts, and posters was truly phenomenal—we thank everyone who took the time to be a part of this year's meeting. This year's meeting format builds on what we have learned over the past two years in terms of meeting structure and online capabilities. While this year's conference is completely in-person, we will be live-streaming and recording all of the technical sessions to be available to our virtual audience. For those in-person, there is no way to take part in every session being offered, so be sure to log-on to the virtual meeting site after the conference has ended to stream those sessions you might have missed.

We look forward to another great meeting amongst our SRM members, colleagues and friends.

*- SRM Annual Meeting Planning Committee*

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# THANK YOU TO THE 2023 ANNUAL MEETING

*Presenting Sponsors!*

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**United States  
Department of  
Agriculture**

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**Natural Resources Conservation Service**



## THE SRM PRESIDENT WELCOMES YOU

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I want to welcome you to learn and experience the 2023 Annual Meeting of the Society for Range Management. We will celebrate our 75 years as a professional society in my home state of Idaho. Enjoy a few clear, cold and captivating February days with me.

"Rangelands Without Borders" is the theme for this year's meeting which prompts us to consider how rangeland stretch across the globe, across disciplines, and across eras. Workshops and symposia will reveal how rangeland resources and ecological forces including fire, herbivory, weed invasion, wildlife, hydrology, and climate pay little attention to land tenure or government borders. We will find innovative management strategies and new scientific insight by reaching across disciplines. We will even reach across cyberspace with an in-person meeting in Boise and a virtual meeting for rangeland enthusiasts across the globe.

An international emphasis will be highlighted in presentations and discussions. The Canadian and American SRM members who developed this meeting enjoyed reaching across borders and sharing our love of rangelands. Our meeting's theme is fitting as our international society joins with people and organizations from across the globe to kick off the journey to the International Year of Rangelands and Pastoralists (IYRP) which will be celebrated in 2026.

A diverse group of people and strong partnerships are needed to make wise decisions and effectively accomplish land management. At this meeting I hope you will reach across borders to meet ranchers and landowners with knowledge of rangelands gained through generations of managing and living on working landscapes. You can learn from scientists who bring new understanding to the social and ecological principles that drive change on rangelands. You can also exchange ideas with rangeland professionals who are familiar with a diversity of management approaches. Also shake the hands of a few students and young professionals who will study and manage rangelands well into the future.

*See you in Boise or Online!*

Steady On,

A handwritten signature in blue ink that reads "Karen".

Karen Launchbaugh  
President | Society for Range Management

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## SRM OFFICERS

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**President | Karen Launchbaugh**

Professor of Rangeland Ecology, University of Idaho, Moscow, ID

**1st Vice President | Dr. Barry Perryman**

Professor of Rangeland Ecology & Management University of Nevada-Reno

**2nd Vice President | Karen R. Hickman**

Professor and Director, Environmental Science Program  
Director of Undergraduate Research, Honors, and Academic Assessment  
Ferguson College of Agriculture Oklahoma State University

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## BOARD OF DIRECTORS

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**Susan Edlinger Marshall**

Professor Rangeland Resources and Wildland Soils Humboldt State University

**John Walker**

Professor & Center Director  
Texas A&M AgriLife Research

**Delane Atcitty**

Indian Nations Conservation Alliance, Executive Director

**Tip Hudson**

Rangeland & livestock management specialist  
Washington State University Extension, Professor

**Dr. John A. Taylor**

Chair, North Australian Beef Research Council Brisbane, Qld Australia

**Dr. Leslie Roche**

Associate Professor of Cooperative Extension  
University of California, Davis



Natural Resources Conservation Service



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- Rangeland management specialists
- Soil scientists
- Biologists
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February 15-27, 2023. For more information on eligibility, requirements, and job seeker tips, scan the QR code or visit

[FS.USDA.GOV/JOBS](https://FS.USDA.GOV/JOBS).



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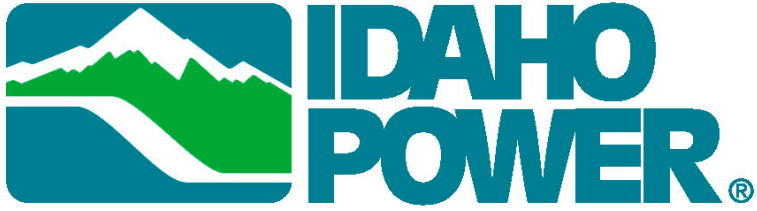
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## SCHEDULE AT A GLANCE

### MONDAY, FEBRUARY 13TH

8am-9:30am.....	Plenary
9:30am-10am.....	Coffee Break in the Trade Show
10am-11:30am.....	Technical Sessions
11:30am-1pm.....	Lunch
1pm-3pm.....	Technical Sessions
3pm.....	Coffee Break in the Trade Show
3pm-5pm.....	Technical Sessions
5pm-6:30pm.....	Poster Session

### TUESDAY, FEBRUARY 14TH

8am-9am.....	Plenary
9am-9:30am.....	Coffee Break in the Trade Show
9:30am-11:30am.....	Technical Sessions
11:30am-1pm.....	Lunch
1pm-3pm.....	Technical Sessions
3pm.....	Coffee Break in the Tradeshow
3pm-5pm.....	Technical Sessions
5pm-6:30pm.....	Poster Session
5:30pm-8pm.....	Socials and Agency Family Meetings
8pm.....	Dance

### WEDNESDAY, FEBRUARY 15TH

8am-9am.....	Plenary
9am-9:30am.....	Coffee Break in the Main Lobby
9:30am-11:30am.....	Technical Sessions
11:30am-1pm.....	Lunch
1pm-3pm.....	Technical Sessions
3pm-6pm.....	SRM Honor and Student Awards

### THURSDAY, FEB. 16TH

All Day.....	Tours SRM BOD Meeting
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## TRADE SHOW DETAILS

We welcome all meeting participants to this year's Trade Show! **Located in the Grand Ballroom AB**, the Trade Show will begin on Sunday evening with the Trade Show Mixer, and all-day Monday and Tuesday. This year, the Trade Show will serve as host to the two Poster Sessions taking place, Rangeland Cup, coffee breaks, and our first-ever Trade Show Mixer Lunch. In addition to commercial companies, government agencies, non-profit organizations, and universities, we will also serve as host to a number of local artisans. Don't miss out!

**Trade Show Mixer:** Sunday evening, from 6pm-8pm, don't miss out on our kickoff to this year's meeting at the Trade Show Mixer! Cash bar and food stations will be available.

**Trade Show Lunch Mixer:** A first-time event, on Monday, stop by the Trade Show for lunch! Complimentary food stations will be available on a first come first served basis for all attendees.

**Daily Coffee Breaks:** Come get your coffee/tea fix in between meetings on Monday and Tuesday in the morning (after the Plenary) and afternoon (3pm).

### TRADE SHOW HOURS

Location: Grand Ballroom AB (Located next to Registration!)

### SUNDAY, FEBRUARY 12TH

12:00 PM — 6:00 PM.....	Booth Set-up
6:00PM — 8:00PM.....	Trade Show Mixer

### MONDAY, FEBRUARY 13TH

8:00 AM — 8:00 PM.....	Exhibit Hall Open
Noon.....	Lunch mixer in Trade Show
4:00 PM — 6:00 PM.....	Poster Session

### TUESDAY, FEBRUARY 14TH

8:00 AM— 6:00 PM.....	Exhibit Hall Open
4:00 PM - 6:00 PM.....	Poster Session
6:00 PM - 11:00 PM.....	Booth Tear Down



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## 2023 EXHIBITORS

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Gallagher NA  
Nofence Inc.  
U.S. Roundtable For Sustainable Beef  
Giant Rubber Water Tanks  
Biowest AG Solutions  
National Drought Mitigation Center  
Nichino America, Inc  
Idaho Rangeland Resources  
Commission  
Idaho Rangeland Resources  
Commission  
CEHMM  
Bureau of Land Management Idaho  
National Experienced Workforce  
Solutions  
Granite Seed & Erosion Control  
GP Restoration Solutions Inc  
Working Lands Conservation  
Truax Company Inc  
Easy Fence LLC  
USDA Poisonous Plant  
Research Laboratory  
Ag-Renewal Inc  
USDA-ARS Forage and Range  
Research Unit  
Barenbrug  
ACF West  
SECO Ranch Planning  
National Grazing Lands Coalition  
University of Idaho Rangeland Center  
Western Landowners Alliance  
IMAGINE  
Open Range Consulting  
Great Basin Fire Science Exchange  
The Rangelands Partnership  
Mesa Co.  
SRM Leadership Initiative Task Force  
IYRP and IRC 2025  
USFS  
NRCS  
2024 SRM Annual Meeting  
Pawnee Butte Seeds  
Idaho Woolgrowers

Department of Forest, Rangeland and  
Fire Sciences at the University of Idaho  
Pheasants Forever & Quail Forever Seed  
and Plant Program  
University of Wyoming Range Club  
Corteva  
University of Nevada Range Club  
Idaho Cattlemen's  
Idaho Wildlife Federation  
American Society of Reclamation  
Sciences  
USDA - ARS Burns, OR

### 2023 ARTISANS

Baskets for Hay  
Deana Attebery  
Hatch Idaho Cinches  
JanyRae Seda Oil Painting  
Mary Arnold Art  
Cindi Walton  
Northern Plains Photography  
Ben Ternes  
Western Roan  
Debra Bruner Studio

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## TOURS

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Each tour will leave from southwest side of The Boise Centre on Front Street. There is a large pull-out area where each mode of transportation will pick up attendees. Please plan to arrive at the pick-up location 20 minutes prior to your tour.

### **Foothills Learning Center Monday, February 13; 2pm-4pm**

Rangelands are celebrated and used by many communities, including urban communities. The wildland-urban interface – WUI – consists of the lands around expanding urban centers and face unique pressures offered by their location. The Foothills Learning Center in Boise is an environmental education provider situated in the sagebrush ecosystem surrounding Boise. On this tour, you will be introduced to the Foothills Open Space Division and Ridge to Rivers trail programs, hike through Boise's foothills, and learn about the efforts being undertaken to educate the public about rangelands in the WUI.

### **Basque Center Dinner & Entertainment Monday, Feb. 13; 6-8pm**

Idaho is home to a thriving Basque community that has a rich history of sheepherding on Idaho rangelands. The Basque Block in Boise is home to many Basque restaurants and shops that feature cultural dishes and foods. Please join us for a celebration of Basque culture that includes spit-roasted lamb (come early to watch the process), traditional Oinkari dancers, and the Txan Txan accordian group. This promises to be a joyful and tasty event that celebrates our local Basque community and introduces us to their customs and, above all, food!

### **Basque Center Walking Tour Tuesday, February 14; 2-4pm**

Idaho is home to a thriving Basque community that has a rich history of sheepherding on Idaho rangelands. The Basque block in Boise is home to the Basque museum and a locus of Basque culture. On this tour, you will learn about this history of the Basque people in Idaho through a guided tour of the Basque block including the museum, the historic boarding house, and Idaho Basque's own Tree of Gernika. Local Basque historian and community member, John Bieter, will share the importance of rangelands to the Basque people and the ways the Basque community thrives in their home in Idaho.

### **World Center for Birds of Prey Wednesday, Feb. 15; 9:30am-1pm**

The World Center for Birds of Prey, located in Boise, Idaho, is the headquarters of The Peregrine Fund. The campus houses an administration building,

breeding facilities for critically endangered species, the Archives of Falconry, Velma Morrison Interpretive Center, and trails through the sagebrush steppe overlooking Boise and the Owyhee Mountains. Guests stand in the shadows of California Condors as they get a glimpse into the lives of the largest breeding flock, have a taste of the traditions and passion of falconry and ornithology that saved the Peregrine Falcon, and are invited to get nose-to-beak with eagles, falcons, hawks, owls, and vultures from around the world representing over 20 current global conservation efforts. Come prepared to fall in love with raptors in both outdoor and indoor exhibits.

**World Center for Birds of Prey + Conservation Area  
Thursday, Feb. 16; 8:30am-6pm**

Several of Idaho's fascinating ecological features will be explored on this tour. The day will begin with a visit to The Peregrine Fund's World Center for Birds of Prey to hear about raptor life history and conservation. Then take a ride to the Dedication Point overlook, which provides a great spot to view the area's famous birds of prey and listen to BLM biologists discuss the ecology and restoration of the Morley Nelson Snake River Birds of Prey National Conservation Area. You may even get to meet a raptor ambassador that's native to southern Idaho! The day will conclude with a visit to one of southwest Idaho's beautiful parks for additional wildlife viewing opportunities and a desert hike (weather allowing). This tour includes a boxed lunch and all transportation.

**Conception to Consumer Tour–  
Simplot/CS Beef Packers Tour  
Thursday, February 16; 7am-6pm**

The Beef Cattle Conception to Consumer Tour will highlight the efforts of the J. R. Simplot Company to match beef cattle production to consumer demands. This tour highlights the genetic selection and breeding targets that J. R. Simplot uses to match market demands as well as their range/forage and feedlot programs for efficient beef cattle production. The tour will feature stops at the new CS Beef Packers plant in Kuna Idaho and the Simplot Feedlot in Grandview, Idaho. Weather permitting, the tour will stop at the Bruneau Canyon Overlook and participants will be able to view rangelands managed by Simplot as well as to discuss collaborative efforts for rangeland management. If weather does not allow this stop to be made, a stop will be made at the Bruneau Sand Dunes, home of the tallest sand dune in North America. Additionally, the bus tour will pass through the BLM Paradigm Fuel Break Project corridor along the I-84 interstate and managers will explain how this project has been implemented to help reduce the occurrence of wildfire. An excellent tri-tip beef BBQ lunch by Grubbin BBQ will be part of this tour.

**PLENARY SCHEDULE**

**MONDAY, FEBRUARY 13TH**

**PLENARY – WORKING ACROSS BORDERS**

**8:00am.....Convene the Annual Meeting  
Embracing Rangelands without Borders**  
*Annual Meeting Planning Committee*

**Welcome to Idaho**  
*Governor Brad Little (Invited)/SRM President Karen Launchbaugh*

**Presentation of Colors starting the journey to the International Year of Rangelands and Pastoralists**  
*SRM International Affairs Committee*

**8:30am.....Working Across Borders  
Continental-Scale Conservation**  
*Tammy VerCauteren, Bird Conservancy of the Rockies Executive Director*

**Our Piece of the Puzzle**  
*David and Holly Ollila, Ranchers from South Dakota*

**Value of Working Lands**  
*Tate Lantz – (Moderator)  
South Dakota SRM*

**9:30am.....Bring to conclusion and enjoy the meeting**

**TUESDAY, FEBRUARY 14TH**

**PLENARY – WORKING ACROSS DISCIPLINES**

**8:00am.....Convene and Consider**

**8:10am.....Working Across Disciplines  
A Librarian's Role**  
*Jeanne Pfander, University of Arizona Librarian*

**A Rangeland Extension Perspective**  
*Tip Hudson, Washington State University Extension Professor*

**Empowering Interdisciplinarity**  
*Eric Winford – (Moderator)  
Idaho SRM*

**9:00am.....Bring to conclusion and enjoy the meeting**

## WEDNESDAY, FEBRUARY 15TH

### PLENARY – WORKING ACROSS ERAS

8:00am.....**Convene and Consider**

8:10am.....**Working Across Eras**

#### **Wisdom for the Future**

*Timothy Murphey, Retired State Director of Idaho Bureau of Land Management*

#### **Insight from the Next Generation**

*Courtney Taylor, Student and rancher from Alberta, Canada*

#### **Embracing Wisdom and Insight**

*Tracy Kupchenko - (Moderator)  
International Mountain SRM*

9:00am.....**Bring to conclusion and enjoy the meeting**

Society for Range Management



### POSTER SESSIONS

Don't miss out on the Poster Sessions!

Poster Session #1 will be held on Monday from 5pm-6:30pm.  
Poster Session #2 from 5pm-6:30pm on Tuesday. Located in the Tradeshow.

### DAILY COFFEE BREAKS

Come get your coffee/tea fix in between meetings on Monday and Tuesday in the morning (after the Plenary) and afternoon (3pm) in the tradeshow!

### PLENARY SPEAKER BIOS

Please join us each morning (Monday-Wednesday) for a Plenary Session that will kick-off each day's events. Plenaries will be located in the 400 Ballroom on the 4th floor. Monday Plenary will run from 8am-9:30am; with Tuesday and Wednesday each from 8am-9am. See below for a full list of each day's speakers and their respective bios.

#### PLENARY #1 | MONDAY, FEBRUARY 13TH

#### **Working Across Borders**

Many rangeland resources and ecological forces pay no attention to the ownership and political borders that humans put on maps. Effective land managers must work across borders to address rangeland realities including wildfire, weed invasion, wildlife, rivers and streams, and climate. Those who care for rangelands need to find partners and reach across borders to accomplish their goals. Tammy VerCauteren will describe the continental-scale efforts aimed at stitching together a future to sustain rangelands and migratory birds known as the Central Grasslands Roadmap. David Ollila and his family will talk about how they manage their South Dakota ranch with knowledge that they are a piece of a larger puzzle known as the Great Plains. Tate Lantz, a land management professional, will moderate this discussion to highlight the inherent value of working landscapes to maintain a healthy and productive continent.

#### **Tammy VerCauteren - Continental Scale Conservation**



Born in Michigan, Tammy earned a bachelor's degree in Wildlife Management from Michigan State University and a master's degree from the University of Nebraska-Lincoln where she studied Sandhill Cranes along the Platte River. She began working for Bird Conservancy of the Rockies (then known as the Colorado Bird Observatory) in 1999 as a specialist in GIS and landowner outreach for the Prairie Partners program. She has been Bird Conservancy's prairie partners coordinator and outreach director and has served as executive director since 2008. Tammy serves as the North American Bird Conservation Initiative Human Dimensions Subcommittee Chair, as well as past Chair of the Playa Lakes Joint Venture Management Board and Co-Chair of the Northern Great Plains Joint Venture Management Board. Tammy worked with partners to catalyze the Central Grassland Roadmap effort which started four years ago. She is on the planning team and active in several working groups of the roadmap including policy, communications and Indigenous. She enjoys working with partners and encouraging proactive voluntary efforts for species and habitat conservation, and believes it is relationships with people that will make a positive difference for conservation now and in the future. Tammy resides in Fort Collins, Colorado on the traditional homelands of the Ute, Arapaho, Cheyenne, and Sioux.

## David and Holly Ollila – Our Piece of the Puzzle

Dave and Holly Ollila are the 5th generation to ranch in Butte County, South Dakota. The ranch located south-east of Newell, SD runs sheep and cattle along with an irrigated hay base. Dave, Holly and their three sons have taken a holistic approach to life and production agriculture. The Ollilas have learned that rangeland/soil health is much more than a set of conservation practices, rather, it is a philosophy toward land resource management that includes a quality of life that is precious to the family. Managing the land resource by mimicking nature and natural processes has resulted in improved financial returns, more consistent forage production, and healthier soils has led to healthy animals. Improving native grasslands and increasing diversity in “go back” land and cropland has steadily increased organic matter, soil biological functions, while providing habitat for native species of insects and birds. The Family strongly believes this is the path to follow for the next generation to continue a high quality of life while ranching and meeting the environmental and societal demands for food production and security.



## Tate Lantz – Value of Working Landscapes



Tate Lantz was born in Winner, South Dakota and grew up on a cow-calf ranch. He earned a bachelor's degree in Range Science from South Dakota State University. He began working for the Natural Resources Conservation Service after graduation and has been with the Agency ever since. He has served as a Rangeland Management Specialist in Eastern and Western South Dakota. Tate is currently the Assistant State Conservationist for Field Operations with responsibilities for 16 Field Offices and 2 Tribal Offices in Western South

Dakota. Tate has worked with the Bird Conservancy of the Rockies and with partner groups and landowner/operators to provide insight to the Central Grassland Roadmap effort. Tate is an active SRM member and serves as chair of the SRM Endowment Fund Development Committee.

## PLENARY #2 | TUESDAY, FEBRUARY 14TH

### Working Across Disciplines

Rangeland science is not a single discipline it is a synthesis of several scientific topics and lived experiences. Successful management of rangelands requires knowledge of soils, water, climate, plant, livestock, wildlife, humans and much more. It is impossible to master all topics in a rangeland textbook or land management handbook. It takes a unique and confident person to recognize their limitations and reach across disciplines to accomplish the art of rangeland management. A successful example of this discipline mixing is the Rangeland Partnership which is a group of rangeland extension profes-

sionals and librarians who work side by side to make information available to land managers. Accomplishments of the Rangeland Partnership include the Rangeland Gateway and RangeDocs which are searchable databases to help rangeland managers find high quality information. In this plenary we will hear from Tip Hudson, a range-livestock extension specialist, and Jeanne Pfander, and agricultural librarian, who will discuss the value of reaching across disciplines and working in an interdisciplinary fashion. Eric Winford, Associate Director of the Rangeland Center, will moderate this discussion and bring to light the powerful value of working across disciplines.

## Tip Hudson – A Rangeland Extension Perspective

Tip Hudson is an Extension Professor at Washington State University in rangeland and livestock management. Tip received his bachelor's degree in rangeland ecology and master's degree in Natural Resources from the University of Idaho. He is an extension specialist of agriculture and natural resources stationed in Ellensburg, Kittitas County, Washington. Tip's work has focused on sustainable rangeland grazing, riparian grazing to support stream function and water quality, rangeland monitoring, and irrigated pasture management. Tip is well known as the host of the podcast Art of Range which provides education through conversation with some of the brightest minds in rangeland management and livestock production. In nearly 100 episodes, Tip has interviewed researchers, ranchers, and resource professionals to bring extended discussions on topics that are of interest to anyone who works on rangelands. Tip is also an active member of SRM and serves on the Board of Directors.



## Jeanne Pfander – A Librarian's Role



Jeanne Pfander, Associate Librarian at the University of Arizona, provides assistance and support for the information needs of students, faculty, and staff in the College of Agriculture and Life Sciences. She holds a bachelor's degree in biology from Stephens College, a master's degree in library science from the University of Missouri and a graduate certificate in digital information management from the University of Arizona. She has been an active participant since the beginning of what is now known as the Rangelands Partnership – a multi-state collaboration of rangeland specialists and librarians. In addition to enjoying her work as a librarian, Jeanne loves reading (of course!) and being outdoors with her husband, family and friends - hiking, biking and kayaking!

## Eric Winford – Empowering Interdisciplinarity

Eric Winford has been the Associate Director of the Rangeland Center since 2017. In this role, Eric manages Center operations and coordinates research and outreach teams. Prior to this position, Eric worked at the Washington Depart-

ment of Natural Resources as the Teanaway Community Forest Planner. Originally from Tennessee, Eric moved west in 2002 and spent several years working for the US Forest Service, the National Park Service, and a conservation district as he moved around several western states. Eric has a bachelor's degree from the University of Tennessee, a master's degree from the University of California, Davis and is currently working on a PhD in Natural Resources at the University of Idaho. Eric is widely respected for his broad knowledge of range and natural resources, and he is incoming president of the Idaho Section of SRM.

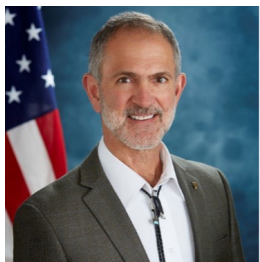


**PLENARY #3 | WEDNESDAY, FEB. 15TH**

**Working Across Eras**

A future for the wise management and conservation of rangelands will require knowledge from the hard-earned experience of those near retirement and the fresh and uninhibited ideas of young professionals. However, reaching across these generations of ideas and experiences can be challenging. This final plenary will be a thought-provoking discussion that highlights the value of combining well-lived experiences with youthful insight. Tim Murphey, retired rangeland and fire professional, will describe the concepts he has learned that will be valuable to plot a path into the future of rangeland management. Courtney Taylor, student and rancher, will highlight the insight that young professionals can bring to power innovation and engage the next generation of rangeland managers. Tracy Kupchenko will moderate this discussion based on her pivotal experiences in working with both youth and well-worn ranchers and rangeland managers.

**Tim Murphy – Wisdom for the Future**



Tim Murphy is recognized for his long and impactful career in rangeland and fire management. Tim completed a bachelor's degree in rangeland management from the University of Wyoming and after graduation Tim began a 39-year career in rangeland and natural resources management. Tim's career began as a range technician with the Bridger-Teton National Forest and shortly thereafter he joined the Bureau of Land Management (BLM) at the Green River Resource Area managing public rangelands in southwest Wyoming, followed by supervising a range, wild horse, and soils team at BLM's Caliente Resource Area, Nevada. Tim went on to management positions with BLM in New Mexico at the Carlsbad and then Las Cruces Resource Areas followed by a District Manager assignment at Miles City, Montana. Throughout his assignments Tim was active in wildland fire management as a firefighter and was called upon to inform national policy through the results of his leadership involving fatality and serious accident investigation teams. Tim went on to Boise, Idaho as the

Director of Fire and Aviation at the National Interagency Fire Center followed by becoming the BLM Idaho State Director. After retiring from the BLM, he has remained active in promoting wise land management that supports local economies and healthy landscapes. Tim is currently chairman of the Idaho Fish and Game Commission.

**Courtney Taylor – Insights from the Next Generation**

Courtney Taylor grew up on a cattle ranching operation near Warner, Alberta, Canada. Always ambitious and a self-starter, she was running her own profitable on-farm businesses including a small sheep flock and orphan calf operation by age 10. Through her family operation, she was introduced to the art of rangeland management, and then while attending the Southern Alberta Youth Range Days camp, she further explored the science behind beneficial management practices, potential careers, and opportunities associated with rangelands. Her first exposure to the Society for Range Management was through the High School Youth Forum, then again at the University level, participating in the student conclave and competitions like the Undergraduate Range Management Exam and Extemporaneous Speaking event. She is currently attending the University of Saskatchewan and continues to run several of her business initiatives including a small bull operation specializing in genetics that will sustain the extensive winter grazing and spring/summer calving utilized on the ranch. Needless to say, that as far back as she can remember, she has grown and continues to foster a deep respect for her animals and the land on which her family cattle ranch depends.



**Tracy Kupchenko – Embracing Wisdom and Insight**



Tracy Kupchenko achieved a bachelor's degree in Agriculture from the University of Alberta. Throughout her 20-year career, she has had the opportunity to work for various regulatory agencies in Alberta in both grazing management and reclamation capacities, focusing on the Grasslands region of the province. Tracy has worked for the Alberta Energy Regulator as the Subject Matter Expert for Grasslands, as an Assessor with the Oil and Gas Reclamation group. Her current role is with the Government of Alberta as the Team Lead for Rangelands- Prairies Area. Tracy and her team manage the grazing dispositions on Public Lands in southeastern Alberta (approximately 4 million acres of grasslands). As well as leading a team of Range Agrologists, she is also responsible for the provincial grazing reserves (a.k.a community pastures) in southern Alberta. In addition to her daily work, she is an active member of the Society for Range Management, on the organizing committees for the Southern Alberta Youth Range Days, Alberta Stockman's Range Course, Grassland Restoration Forum and Prairie Conservation forum. When she isn't working, she enjoys working cattle with her horse and dog.

**STUDENT EVENTS**

**SUNDAY, FEB. 12TH**

- 9am-5pm.....SRM Job Fair**  
Room: 440  
*Students, young professionals, job seekers—come visit the SRM Job Fair to interact with employers and recruiters!*
- 8am-11pm.....Student Plant ID Study Room**  
Grove Hotel: Evergreen Ballroom
- 4pm-11pm.....High School Youth Forum**  
Home Room: Grove Hotel: Riverfork
- 5pm-6pm.....Student Conclave Social**  
Room: 110CD
- 5pm-6pm.....New Members Welcome Event**  
Main Lobby of the Boise Centre  
*Are you a new, or new-ish, member to SRM? Stop by the New Members Welcome event to hear how to get involved with SRM, what to expect at the Annual Meeting and more!*

**MONDAY, FEB. 13TH**

- All Week.....Outreach and Recruitment for Agency Jobs**  
Room: 440
- 6am-11pm.....High School Youth Forum**  
Room: Grove Hotel: Riverfork
- 6am-11pm.....Student Plant ID Study Room**  
Grove Hotel: Evergreen Ballroom
- 8am-11am.....URME Exam**  
Grove Hotel: Aspen/Cedar
- 10am-4pm.....Extemporaneous Speaking Room #1 (Undergrad)**  
Room: 430A
- 10am-4pm.....Extemporaneous Speaking Room #2 (Undergrad)**  
Room: 430B
- 11:30am-Noon.....Student Conclave and YPC Business Lunch**  
Room: Junior Ballroom

*Come on by for this year's joint Business Meeting lunch for YPC and the Student Conclave!*

- 3pm-6pm.....Rangeland Cup**  
Grand Ballroom AB (In the trade show!)

**TUESDAY, FEB. 14TH**

- All Week.....Outreach and Recruitment for Agency Jobs**  
Room: 440
- 6am-11pm.....High School Youth Forum**  
Room: Grove Hotel: Riverfork
- 8am-Noon.....Plant ID Exam**  
Grove Hotel: Evergreen Ballroom
- 9:30am-5pm.....High School Youth Forum Paper Presentation**  
Room: 120A

**WEDNESDAY, FEB. 15TH**

- All Week.....Outreach and Recruitment for Agency Jobs**  
Room: 440
- 6am-11pm.....High School Youth Forum**  
Home Room: Grove Hotel: Riverfork
- 9:30am-11:30am.....Extemporaneous Speaking Contest (Undergrad)**  
Room: 120A
- 3pm-6pm.....SRM Honor and Student Awards**  
400 Ballroom

**DON'T FORGET!**

*YPC Wildtrags are available!*

**\$40 for brand donors**

**\$45 for non-donors**

## SOCIAL EVENTS

### SUNDAY, FEB. 12TH

- 5pm-6pm.....**New Members Welcome Event**  
Main Lobby of the Boise Centre
- 6pm-8pm.....**Trade Show Mixer**  
Grand Ballroom AB

### MONDAY, FEB. 13TH

- 11:30am-1pm.....**Trade Show Mixer Lunch**  
Grand Ballroom AB
- 11:30am-1pm.....**Past President's Lunch**  
Room: The Grove Hotel; Cattail Boardroom
- 6pm-8pm.....**Basque Center Dinner and Entertainment**  
Offsite, additional cost

### TUESDAY, FEB. 14TH

- 5:00PM-6:00PM.....**Univ. of Alberta & Univ. of Saskatchewan Student Team Social**  
Room: 410C
- 5:30PM-6:30PM.....**Idaho Social**  
Room: 120A
- 5:30PM-7:30PM.....**University of Arizona Social and Friends**  
Room: 120B
- 5:30PM-7:30PM.....**Utah State University Social**  
Room: 120C
- 5:30PM-7:30PM.....**Colorado State University Social**  
Room: 410A
- 5:30PM-7:30PM.....**University of Wyoming Social**  
Room: 410B
- 6:00PM-7:00PM.....**ARS Family Meeting**  
Room: 100D
- 6:00PM-7:30PM.....**Bridging the Gap**  
Room: 430
- 6:30pm-8:00pm.....**USFS Family Meeting**  
Room: 110AB

- 6:30pm-8:00pm.....**NRCS Family Meeting**  
Room: 110 CD
- 6:30pm-8:00pm.....**BLM Family Meeting**  
Room: 100E
- 8:00pm-11:00pm.....**Dance**  
Junior Ballroom  
*Don't miss out on this year's dance and this year's entertainment and band The Country Club!*

### WEDNESDAY, FEB. 15TH

- 6:30am-7:30am.....**Fun Run**  
Offsite—Meet at the lobby of The Grove Hotel to start  
*Come join us for the Annual Fun Run to start your day off right!*

## FULL SCHEDULE

*All times noted are in Mountain Standard Time*

Events taking place prior to the Boise in-person meeting: both events will be accessible via Zoom and recorded.

### MONDAY, FEBRUARY 6TH

- 8am-11am (MT).....**International Affairs Committee Meeting**

### TUESDAY, FEBRUARY 7TH

- 8am-Noon.....**Symposium: Global Issues Influencing Success for the International Year of Rangelands and Pastoralists (IYRP), 2026 and Beyond**

**Description:** The IYRP 2026 has been approved by the UN and endorsed by SRM (<https://iyrp.info/>). In the run-up to 2026, key issues are being identified that will influence the success of the IYRP in terms of promoting sustainable global rangelands. This symposium will put a spotlight on six important topics that variously affect all 11 global regions.

- Igshaan Samuels, Maryam Niamir-Fuller, et al.: Introduction to the symposium and reflections on the challenges of regional action planning for sustainable rangelands. (15 min)
- David Briske, et al.: Global rangeland stewardship needs transformational change. (15 min)

- Batkhisig Baival, et al.: Strategies for global certification of rangeland products. (15 min)
- Jurgen Hoth, et al.: Challenges of building communication networks in support of sustainable global rangelands. (15 min)
- Michael Odhiambo, et al.: Equitable water governance for sustainable global rangelands. (15 min)
- Susanne Vetter, et al.: Challenges regarding afforestation of the world's rangelands. (15 min)

## SATURDAY, FEBRUARY 11TH

**8am-5pm.....SRM Board of Directors Meeting**  
Executive Boardroom, Boise Centre

## SUNDAY, FEBRUARY 12TH

**7am-8am.....2023 Planning Committee**  
Room: 140

**4pm-12:00am.....HSYF Home Room**  
Grove Hotel, Riverfork

**9am-5pm.....SRM Job Fair**  
Main Lobby, Boise Centre

**6am-11pm.....Student Plant ID Study Room**  
Grove Hotel: Evergreen Ballroom

**8am-11:30am.....Range Science Education Council (RSEC)**  
Room: 110AB

**8am-Noon.....Finance Committee**  
Room: 120B

**8am-12pm.....Membership Committee**  
Room: 120C

**8am-5pm.....Advisory Council**  
Room: 110CD

**10am-Noon.....GLC Committee**  
Room:120A

**10am-12pm.....CPRM Committee**  
Room: 430A

**11am-1pm.....Awards Committee**  
Room: 430A

**12pm-2pm.....Geospatial Science and Technology Committee**  
Room: 120C

**12pm-2pm.....CRMC Committee**  
Room: 120A

**12pm-1pm.....Joint Finance & Endowment Committee**  
Room: 120B

**1pm-3pm.....Program Accreditation Committee**  
110AB

**1pm-4pm.....SRM Leadership Initiative**  
Room: 430A

**1pm-4pm.....Policy and Public Affairs Committee (PPAC)**  
Room: 100E

**2pm-4pm.....Outreach, Communications, and Website (OCW)**  
Room: 120A

**2pm-4pm.....Targeted Grazing Committee**  
Room: 120C

**3pm-4pm.....Livestock Foraging Behavior Committee**  
110AB

**5pm-6pm.....Student Conclave Social**  
Room: 110CD

**5pm-6pm.....New Members Welcome Event**  
Room: Main Lobby, Boise Centre

**6pm-8pm.....Trade Show Mixer**  
Room: Grand Ballroom AB

## MONDAY, FEBRUARY 13TH

**7am-8am.....2023 Planning Committee**  
Room: 140

**8am-9:30am.....Plenary**  
Room: 400 Ballroom

**8am-6pm.....Trade Show**  
Room: Ballroom AB

**9:30am-10am.....Break: Coffee provided in the Tradeshow**  
Room: Ballroom AB

**9:30am-5p.....Outreach and Recruitment for Agency Jobs**  
Room: 440



**6am-11pm.....Student Plant ID Study Room**

Room: Grove Hotel, Evergreen Ballroom

**8am-Noon.....URME**

Room: Grove Hotel, Cedar Ballroom

**10am-4pm.....Extemporaneous Speaking #1 (Undergrad)**

Room: 430A

**10am-4pm.....Extemporaneous Speaking #2 (Undergrad)**

Room: 430B

**Symposium: (Full day Session) The emerging urgency of fuel breaks: developing a better understanding of likely impacts on wildfire, plants, wildlife, and people (Organizer: Strand)**

Room: 120A

**Description:** To combat increasingly large and frequent fires in the Great Basin, thousands of miles of fuel breaks are being implemented as a key management strategy. This symposium will provide a synthesis of fuel break performance and their impacts on rangeland ecology. Presentations will cover the following topics: 1) fuel break efficacy in modifying fuel loads, altering fire behavior, and limiting fire spread; 2) effects of fuel breaks on adjacent plant communities (including invasives) and wildlife; 3) fuel break design and treatment options (e.g., targeted grazing, herbicide application); and 4) management considerations of fuel breaks.

**10:00-10:10am.....Doug Shinneman and Eva Strand**

*Introduction: Future direction of fuel break science and management in sagebrush rangelands*

**IMPORTANCE OF FUEL BREAKS**

**10:10-10:30am.....Erik Kriwox**

*"Fuel break management and maintenance considerations"*

**10:30-10:45am.....Kayla Johnston (University of Idaho)**

*"Evaluation of greenstrip linear fuel breaks in the Twin Falls BLM District (South-Central Idaho)"*

**10:45-11:00am.....Morgan Roche et al. (CSU)**

*"A spatial data synthesis of fuel breaks in relation to wildfire, invasive annual grasses, and sagebrush obligate wildlife"*

**11:00-11:20am.....Mike Guerry (RFPA/Idaho Rancher)**

*"Importance of fuel breaks during operations of a Rural Fire Protection Association"*

**Discussion.....Led E. Strand and D. Shinneman**

*Opening discussion re: fuel break importance and concerns*

**Symposium: What role do rangelands play in climate neutrality for beef production? (Organizer: Derner)**

Room: 120B

**Description:** Contemporary commitments by many entities for climate neutrality by a certain year in the near future raises questions for the role of rangelands in these climate neutrality pledges for beef production. We will showcase the extent of these climate neutrality pledges, present current analyses from life cycle assessments, identify research and knowledge gaps, and provide a path forward for integrated systems approaches to assist with science-informed and data-driven solutions.

*Each speaker will have a total of 30 minutes*

*(20 minutes presentation with 10 minutes for questions)*

- What are climate neutrality commitments, who is making them, and what do they mean? (Sara Place)
- What do Life Cycle Analyses tell us about climate neutrality for beef production? (Greg Thoma)
- Identifying research and knowledge gaps – what about rangelands in climate neutrality? (Justin Derner, Stacey Gunter, and Gonzalo Irisarri)
- A path forward: integrated systems-level approaches ("birth to plate") for solutions that are desired by society. (Logan Thompson and Kim Stackhouse-Lawson)

**Workshop: VGS User Group Workshop (Organizer: Hall)**

Room: 120C

**Description:** VGS is a free software application designed for recording and managing ecosystem sampling data. The program provides customizable quantitative (species composition, frequency, ground cover, etc.) and qualitative (surveys) data collection options as well as rapid analysis and reporting. Version 5 of VGS was published for distribution and includes new features like two-way syncing. VGS Online was also recently released and provides users with the option of using an online data repository for storing, managing, and reporting their data using the standard folder structure, as well as spatially from maps. The workshop will provide a live demonstration of VGS for current or interested users, answer questions current users may have, give general tips and tricks for using the program, and update users on the future of VGS.

MONDAY, FEB. 13TH

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**Presenters: Ashley Lauren Hall and Charles Perry**

**10am-3pm.....Workshop: Range Sheep Production Systems: Current trends, issues and innovations (Organizer: Macon)**

Room: 110AB

**Description:** Range sheep production systems are a long-standing, but often misunderstood, component of rangeland landscapes across the Western US and beyond. Our session includes academic and practitioner presentations and is organized around three driving questions. First, what are range sheep production systems and how are they changing? Second, what are the biggest challenges and opportunities for producers and managers working in range sheep systems? Finally, what new and creative ways are range sheep systems innovating and adapting to change?

- Welcome and Regional Setting - Mike Guerry, Idaho Sheep Producer (20 min)
- The Sheep Industry in the 21st Century - Dan Macon, UC Cooperative Extension (30 min)
- From Forage to Fiber: Innovations in Wool - Brent Roeder, MSU Extension Sheep Specialist (20 min) (invited)
- Innovations in Range Sheep Diet Selection Research - Melinda Ellison, University of Idaho Extension (30 min)
- Not Just Little Cows: What We Know About Rangeland Sheep Diets - Derrick Scasta, University of Wyoming (30 min) (invited)
- Current Research at the US Sheep Experiment Station - Brett Taylor and Hailey Wilmer, USDA ARS (20 min)
- Innovators Panel: Producers and Stewards (60 min)
  - John Helle, Duckworth Wool (invited)
  - Reed Anderson, Anderson Ranches
  - Bianca Soares, Talbott Sheep/Star Creek Land Stewards

MONDAY, FEB. 13TH

**10am-3pm.....Workshop: Invasive Annual Grass Management: From Satellites to Surveys to Spray Decisions (Organizer: Mealor)**

Room: 110CD

**Description:** Management of invasive annual grasses has become an important focus for land managers conserved with agricultural production and conservation of natural resources. While broad-scale principles have been articulated (i.e. “defend and grow the

core”) and new remote sensing products have supported regional prioritization efforts, clearly linking those concepts and tools to on-the-ground decision has been somewhat lacking. In this workshop, we will demonstrate remote sensing products, discuss how prioritization decisions may vary among locations, provide monitoring considerations when planning annual grass treatments, and hear from land managers who are actively controlling annual grasses at landscape scales.

- Introduction - Brian Mealor
- Regional strategies: Defend and Grow the Core - Jeremy Maestas, Lindy Garner
- Discussion
  - Eyes in the sky: Remote sensing for strategic planning
  - Rangeland Analysis Platform – Brady Allred
  - RangeView – Harry Quicke or other Envu (formerly Bayer) rep
  - Planet Labs Imagery – Octave Lepinard
  - Forecasting future invasion risk
  - Inhabit risk modeling – Catherine Jarnevich
- DISCUSSION
  - One man’s junk...: Prioritization and how it may differ according to goals
  - Threat-based Management in Oregon – Megan Creutzburg
  - Idaho Cheatgrass Challenge – TBD
  - Wyoming Invasive Grasses Task Force – Brian Mealor
  - What’s in the toolbox?
  - Grazing to mitigate invasive annual grasses – Barry Perryman or Paul Meiman
  - Getting the most out of herbicides – TBD
  - Seeding in areas with low recovery potential – TBD
  - Using monitoring data to adapt management – Jaycie Arndt
  - Implementation – lessons learned from experience
  - Northeast Wyoming Invasive Grasses Working Group
  - Outcome-based grazing project example (Idaho or Oregon)
  - Sublette County Cheatgrass Task Force

MONDAY, FEB. 13TH

**10am-3pm.....Workshop: Walking the borderline: How crossing, eliminating, or acknowledging boundaries can lead to positive change in rangelands [Diversity & Inclusion Forum] (Organizer: Dial)**

Room: 420B

**Description:** Rangeland conservation is a challenge that surpasses societal boundaries, yet those working in rangelands are often separated by physical, language, or cultural barriers. What can happen when we choose to cross, eliminate, or simply recognize these societal borders? We will hear from speakers who have navigated such borders in rangeland conservation – striving to work across countries, languages, or cultures. A panel Q&A and participant discussion will follow to explore these experiences, identify key take aways, and discuss how we can use these lessons to enhance our day-to-day management, conservation, and enjoyment of rangelands.

**CONTRIBUTED ORAL SESSION: RIPARIAN AND WATER RESOURCES**

Room: 410A

- 10am-10:15am.....Benjamin Menapace**  
*Evaluating Changes in Riparian Complex Ecological Sites Over Time*
- 10:15am-10:30am.....Mary Rowland**  
*What Drives Cattle to Water? Accounting for Summer Riparian Use to Inform Management*
- 10:30am-10:45am.....David Bohnert**  
*Supplement Type and Factors Affecting Use by Cattle in a Montane Riparian Pasture*
- 10:45am-11am.....Lia Qin Ryan Ossanna**  
*Using rock detention structures to slow erosion in ephemeral streams: A 10-year case study*
- 11am-11:15am.....James Dobrowolski**  
*Water Quality and Quantity Programs of USDA-NIFA Supporting Rangeland Science and Management*
- 11:15am-11:30am.....Gregg Simonds**  
*How Proper Grazing Management Can Improve Water Security*

**CONTRIBUTED ORAL SESSION: FIRE, SESSION 1 OF 2**

Room: 410B

- 10am-10:15am.....Lauren Svejcar**  
*Post-fire recovery of native and introduced plant species across an elevation gradient*
- 10:15am-10:30am.....Theresa Becchetti**  
*Shrub encroachment effects on wildfire potential (incidence) in*

*California's Wildland Urban Interface*

- 10:30am-10:45am..... Jacqueline Ott**  
*Sagebrush survival following spring prescribed fire at the ecotone of sagebrush steppe and mixed-grass prairie in northeastern Wyoming*
- 10:45am-11am.....Troy Ocheltree**  
*Nutrient availability and plant responses to fire-induced sagebrush mortality at the sagebrush steppe/mixed-grass prairie ecotone*
- 11am-11:15am.....Jonathan Bates**  
*Early succession after prescribed fire in low sagebrush steppe*
- 11:15am-11:30am.....Jacob E Powell**  
*Vegetative Fuel Break Establishment and Effectiveness in the Columbia Plateau*

**CONTRIBUTED ORAL SESSION: RESTORING RANGELANDS, SESSION 1 OF 3**

Room: 410C

- 10am-10:15am.....Juan-Gilberto Garcia-Cancel**  
*The effects of Mexican feathergrass density on blue grama seedlings*
- 10:15am-10:30am.....Amber Johnson**  
*Breaking dormancy and increasing restoration success of native forbs with innovative seed coating and planting techniques*
- 10:30am-10:45am.....Scott Shaff**  
*Ten-year ecological responses to fuel treatments within semiarid Wyoming big sagebrush ecosystems*
- 10:45am-11am.....Matthew Rinella**  
*Theory of seed mix design with applications to rangeland restoration*
- 11am-11:30am.....Tolibjon Mukimov**  
*SELECTION OF BREEDING SOURCES FROM PROMISING SPECIES OF ASTRAGALUS ORGANIZATION OF SOWING OF PROMISING DESERT-FORAGE PLANT SPECIES*

**CONTRIBUTED ORAL SESSION: GRAZING, SESSION 1 OF 5**

Room: 420A

- 10am-10:15am.....Abbigail Rodgers**  
*Grazing intensity and fire frequency effects on plant species and community characteristics in tallgrass prairie*
- 10:15am-10:30am.....Sherman Swanson**  
*Contrasting Grazing Management for Livestock Versus*

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Free-Roaming Horses and Burros

**10:30am-10:45am.....Sherman Swanson**  
*Sustaining Riparian Functions with Management of Livestock and Free-Roaming Horses and Burros*

**10:45am-11am.....Amy Nagler**  
*Labor Changes in Beef Production: A Social and Economic Investigation of Labor Market Shifts*

**11am-11:15am.....Justin Clarke**  
*Avian Nesting Communities and Success in a Heterogeneity-based Rotational Grazing System*

**11:15am-11:30am.....Matt Rinella**  
*Early calving benefits livestock production under winter and spring warming*

**11:30am-1pm.....Student Conclave and YPC Business Lunch**  
Room: Junior Ballroom

**Past President's Lunch**  
Room: Grove Hotel: Cattail Boardroom (3rd floor)

**Trade Show Mixer Lunch - Open to all attendees**  
(complimentary food available on a first come first served basis)  
Room: Grand Ballroom AB

**-- 1:00 PM-3:00 PM --**

**Symposium: The emerging urgency of fuel breaks: developing a better understanding of likely impacts on wildfire, plants, wildlife, and people**  
(Organizer: Strand)  
Room: 120A

**PLANNING AND ASSESSMENT**

**1:00pm-1:15pm.....Jason Kreitler et al. (USGS)**  
*"A return-on-investment approach for evaluating Great Basin fuel break priorities - Optimizing fuel break placement/implementation using fire behavior modeling and other spatial considerations"*

**1:15pm-1:30pm..... Peter Coates et al. (USGS)**  
*"A retrospective assessment of fuel break effectiveness for containing rangeland wildfires in the western U.S."*

**1:30pm-1:45pm.....Matt Germino and Jake Price (USGS)**  
*"Vegetation and modeled fire response to fuel breaks installed in and around recently burned areas: critical inference for breaking the annual-grass fire cycle"*

**1:45pm-2pm.....Cali Roth et al. (USGS)**  
*"A comprehensive fuels treatment database for novel inferences and applications in wildfire management across the western U.S."*

**2pm-2:15pm.....Jesse Young (USFS)**  
*"The success of fuel breaks in the containment of large wildfires vary across fuel break and weather conditions"*

**2:15pm-2:30pm.....Julie Heinrichs et al. (CSU)**  
*"HexFire: Simulating fire spread and interactions with fuel breaks"*

**2:30pm-2:45pm.....Karen Short (USFS)**  
*"Fuel break scenario planning informed by quantitative assessment of transmitted wildfire risk in the Great Basin, USA"*

**2:45pm-3pm.....Erin Buchholtz et al. (USGS)\***  
*"Assessing large landscape patterns of potential fire connectivity using circuit methods"*

**Symposium: Understanding the potential (risks) of carbon ranching to mitigate climate change (Organizer: Reinhart)**  
Room: 120B

**Description:** The symposium will review the potential and challenges for the practice of carbon (C) ranching, where ranchers are paid to alter their management to increase soil C sequestration. Speakers will discuss the measurement, reporting, and verification of soil C sequestration projects. They will get into the weeds on C ranching including how practices, soil properties, and more impact soil C sequestration. Speakers will explore a range of causal drivers (and indicators) that likely underpin whether a shift in livestock grazing will increase accrual (or turnover) of soil C for a specific system and timespan.

**1pm-1:15pm.....Machmuller, M.**  
*"Soil carbon sequestration potential in grazing lands- from theory to practice"*

**1:15pm-1:30pm.....Sanderman, J., Xia, Y., Hernandez-Yañez, H., Watts, J., Cotrufo, F., Ewing, S., Machmuller, M.**  
*"Measuring soil carbon on the range: Challenges and*

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*emerging approaches”*

- 1:30pm-1:45pm.....**Dietz, C., Sanford, G., Jackson, R.**  
*“Soil C change in restored prairie of southern Wisconsin”*
- 1:45pm-2pm.....**Reinhart, K., Sanni Worogo, H., Rinella, M., & Vermeire, L.**  
*“Lessons from a next generation carbon ranching experiment in US Northern Great Plains”*
- 2pm-2:15pm.....**Lucas, J.\***  
*“Rangeland carbon storage in the face of multiple global change factors”*
- 2:15pm-2:30pm.....**Bagchi, S.\***  
*“Soil carbon under livestock and wild herbivores”*
- 2:30pm-2:45pm.....**Wilson, C.**  
*“Carbon farming on grazing lands? A social-ecological systems perspective on the promises and perils of putting pasture and rangeland into carbon offset trading markets”*
- 2:45pm-3pm.....**Discussion**

**Symposium: Fire and herbivory for restoring and maintaining the delivery of ecosystem services in rangelands (Organizer: Kreuter)**

Room: 120C

**Description:** Fire and herbivory are major interdependent drivers of rangeland ecosystems globally. Historically, they have often been addressed singularly and not in combination as necessary disruptive events in grassland and savannas. Widespread land use conversion, fire suppression and overgrazing by sedentary domestic livestock have led to widespread degradation of these former resplendent ecosystems. The purpose of the symposium is to concomitantly address the need for broader use of prescribed fire and environmentally responsible grazing management practices to mitigate wildfire risks and restore diverse rangelands that provide services upon which human well-being is predicated.

- 1pm-1:15pm.....**Sam Fuhlendorf**  
*Pyric herbivory at landscape scale: Reconnecting fire and grazing in North America.*
- 1:15pm-1:30pm.....**Rheinhardt Scholtz et al.**

*High-intensity fire to manage shrub encroachment: Lessons from South Africa and the USA.*

- 1:30pm-1:45pm.....**Devan McGranahan et al.**  
*The case for burning rangeland pastures for sustainable livestock production.*
- 1:45pm-2pm.....**Richard Teague et al.**  
*Managing grazing to restore soil health, ecosystem function and ecosystem services.*
- 2pm-2:15pm.....**Carissa Wonkka et al.**  
*Socio-ecological context: Barriers to adoption of fire, getting producers to re-think grazing management and getting land management agencies to re-think post-fire grazing.*
- 2:15pm-2:30pm.....**Stephanie Larson**  
*Animal-based meat and rangeland ecosystem services: From range to plate.*
- 2:30pm-2:45pm.....**David Toledo**  
*An integrative assessment and management optimization system for grazing lands.*
- 2:45pm-3pm.....**Urs Kreuter**  
*An integrative framework to evaluate the use of prescribe fire and responsible grazing management for restoring the ecological functionality of grasslands.*

**10am-3pm.....Workshop: Range Sheep Production Systems: Current trends, issues and innovations (Organizer: Macon)–CONTINUED**

Room: 110AB

**Description:** Range sheep production systems are a long-standing, but often misunderstood, component of rangeland landscapes across the Western US and beyond. Our session includes academic and practitioner presentations and is organized around three driving questions. First, what are range sheep production systems and how are they changing? Second, what are the biggest challenges and opportunities for producers and managers working in range sheep systems? Finally, what new and creative ways are range sheep systems innovating and adapting to change?

- Welcome and Regional Setting - Mike Guerry, Idaho Sheep Producer (20 min)

- The Sheep Industry in the 21st Century - Dan Macon, UC Cooperative Extension (30 min)
- From Forage to Fiber: Innovations in Wool - Brent Roeder, MSU Extension Sheep Specialist (20 min) (invited)
- Innovations in Range Sheep Diet Selection Research - Melinda Ellison, University of Idaho Extension (30 min)
- Not Just Little Cows: What We Know About Rangeland Sheep Diets - Derrick Scasta, University of Wyoming (30 min) (invited)
- Current Research at the US Sheep Experiment Station - Brett Taylor and Hailey Wilmer, USDA ARS (20 min)
- Innovators Panel: Producers and Stewards (60 min)
  - John Helle, Duckworth Wool (invited)
  - Reed Anderson, Anderson Ranches
  - Bianca Soares, Talbott Sheep/Star Creek Land Stewards

**Workshop: (10am-5pm) Invasive Annual Grass Management: From Satellites to Surveys to Spray Decisions**

**(Organizer: Mealor)–CONTINUED**  
Room: 110CD

**1pm–1:15pm.....Craig Hossfeld - RangeView Product Manager, Envu**  
*RangeView Digital Solution*

**1:15pm-1:30pm.....Octave Lepinard – Planet Andrea DeStefano, Chloe Mattilio, Brian A. Mealor – University of Wyoming IMAGINE**  
*Evaluating High-Frequency, Moderate-Resolution Satellite Imagery for Remote Sensing of Invasive Annual Grasses*

**1:30pm–1:45pm.....Catherine S. Jarnevich, Peder Engelstad, Terri Hogan, Ian Pearse, Jennifer Sieracki, Helen R. Sofaer, Jillian LaRoe, Janet S. Prevéy, and Nicholas E. Young**  
*Invaders at the doorstep: using INHABIT invasive plant models to focus watch lists*

**1:45pm–2:00pm.....Megan Creutzburg, Institute for Natural Resources, Oregon State University**  
*Spatial planning for landscape-scale management of invasive annual grasses in Oregon*

**2pm–2:15pm.....Brian A. Mealor – University of Wyoming IMAGINE, Ian Tator – Wyoming Game and Fish**

**Department, Slade Franklin – Wyoming Department of Agriculture**

*Strategic, Landscape-scale Invasive Annual Grass Management in Wyoming*

**2:15pm–2:30pm.....DISCUSSION**

**2:45pm–3pm.....Paul Meiman (presenter), Barry Perryman and Brad Schultz**  
*Management Considerations for Targeted and Prescribed Livestock Grazing of Cheatgrass*

**1pm-5pm.....Symposium: Producer & Young Producer’s Symposium: Rangelands Across the World (Organizer: Orozco)**  
Room: 100D

**1pm-5pm.....Workshop: Stakeholder Engagement for the International Year of Rangelands and Pastoralists (IYRP) 2026: Action Planning Workshop for the North American Region (Organizer: Coppock)**  
Room: 100E

**Description:** The IYRP 2026 has been approved by the UN and endorsed by SRM (<https://iyrp.info/>). The agenda of the IYRP is to promote sustainable rangeland systems across 11 geographical regions worldwide. Global planning has started. This workshop will facilitate a planning process for the North American Region—including the USA, Mexico, and Canada—where stakeholders describe the priority challenges they face, potential ways to make progress, and their preferred means of communication and collaboration. To achieve this outcome, the event will engage representatives of SRM’s 21 sections along with key GOs and NGOs using in-person and virtual formats.

**Symposium: Global perspectives on using geospatial approaches for rangeland ecology and management (Organizer: Perotto)**  
Room: 420A

**Description:** Climate change, woody cover encroachment, invasive species and current threats are affecting rangeland health and function. The use of geospatial technologies worldwide has opened new opportunities to gain a better understanding of the spatial and temporal landscape dynamics in rangelands. Moreover, we can monitor

how landscape level management changes can affect woody cover distribution, habitat for wildlife, and forage availability. We want to promote a global understanding of the role that geospatial technologies is having in rangeland research and management.

- Humberto L. Perotto (US): Multiple-scale approaches to understanding invasive species dynamics in rangelands.
- Luciano Gonzalez (Australia): Geospatial technologies for rangeland ecology and management: What have we learned and how do we use them?
- Jason Karl (US): Tangled in complexity: can a simpler, cheaper approach to virtual fencing manage livestock effectively on open rangelands?
- Sean Cunningham (US rancher) and Sergio Arispe (US): A Producer's Perspective on Applying Geospatial Technologies on Western Rangelands
- Leonor Calvo-Galvan (Spain): Fire severity assessment as a key factor in the analysis of wildfire effects
- José Manuel Fernández-Guisuraga (Spain): Monitoring ecological impacts of wildfires through novel multiscale remote sensing techniques

**CONTRIBUTED ORAL SESSION: PLANT ECOLOGY,  
SESSION 1 OF 3; WOODY PLANTS**

Room: 410A

- 1pm-1:15pm.....Mohammed Abdelkreim**  
*Investigation of Change in Vegetation Attributes at EL\_Khauwie District, Western kordofan State, Sudan*
- 1:15pm-1:30pm.....Matt Reeves**  
*Quantifying Encroachment on Rangelands in the Kaibab National Forest*
- 1:30pm-1:45pm..... Samantha Cady**  
*Quantifying and describing woody plant encroachment risk in the Great Plains*
- 1:45pm-2pm.....Dillon Fogarty**  
*Grassland risk and vulnerability to woody encroachment in the Great Plains*
- 2pm-2:15pm.....Pete Bauman**  
*Use of NAIP and LiDAR Imagery to Determine the Rate of Loss of Native Grasslands in Eastern South Dakota from 2012 – 2021.*
- 2:15pm-2:30pm.....Trevor Caughlin**

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*Achieving the promise of landscape demography with drone-based measurements of sagebrush demographic rates*

- 2:30pm-2:45pm.....Ryan Schroeder**  
*Soil seed bank and aboveground vegetation community dynamics across a shrub encroachment gradient in the Northern Chihuahuan Desert, U.S*
- 2:45pm-3pm.....Katie Joe Pennartz**  
*Niche divergence of a drought-deciduous shrub and its implications on range expansion under changing climate scenarios*
- CONTRIBUTED ORAL SESSION: GRAZING, SESSION 2 OF 5;  
TARGETED GRAZING, VIRTUAL FENCING & MORE**  
Room: 410B
- 1:15pm-1:30pm.....Shelemia Nyamuryekung'e**  
*Virtual Fencing of nursing cattle grazing large pastures of Chihuahuan Desert rangelands*
- 1:30pm-1:45pm.....Brett Blum**  
*Applications of Virtual Fence Technology in Quantifying Livestock Resource Selection in a Semi-Arid Ecosystem*
- 1:45pm-2pm.....Alexander Smart**  
*Targeted browsing with goats for eastern redcedar (*Juniperus virginiana*) control*
- 2pm-2:15pm.....Andrew Evans**  
*Targeted grazing in California grasslands increases native annual forbs and reduces fine fuels*
- 2:15pm-2:30pm.....Agustina Rivoir**  
*Effect of herbage allowance and animal genotype on the selectivity for high and low patches of beef cows grazing native subtropical grassland.*
- 2:30pm-2:45pm.....Shiva Torabian**  
*The seasonal effects of residual Ivermectin on nutrient cycling, plant biomass and dung beetle*
- 2:45pm-3pm.....Courtney Buchanan**  
*USING GENETIC SEQUENCING OF FECAL SAMPLES TO UNDERSTAND DIETARY AND MICROBIAL DIFFERENCES IN FERAL HORSES AMONG BLM HERD MANAGEMENT AREAS*

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**CONTRIBUTED ORAL SESSION: AVIAN WILDLIFE ON THE RANGE**

Room: 410C

- 1pm-1:15pm**.....**Peter Coates**  
*Estimating spatiotemporal trends of sage-grouse population abundance within stochastic environments: six decades of declines across the American West*
- 1:15pm-1:30pm**.....**Jeff Beck**  
*Increasing Feral Horses Adversely Affect Greater Sage-Grouse Nest Survival in Central Wyoming*
- 1:30pm-1:45pm**.....**William Richardson**  
*Shifts in Sage-Grouse Arthropod Food Sources Across Grazing and Environmental Gradients in Upland Meadow Communities*
- 1:45pm-2pm**.....**Megan Milligan**  
*Linking resource selection to population performance to identify species' habitat across broad spatial scales: an example of greater sage-grouse in a Distinct Population Segment*
- 2pm-2:15pm**.....**Brian Prochazka**  
*Assessing the efficacy of conservation efforts aimed at improving rangeland conditions for greater sage-grouse within the Bi-State Distinct Population Segment*
- 2:15pm-2:30pm**.....**Seth Dettenmaier**  
*A science-based management of ravens tool (SMaRT): A 3-tiered hierarchical framework*
- 2:30pm-2:45pm**.....**Shawn O'Neil**  
*Dynamic spatial modeling of common raven densities and a decision support tool to manage predation of greater sage-grouse nests*
- 2:45pm-3pm**.....**Sarah Webster**  
*Geothermal energy production impacts a sensitive indicator species within sagebrush ecosystems in western North America*

-- 3:00PM-5:00PM --

- Workshop: (10am-5pm) Invasive Annual Grass Management: From Satellites to Surveys to Spray Decisions (Organizer: Mealor)**  
 Room: 110CD
- 3pm-3:15pm**.....**Jane Mangold, Montana State University**

*Seeding in Areas with Low Recovery Potential*

- 3:15pm-3:30pm**.....**Brian A. Mealor - University of Wyoming**  
**IMAGINE**  
*Getting the most from your annual grass herbicide program*
- 3:30pm-3:45pm**.....**Jaycie Arndt - University of Wyoming**  
**IMAGINE, Northeast Wyoming Invasive Grasses Working Group**  
*Using Monitoring to Inform Adaptive Management*
- 3:45pm-4pm**.....**Greg Becker and Charles Sandford**  
*Idaho's Cheatgrass Challenge*
- 4pm-4:15pm**.....**Julie Kraft, Sublette County (WY) Weed and Pest District**  
*Protecting resilient plant communities with collaborative landscape scale cheatgrass management*
- 4:30pm-5pm**.....**DISCUSSION**

**Symposium: Measuring rangeland management impacts on carbon and ecosystem services: Insights across disciplinary borders (Organizer: Foster)**

Room: 120B

**Description:** Soil organic carbon relates to rangeland productivity, water storage, and potential sequestration for climate change mitigation, yet rarely are these outcomes discussed together. This symposium drills down into the emerging soil data and models, focusing on how soil carbon can serve to indicate rangeland health and potentially mitigate climate change. We will dive into questions about rangeland variability, how management impacts soil carbon, soil sampling strategies, models to capture management impacts, and current knowledge gaps. We invite rangeland managers and researchers across disciplines to discuss existing rangeland data, approaches to monitoring, and how soil carbon relates to other ecosystem outcomes.

- 3:00pm**.....**Jeff Goodwin, Texas A&M University**  
*Monitoring for ecosystem outcomes in grassland systems*
- 3:15pm**.....**Chelsea Carey, Point Blue Conservation Science**  
*How to measure soil carbon and health on rangelands in the face of heterogeneity*

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**3:30pm.....Sheri Spiegall, USDA-ARS Jornada Experimental Range**

*Measuring the effects of management on soil carbon and its bedfellows on ranches of the Americas*

**3:45pm.....Paige Stanley, Colorado State University**

*Prospects for grazing management to AMP up soil carbon on California rangelands*

**4:00pm.....Corey Shake, Point Blue Conservation Science**

*How existing and future rangeland research can connect carbon and conservation*

**4:15pm.....Rebecca Ryals, University of California, Merced**

*Effects of Compost Amendments to Rangelands with Steep Slopes on Soil Carbon, Greenhouse Gas Fluxes, and Nutrient Runoff*

**4:30pm.....Toby Maxwell, Boise State University**

*Challenges and opportunities in measuring the response of rangeland soil carbon to disturbance, invasion, and management: an example from sagebrush steppe*

**4:45pm.....Jennifer Soong, Corteva Agriscience**

*Data collection for emerging carbon markets in managed grasslands*

**Symposium: (Full Day) The emerging urgency of fuel breaks: developing a better understanding of likely impacts on wild-fire, plants, wildlife, and people (Organizer: Strand)**

Room: 120A

**EFFECTS ON PLANT COMMUNITIES AND WILDLIFE**

**3:15pm-3:30pm.....Francis Kilkenny (US Forest Service)**

*"Dynamics of forage kochia spread from fuel-break seedings in the Snake River Plain of Idaho, USA"*

**3:30pm-3:45pm.....Steven Matthews-Sanchez et al. (USGS)**

*"Developing and evaluating fuel break performance metrics across spatiotemporal scales and for multiple risk factors in sagebrush landscapes of the Great Basin"*

**3:45pm-4pm.....Susan McIlroy and Doug Shinneman (USGS)**

*"Fuel break treatment effects on plant communities and fuel loads across diverse fire histories in south central Idaho"*

**4pm-4:15pm..... Julie Heinrichs et al. (CSU)**

*"Assessing the cover, connectivity and future proliferation of invasive fine fuels"*

**4:15pm-4:45pm.....Closing Discussion**

*Closing discussion re: next steps in fuel break science and management (led by E. Strand and D. Shinneman)*

**Workshop: Applying Grazing to Meet Landscape and Vegetation Objectives: Targeted Grazing in the Great Basin and Surrounding Rangelands (Organizer: Anderson)**

Room: 120C

**Description:** This workshop will define targeted grazing and discuss examples of different applications of the practice throughout the Northwestern United States. Emphasis will be given to special projects where monitoring has determined the effectiveness of grazing. We will highlight the importance of graziers monitoring their projects and offer simple techniques practitioners can use.

- Andres Cibils: Overview of Targeted Grazing
- Pat Clark: Grazing firebreaks, multistate experiment
- Kirk Davies: Grazing Cheatgrass to increase perennial expression
- Lance Okeson or Brian Thrift: Targeted Grazing on the Owhyee Front (invited)
- Ray Holes, Prescriptive Livestock Services: Idaho Targeted Grazier (invited)
- James Bogan: Idaho Targeted Grazier (invited)
- Other area graziers for panel discussion TBD

**1pm-5pm.....Symposium: Producer & Young Producer's Symposium: Rangelands Across the World (Organizer: Orozco)—**

**CONTINUED**

Room: 100D

**1pm-5pm.....Workshop: Stakeholder Engagement for the International Year of Rangelands and Pastoralists (IYRP) 2026: Action Planning Workshop for the North American Region (Organizer: Coppock)—CONTINUED**

Room: 100E

**CONTRIBUTED ORAL SESSION: RANGE TECHNOLOGIES, SESSION 1 OF 2; UAVS**

Room: 410C

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- 3pm-3:15pm**.....**Keegan Hammond**  
*Detecting Spatiotemporal Variation of Alfalfa Leaf Area with Drone*
- 3:15pm-3:30pm**.....**Peter Olsoy**  
*Estimating shrub biomass and productivity at the Great Basin LTAR site with an unoccupied aerial system (UAS) time series*
- 3:30pm-3:45pm**.....**Dan Lauritzen**  
*Predicting bulbous bluegrass green-up using weather and soil measurements and remote cameras in eastern Idaho*
- 3:45pm-4pm**.....**Sean Kearney**  
*Prairie dog burrow and colony mapping from unmanned aircraft systems (i.e., drones)*
- 4pm-4:15pm**.....**David Rowley**  
*Mapping Grassland Plant Communities Subjected to Nutrient Influx and Disturbance using UAV Remote Sensing and Machine Learning*
- 4:15pm-4:30pm**.....**Lori Massey**  
*Using UAVs to Quantify Forage Production of a Pastureland*
- 4:30pm-4:45pm**.....**Xavier Jaime**  
*Exploring effective detection of Prickly Pear Cactus (*Opuntia lindheimerii*) from airborne imagery before and after prescribed fires in the Edwards Plateau*
- 4:45pm-5pm**.....**Nick Litizette**  
*Mapping Milkweed for Monarchs*

**CONTRIBUTED ORAL SESSION: PLANT ECOLOGY,  
SESSION 2 OF 3: CLIMATE, WATER & DROUGHT**

Room: 420B

- 3pm-3:15pm**.....**David Toledo**  
*Drought effects on plant species composition and root biomass in a Kentucky bluegrass Invaded northern Great Plains rangeland*
- 3:15pm-3:30pm**.....**Carlos Ochoa**  
*Soil Moisture, Vegetation, and Shallow Groundwater Level Variability in a Rangeland Setting in the Chihuahuan Desert, Northern Mexico*
- 3:30pm-3:45pm**.....**Thomas Merchant**  
*Seasonal dry spell effects on primary production in Colorado grasslands*
- 3:45pm-4pm**.....**Julie Finzel**  
*Long-term Impacts of Drought in the Southern San Joaquin Valley*

- 4pm-4:15pm**.....**Tolibjon Mukimov**  
*CULTIVATION OF FODDER CROPS BASED ON THE USE OF GROUNDWATER IN THE KYZYLKUM DESERT*
- 4:15pm-4:30pm**.....**Federico Villarreal-Guerrero**  
*Chlorophyll fluorescence of fourwing saltbush (*Atriplex canescens*) and blue dalea (*Dalea bicolor*) under climate change scenarios*
- 4:30pm-4:45pm**.....**Rebecca Finger Higgens**  
*Drought diminishes differences among ecological states across a historical grazing gradient*
- 4:45pm-5pm**.....**Fidel Hernandez**  
*Evaluating the Insurance Hypothesis: Biodiversity and Rangeland Productivity in a Variable Environment*

**CONTRIBUTED ORAL SESSION: GRAZING, SESSION 3 OF 5;  
GRAZING SYSTEMS & MANAGEMENT**

Room: 420A

- 3pm-3:15pm**.....**Cameron Shea Bureson**  
*Long-term adaptive management trends on USFS Region 3 grazing allotments*
- 3:15pm-3:30pm**.....**Gregg Simonds**  
*How Proper Grazing Management Can Improve Water Security*
- 3:30pm-3:45pm**.....**Katherine Wollstein**  
*Working with ranchers to improve rangeland wildfire preparedness outreach*
- 3:45pm-4pm**.....**David Augustine**  
*Adaptive, multi-paddock, rotational grazing management alters foraging behavior and spatial grazing distribution of free-ranging cattle*
- 4pm-4:15pm**.....**Sheila Barry**  
*Conserving habitat and species, the role of livestock grazing on California's rangelands*
- 4:15pm-4:30pm**.....**Nicolas Caram**  
*Factors affecting seasonal defoliation patterns by cattle in heterogeneous grassland*
- 4:30pm-4:45pm**.....**Jen Hanson**  
*Plant community response to changes in grazing and precipitation timing in the Shortgrass Steppe*

**CONTRIBUTED ORAL SESSION: RESTORING RANGELANDS,  
SESSION 2 OF 3**

Room: 410A

- 3pm-3:15pm**.....**Elise Gornish**  
*Granivorous ants prefer small and unprotected seeds—implications for restoration in arid rangelands*
- 3:15-3:30pm**.....**Tolibjon Mukimov**  
*RE-INTRODUCTION OF PERENNIAL, DROUGHT-RESISTANT FORAGE PASTURE CROPS IN THE CONDITIONS OF THE FOOTHILL ZONE OF UZBEKISTAN*
- 3:30pm-3:45pm**.....**Pete Bauman**  
*Do cover crops enhance the success of prairie plantings? A cautionary tale from Eastern South Dakota.*
- 3:45pm-4pm**.....**Randi Lupardus**  
*Reclamation following oil and gas development on the Colorado Plateau governed by abiotic setting and time*
- 4pm-4:15pm**.....**Chandan Shilpakar**  
*Vegetation diversity, productivity, and soil dynamics in reclaimed grassland*
- 4:15pm-4:30pm**.....**Molly Reichenborn**  
*Plant community dynamics following herbicide application across a mesquite encroachment gradient*
- 4:30pm-4:45pm**.....**Alexandra Urza**  
*Variation in drought responses and restoration applications for pinyon pine*

**CONTRIBUTED ORAL SESSION: INVASIVES, SESSION 1 OF 2**

Room: 410B

- 3pm-3:15pm**.....**William Austin Rutherford**  
*Trait responses of a grassland shrub invader to altered moisture regimes*
- 3:15pm-3:30pm**.....**John Paul Wasan**  
*Disturbance, Drought and Nutrients: Investigating Absinthe Invasion in Native Grassland in the Canadian Prairies*
- 3:30pm-3:45pm**.....**Devii Rao**  
*Control of Russian thistle (*Salsola* spp.) on California's Central Coast Rangelands*
- 3:45pm-4pm**.....**Jeff Mosley**

*Long-term vegetation dynamics after 2, 4-D treatment to suppress *Wyethia helianthoides* in mountain meadows of central Idaho*

- 4pm-4:15pm**.....**Erik Lehnhoff**  
*Lehmann Lovegrass (*Eragrostis lehmanniana*) Removal Facilitates Black Grama (*Bouteloua eriopoda*) Recovery in the Chihuahuan Desert*
- 4:15pm-4:30pm**.....**Nic McMillan**  
*Scale, biodiversity, and invasion in the tallgrass prairie: a test of the Invasion Paradox across large working rangelands.*
- 4:30pm-4:45pm**.....**Katherine Hovanes**  
*Demographic rates of invasive perennial bunchgrass grass buffelgrass (*Pennisetum ciliare*) vary with topography*
- 4:45pm-5pm**.....**Jaycie Arndt**  
*Evaluating Bulbous Bluegrass Control by Various Herbicides*
- 3pm-6pm**.....**Rangeland Cup**  
Room: Grand Ballroom AB
- 5pm-6pm**.....**Poster Session #1**  
Room: Grand Ballroom AB
- 6pm-8pm**.....**Basque Center Dinner and Entertainment**  
Offsite

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**TUESDAY, FEBRUARY 14TH**

- 7am-8am**.....**2023 Planning Committee**  
Room: 140
- 8am-6:30pm**.....**Trade Show**  
Room: Grand Ballroom AB
- 8am-9am**.....**Plenary**  
Room: 400 Ballroom
- 8am-5pm**.....**Outreach and Recruitment for Agency Jobs**  
Room: 440
- 9am-9:30am**.....**Coffee Break**  
Room: In the Trade Show! Ballroom AB
- 6am-Noon**.....**Plant ID**  
Room: Grove Hotel: Evergreen Ballroom
- 9:30am-5pm**.....**HSYF Paper Presentation**  
Room:120A

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-- 9:30AM-11:30AM --

**Workshop: Data Management – Plans, Storage, and Access  
(A PSA, public service announcement) (Organizer: Kaplan)**

Room: 430A

**Description:** The art and science of rangeland ecology and management is holistic in nature which puts a premium on long-term data, both experimental and experiential. However, maintaining and curating these datasets along with new requirements for developing data management plans creates challenges and makes for a confusing time for researchers and others. The workshop will feature hands on examples of data management plans and storage opportunities, creative small group conversations, an interactive question and answer session, and the opportunity for follow up mentoring with researchers who are familiar with data management and curation.

- Dr. Marquee King (Tentative)—The importance of a data management plan in research
- Drs. Amy Ganguli and/or Dr. James – What does a good data management plan look from a NIFA perspective.
- Nicole Kaplan and Holly Johnson—What is tidy data and why is meta-data considered a love note to your future self?
- Nicole Kaplan and Erin Antognoli—Where do I store my data and what does a DOI get me?
- Whole group—small group discussions on setting up data plans
- Whole group-- One on one discussions about your individual data plan

**Symposium: (Full Day Session) Beyond Meat - Livestock, soil carbon and ecosystem service markets in the U.S. West: generating complementary funding for rangeland and rural community stewardship? (Owen)**

Room: 120C

**Description:** 3-part session; The full day symposium will explore a range of examples and models for natural resource management, conservation and financing that value landscape functionality for both agriculture commodity production and a full suite of ecosystem services derived from rangelands. Within their individual areas of expertise and experience, speakers will respond to the general question of, what are the opportunities for the West of a land-based

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economy in which the return on investment grows over time as the lands and communities from which services are derived are stewarded and restored?

**SYMPOSIUM AGENDA**

Session 1 (9:30 – 11:30) - Meeting the needs of western landscapes and communities with Ecosystem Service Markets. Local knowledge is paramount to stewardship of ecosystems, along with a comprehensive understanding of management strategies for a particular ecotype. However, viability of management strategies requires more than production knowledge and geographic eco-literacy. Models that focus on financial viability, trust and a shared commitment to people and place generate efficiencies, improve stewardship outcomes, and serve landowners and communities. Through responsiveness to questions and ideas that emerge as producers are engaged, partners can engage to further improve our understanding of the capacities of landscapes, the management strategies that build landscape functionality, and the financial mechanisms and policy structures that match supply and demand in ways that benefit rangeland landscapes.

- (10) Bre Owens (Western Landowners Alliance) – overview of the day
- (20) Jared Talley (Boise State University) – Markets, ecosystems, and western communities: what are we talking about?
- (60) Producer Panel and audience Q&A - A facilitated panel discussion with five ranchers to discuss ranch goals and the relationship to carbon and ES markets – Facilitated by Bre Owens
  - Glenn Elzinga (Alderspring Ranch, ID)
  - Mark Pratt (Pratt Family Beef, ID)
  - Bill Milton (Milton Ranch, MT) - tentative
  - Agee Smith (Cottonwood Ranch, NV)
  - Jack Hanson (Willow Creek Ranch, CA) - tentative
- (20) James Rogers (Northway Ranch Services) - Challenges faced by the western ranching community to achieve desired objectives of ES markets

**Symposium: An Appreciation of the Contribution of Dr. Steve Archer to Arid land Ecology and the Management of Rangelands (Organizer: Brown)**

Room: 110AB

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**Description:** Dr. Steve Archer, and his collaborators, have produced a uniquely relevant and insightful body of work linking rigorous experimental investigations to management challenges faced by rangeland managers. Steve, and his students and post-doctoral fellows, have maintained a 4-decade long focus on the ecological processes and mechanisms underlying common arid land management challenges, and on the responses necessary to alleviate undesirable impacts. In this symposium, we will present the body of research within the context of common management challenges and the influence of the work. The presentations will cover shrub increase, invasive species, ecosystem change, ecosystem services and management responses and will conclude with a Q&A.

- The importance of understanding seed dispersal and seedling recruitment in arid grassland:shrubland transitions. (Joel Brown, Austin Rutherford and Nate Pierce)
- Can soil properties mediate nonnative grass invasions in arid rangelands? (Cheryl McIntyre)
- Rethinking grass: shrub Interactions in arid rangelands: management implications. (Dawn Browning and Katherine Predick)
- The effects of shrub:grass conversions on ecosystem functions (Heather Throop)
- Evaluating and managing for Ecosystem Services in arid rangelands (Adam Naito and Steven Jones)
- Discussion, Q&A

**Symposium: Virtual Fence Technology: Challenges and opportunities for implementing virtual fence across public, private, and research sectors. (Organizer: Brennan)**

Room: 110CD

**Description:** Virtual fencing (VF) technology can enable rangeland managers to better manage the timing, duration, and distribution of grazing animals on the landscape, while reducing labor and material costs associated with physical fencing. Recently, several commercial options have become available to livestock producers, and VF projects and partnerships have been initiated across U.S. rangelands. The objective of this symposium is to give a broad overview of virtual fence applications and ongoing projects across different groups, regions, and organizations including 1) university researchers, 2) NGO/Government organizations, and 3) private livestock producers, while discussing challenges associated implementing VF systems.

- 9:30am-9:45am: Dr. Joslyn Beard. University of Arizona. Overview of Virtual Fence Systems
- 9:45am-10am: Dr. Rory O'Connor. USDA-ARS Burns. The potential of virtual fence for managing fine fuels in the sagebrush steppe
- 10am-10:15am: Dr. Jameson Brennan. South Dakota State University. Comparison of Virtual Fence and Continuous Graze systems on Animal Behavior
- 10:15am-10:30am: Dr. Ryan Reuter. University of Oklahoma. Effects of virtual fencing on cortisol concentrations and behavior of beef cattle
- 10:30am-10:45am: Stephanie Pitt. Managing Rangelands with Virtual Fencing for Grazing Lands Conservation in Eagle County, Colorado.
- 10:45am-11am: Anthony Capizzo and William Burnidge. Virtual fences: a win-win for cattle ranching and conservation? A pilot project in the Flint Hills.
- 11am-11:15am: Clay Burtrum. Burtrum Cattle LLC. Producers' perspective on implementing a virtual fence system.
- 11:15am-11:30am: Nick Jorgensen. Jorgensen Land and Cattle. Perspectives from a South Dakota beef cattle operation on virtual fence technology: ups and downs lead to insights and changes.
- 11:30am-11:45am: Dr. Dana Hoag. Colorado State University. Producer views about virtual fencing.
- 11:45am-Noon: Panel Q&A

**Symposium: The Role of Invasive Exotic Plant Species in Reclamation and Restoration (Organizer: Di Stefano)**

Room: 120B

**Description:** Invasive exotic plant species, hereafter referred to as weeds, are a major driver of degradation to rangeland ecosystems throughout the world. In addition to driving degradation, weeds pose a major challenge to re-establishing desired species by altering ecosystem processes and outcompeting desired species for limited resources. As such, weeds are a major issue for restoration of rangeland systems. This half day symposium will bring together cutting-edge research on the restoration of rangeland systems degraded by weeds.

Mae Elsinger (AGR-GC, Great Plains) – confirmed: Managing Kentucky bluegrass infestation of native species plantings  
Amy Gill (CSU, Great Plains) – confirmed: Native seed mix functional diversity increases competition with invasive annual grass Bromus

tectorum

- Chad Kluender, Matt Germino (US Geological Service, Boise) – Breaking the cheatgrass-fire cycle with co-produced, adaptive management: importance of a whole-community perspective, grazing, and biocrusts.
- Charlie Clement/Daniel Harmon (USDA-ARS, Great Basin) – confirmed: Restoring cheatgrass invaded systems of NV sagebrush steppe
- Josh Davy (UC Extension – Tehama County, California Annual Grassland) – confirmed: A synopsis of multiple approaches to weed control and restoration in California Annual Rangelands
- Theresa Becchetti (UC ANR- Modesto, California Annual Grassland) – confirmed: Restoration at the Pasture Scale: Using Grazing and Planting Strategies to Control Medusahead Infested Pastures.

**Symposium: Strategies and Tools for Prioritizing Management Actions in Sagebrush Ecosystems**  
(Organizer: Crist)

Room: 100D

**Description:** The sagebrush biome is undergoing major ecological transformations due to a variety of perturbations. New policies and funding provide increased opportunities for conserving and restoring these rangelands. Strategies developed for prioritizing management to maximize benefits include the “Sagebrush Conservation Strategy” and “Science Framework for Conservation and Restoration.” New geospatial information on core sagebrush habitat as well as current and projected future ecological resilience and invasion resistance advance these strategies. We discuss the importance of the new funding and policies, integration of the existing strategies, and role of the new geospatial layers in prioritizing management in these important ecosystems.

- Policies, Funding and Prioritization – where are the agencies headed (Karen Kelleher (BLM ID State Director) and Mary Farnsworth (FS R4 Regional Forester))
- Linking efforts to conserve and restore sagebrush ecosystems (Tom Remington (WAFWA) and Michele Crist (BLM))
- Defining core sagebrush habitat (Kevin Doherty (FWS) and team)
- New indices of resilience to disturbance and resistance to invasion based on climate and soil water availability (Jeanne Chambers (USFS RMRS) and team)
- Projected changes in R&R and fire risk in a warming environment – implications for current management (John Bradford and Daniel Schlaepfer (USGS))
- Discussion: Integration – next steps

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**CONTRIBUTED ORAL SESSION: RANGELAND TECHNOLOGIES, SESSION 2 OF 2; CAMERAS AND REMOTE SENSING**

Room: 410A

- 9:30am-9:45am.....**Anne Blackwood**  
*Remote Sensing for Wildlife*
- 9:45am-10am.....**Taylor Bayne**  
*SMART WILDLIFE MONITORING: EVALUATING CAMERA TRAPS ENABLED WITH ARTIFICIAL INTELLIGENCE*
- 10am-10:15am.....**Biquan Zhao**  
*Linking on-ground plant functional group biomass production to remote sensing in the semi-arid grasslands of the Nebraska Sandhills*
- 10:15am-10:30am.....**Cara Applestein**  
*Considerations when using remote sensing fractional cover products for land management purposes*
- 10:30am-10:45am.....**Matthew Rigge**  
*Rangeland Condition Monitoring Assessment and Projection (RCMAP): Tracking Fractional Rangeland Component Cover Over a 36-year Time-series*
- 10:45am-11am.....**Pete Bauman**  
*Innovative use of NAIP and LiDAR Imagery to Identify Potentially 'Undisturbed' Land in South Dakota and the Great Plains: Implications for Retention of Native Grasslands.*
- 11am-11:15am.....**Wayne Smith**  
*Exploring Spatial and Dimensional Differences Across Multiple Resolutions in Image Classification*
- 1:15am-11:30am.....**Lucas Phipps**  
*Assessing vegetative state utilizing remotely sensed fractional cover and vegetation inventory data*

**CONTRIBUTED ORAL SESSION: RESTORING RANGELANDS, SESSION 3 OF 3**

Room: 410B

- 9:30am-9:45am.....**Michelle Jeffries**  
*Accessible Adaptive Management: An Introduction to the Land Treatment Exploration Tool*
- 9:45am-10am.....**Corey Gucker**  
*Biology, Ecology, and Use of Forbs in Restoration*

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- 10am-10:15am**.....**Alan Alvarez**  
*Selecting grass species for grasslands restoration through environmental niche modeling*
- 10:15am-10:30am**.....**Akasha Faist**  
*Biocrust and nutrient additions increase vascular plant biomass of perennial rangeland grass Arizona Cottontop (*Digitaria californica*)*
- 10:30am-10:45am**.....**Kyle Cook**  
*Effects of seed coatings on emergence and survival of winterfat*
- 10:45am-11am**.....**Amy Symstad**  
*Prescribed fire and targeted herbicides may not be enough to restore invaded northern mixed-grass prairie*
- 11am-11:15am**.....**Curtis Drake**  
*Targeted Grazing to Reduce Cheatgrass Abundance*
- CONTRIBUTED ORAL SESSION: GRAZING, SESSION 4 OF 5; CASE STUDIES FROM AROUND THE WORLD**  
Room: 410C
- 9:30am-9:45am**.....**Wendimu Bireda**  
*Multivariate analysis to Distinguish Indigenous Cattle in North Shewa zone of Oromia, Ethiopia*
- 9:45am-10am**.....**Mesay Guyo**  
*Physiological features reactivity of Arsi-Bale goats reared under the three agro-ecologies of the Bale zone, southeastern Ethiopia*
- 10am-10:15am**.....**Brien Norton**  
*Rotational grazing success in Central Asia*
- 10:15am-10:30am**.....**Matthew McIntosh**  
*Assessing grazing behavior of heritage, hybrid, and conventional cattle breeds in response to climate change*
- 10:30am-10:45am**.....**Javier Arturo Ñaupari Vasquez**  
*Response of Degraded Rangelands to the Exclusion of Cattle Grazing within the Huascanan National Park, Ancash-Peru*
- 10:45am-11am**.....**Caroline Wade**  
*Assessing the impact of water and forage resources on sheep and goat distribution in Queensland, Australia – a case study*
- 11am-11:15am**.....**Erach Mamedov**  
*Cultivation of Fodder Crops Based on the Use of Groundwater in the Kyzylkum Desert*

- 11:15am-11:30am**.....**Tolibjon Mukimov**  
*The Use of Effective Technologies in Animal Husbandry in Uzbekistan*
- 1pm-5pm**.....**CPRM Exam**  
Room: 430A
- 1pm-5pm**.....**JFSP Fire Risk Working Group**  
Room: 430B
- 1:30am-1pm**.....**SRM Business Meeting Lunch**  
Room: Junior Ballroom
- 2pm-4pm Tour**.....**Basque Center Walking Tour**  
Offsite

-- 1:00 PM-3:00 PM --

**Workshop: Putting the R in Rangelands: Data Management and Visualization Using Tidyverse in R (Organizer: Harrison)**

Room: 100D

**Description:** This workshop will introduce participants to R statistical software for rangeland specific data. Using packages within the tidyverse, we will clean, manipulate, summarize, and visualize data. During the workshop, example code and datasets will be provided and explained and then practice datasets will be provided for participants to get hands-on experience with the material. This workshop's intended audience is students, early career professionals, and anyone interested in learning more about using R's tidyverse to manage data and create visualizations. If possible, participants should bring a laptop with R Studio (free) installed.

- Georgia Harrison (University of Idaho)
- Leah Dreesmann (University of Idaho)
- Claire Tortorelli (UC Davis)

**Symposium: (Full Day) Beyond Meat - Livestock, soil carbon and ecosystem service markets in the U.S. West: generating complementary funding for rangeland and rural community stewardship? (Organizer: Owen)**

Room: 120C

**Session 2 (1:00 – 3:00) - The nuts and bolts of rangeland Ecosystem Service Markets**

Interest in carbon markets across the US is exploding. Despite this,

it can be difficult for managers and ranchers to know if they will benefit from participation, and how to get involved. This session's goal is to demystify developing markets. Speakers in this session will discuss, credit development, market nuts and bolts, economic viability, and provide insight on how to launch projects, along with address the widespread doubt that semi-arid rangelands can sequester meaningful amounts of SOC. Additional discussion will look beyond just the single ecosystem service of carbon, and consider market-based mechanisms that value suites of rangeland ecosystem services generated by whole and healthy landscapes.

- (1:00) Developing protocols and markets for ecosystem services
- (20) TBD - A history of ecosystem service markets and new approaches: Multiple pathways for generating and selling "credits" from ranch to marketplace
- (20) Regen Network (invited) – CarbonPlus Grasslands: An ecosystem services marketplace methodology for carbon and co-benefits in grasslands
- (20) Hallie Mahowald (Western Landowners Alliance) – Habitat leasing: A market-based mechanism for stewardship of working-wild landscapes
- (2:00) Economics and science of ecosystem services
- (20) Amber Bieg (Warm Springs Consulting) – An economic model of the costs and benefits for grazing lands carbon market participants
- (20) Taylor Payne (Utah Grazing Improvement Program) – Livestock grazing and stewardship: Economic relevance to a northern Utah community
- (20) Megan Nasto (Working Lands Conservation) – The effects of livestock grazing on soil health and organic carbon in semi-arid rangelands: A case study from northern Utah

**Ignite: Science for adaptive management of burned rangelands: Insights for breaking the cheatgrass-fire from the 2015 Soda Megafire (Organizer: Germino)**

Room: 100E

**Description:** The annual-grass and wildfire cycle continues to spread and cause loss of perennials and ecosystem services across vast areas, in spite of decades of management action and research. A significant aspect of the problem is that the areas burned are vast, remote, and more heterogeneous than is appreciated, which creates uncertainty on plant and soil factors that affect or define recovery

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and management treatment success. To overcome these issues, a coordinated management and science response to the 2015 Soda Megafire near Boise produced a rich set of well-documented and replicated management treatments that was followed with the most intensive scientific assessment of a burned area to date. The burned area has become the best-well studied, globally, and there are many ongoing projects and opportunities. This ignite session will highlight the major findings and their relevance to other burned areas, and will be linked to a poster session in which details of each study can be discussed.

**Identifying and overcoming data needs for post-fire management**

- Germino M, Torma P, with commentary from BLM officers: Introduction and overview – variability and the challenges it poses to managing burned rangelands. Historical context, importance, triggers, and key treatments of the Soda wildfire management response.
- Price, J: Reconstructing the Soda Wildfire using fire simulation models: importance of heterogeneity in the pyroscapes.
- Fisk, M: Methods for rapid field sampling of a large megafire area to inform rapid management response.
- Applestein C: How well can we know post-fire vegetation recovery? - Field data, sample sizes, modeling, and remote sensing considerations.
- Germino M: Soil stability: Passive sensors reveal otherwise undetected post-fire soil erosion patterns.
- Kluender, C: Overcoming bias in determining post-fire treatment effectiveness: new statistical tests provide insights on combining herbicide and seeding.

**Plant community recovery and restoration effects**

- Applestein C: Biotic diversity and biotic interactions within and among exotic annual grasses reveal more complexity than is recognized in current literature and management.
- Fisk, M: Does native plant diversity matter for resistance to annual grasses? 1500 points and 5-year of inference.
- Germino M: Hotspots for sagebrush seeding effectiveness vary over time since fire and development of restored vegetation
- Davidson B: Sagebrush planting effectiveness reveals importance of soil mapping and co-treatments.

**Protection and wildlife use of the investment**

- Price, J: Fuel breaks: Protecting the restoration investment, but what are their effects?

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- Anthony, C: Assessing post-fire livestock impacts below the scale we have spatial information on cows for: can we model selective use of pastures?
- Davidson, B: Experiments to estimate the elusive effects of livestock grazing resumption after fire.
- Pilliod, D: Pollinator responses to vegetation recovery.
- Anthony, C: Do sage grouse benefit from post-fire restoration treatments? The answer depends on data type and potential problems with spatial autocorrelation.

**Symposium: Poisonous Plants Across Rangelands  
(Organizer: Stonecipher)**

Room: 420A

**Description:** Poisonous plants are found throughout rangelands in the western U.S. and the World. They grow within natural and disturbed landscapes consisting of diverse plant communities such as sagebrush steppe, desert shrub, short grass prairies, foothills and mountain rangelands. Poisonous plants cause large economic losses through reduced animal weight gains, reproduction losses, lost grazing opportunities, and animal death. Understanding some of the plants that poison animals on rangelands and how such plants affect animals is beneficial to producers to best understand how to graze such rangelands and reduce animal losses.

- 1pm-1:15pm: Geographical and seasonal variation in larkspur alkaloids – Clint Stonecipher, Poisonous Plant Research Lab
- 1:15pm-1:30pm: What happens when an animal consumes more than one toxic plant? Kevin Welch, Poisonous Plant Research Lab
- 1:30pm-2pm: Noninvasive specimens to diagnose livestock exposure to toxic plants. Stephen Lee, Poisonous Plant Research Lab
- 2pm-2:15pm: DNA metabarcoding as a diagnostic tool for poisonous plant research. Daniel Cook, Poisonous Plant Research Lab
- 2:15pm-2:30pm: Sheep grazing for control of Geyer's larkspur (*Delphinium geyeri*). Derek Scasta, University of Wyoming
- 2:30pm-2:45pm: Limiting the risks of selenium toxicosis when managing livestock on seleniferous rangelands. Zane Davis, Poisonous Plant Research Lab
- 2:45pm-3pm: Can clays bind plant toxins in the rumen? Ben Green, Poisonous Plant Research Lab

**Symposium: (1pm-5pm) Cultivating future rangeland**

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**professionals and rangeland-literate public – An integrated cross-boundary approach of the Prairie Project  
(Organizer: Wu)**

Room: 110AB

**Description:** Woody plant encroachment poses grave threats to sustainability of rangelands globally. Pyric herbivory and mixed-species grazing are management strategies that can help control woody plants, support livestock production, and promote biodiversity. Their adoption by rangeland managers and support in the policy arena have been limited because of cultural constraints and public misperceptions. We present an integrated cross-boundary education and outreach effort, as a key component of the USDA-funded Prairie Project, that develops agents of change and education and Extension resources, cultivates progressive rangeland professionals and rangeland-literate public, and supports broader adaptations of these management strategies and rangeland sustainability.

- Chase Brooke, Texas AgriLife Extension Service, "Burn it, graze it, teach it, use it: Building effective extension programming to demonstrate best range management practices with landowners"
- Laura Goodman, Oklahoma State University, "Bridging the divide between research and management: A new approach for extension programming"
- Humberto Perotto, Texas A&M University-Kingsville, "Using drone imagery in the classroom to compare vegetation changes after a prescribed fire"
- Erika Sullivan, Texas AgriLife Extension Service, "Learning about woody brush encroachment outside the classroom through the Prairie Project"
- Evan P. Tanner, Texas A&M University-Kingsville, "Utilizing thermal landscapes as an impetus towards integrating climate science into patch-burn management education in undergraduate curriculum"
- Allison Thompson, Oklahoma State University, "Social media - What works for extension?"
- Morgan Treadwell, Texas AgriLife Extension Service, "Rangeland literacy: Learning from the rancher on the ranch"
- Ben Wu, Texas A&M University, "Developing agents of change and innovations in K-16 education to promote rangeland literacy"
- Bryan Yockers, Jenks High School (Jenks, OK), "Fire Ecology Research Station for Teaching (JenksFERST): Opportunities for science communication"

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**Workshop: (1pm-5pm) SRM Leadership Initiative  
(Organizer: Roath)**

Room: 120B

**Description:** Assisting the next generation of land managers with skills in collaboration and innovation is essential to building healthy rangelands, maintain the rangeland profession, and strengthen the Society for Range Management. The goal of the Leadership Initiative Task Force is to explore opportunities for early-career rangeland professionals to build networks of resources and advocates that will create a culture of open communication, innovation, and problem solving for rangeland management.

**Workshop: (1pm-5pm) Mesic Area Restoration: Assessment, Implementation, and Monitoring (Organizer: Winford)**

Room: 110CD

**Description:** Mesic areas (including riparian zones and meadows) provide a host of services and benefits to humans and wildlife and the restoration of these areas on public and private lands is a focus of many programs and funding sources. This workshop will bring together several aspects of the restoration process and provide attendees an overview of how to strategically plan and carryout a restoration project. The workshop will cover the following topics: stream assessment in order to identify key threats, implementation framework including permitting and consideration of specific techniques, and monitoring approaches to determine if objectives are met.

- Chad Boyd (ARS)/ Dustin Johnson (OSU) "Assessing threats to streams"
- Josh White (USFWS) "A framework for implementing process-based restoration"
- Caroline Nash (CK Blueshift)/ Eric Winford (UI) "Process-based monitoring"

**CONTRIBUTED ORAL SESSION: GRAZING,  
SESSION 5 OF 5, DIETS & MORE**

Room: 410A

**1pm-1:15pm.....Keith Harmony**  
*Vegetation and Animal Production in Pastures Sprayed for Western Ragweed Control*

**1:15pm-1:30pm.....Laura Snell**  
*Livestock Mortality Composting in California*

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**1:30pm-1:45pm.....Cory Oltjen**  
*Effects of temperature and lunar illumination on cattle activity and distance traveled from water at night by Corriente cattle*

**1:45pm-2pm.....Robin Malik**  
*The effect of diet diversity on goat meat quality*

**2pm-2:15pm.....Anna Dagel**  
*Precision Supplementation Effects on Heifer Development and Reproduction*

**2:15pm-2:30pm.....John Walker**  
*Dietary Preference Nature or Nurture?*

**2:30pm-2:45pm.....Logan Vandermark**  
*Comparing Net Energy for Activity Between Continuous and Virtual Grazing Systems Using GPS Data and Daily Weights*

**2:45pm-3pm.....Carmen Willmore**  
*Forage Intake and Digesta Kinetics of Beef Cattle Differing in Feed efficiency While Grazing Idaho Rangelands*

**CONTRIBUTED ORAL SESSION: PLANT ECOLOGY,  
SESSION 3 OF 3; ANIMAL INTERACTIONS & MORE**

Room: 410B

**1pm-1:15pm.....Andy Kleinhesselink**  
*Long-term trends in vegetation on Bureau of Land Management rangelands in the western U.S.*

**1:15pm-1:30pm.....Lindsey Buehler**  
*Evaluating Ungulate Usage of Rangelands with Black-tailed Prairie Dog Disturbance*

**1:30pm-1:45pm.....Lauren Porensky**  
*Ecosystem resilience to prairie dog disturbance offers opportunities for rangeland management*

**1:45pm-2pm.....Stephanie Yelenik**  
*Disturbance and plant community assembly in exotic-dominated landscapes*

**2pm-2:15pm.....Martín Do Carmo Corujo**  
*Improving herbage mass prediction by regression tree analysis*

**2:15pm-2:30pm.....Sergio Arispe**  
*Predicting Litter Biomass in Degraded Sagebrush Rangelands of the Northern Great Basin*

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**2:30pm-2:45pm.....Brandi Wheeler**  
*Leveraging erosion models with established land health assessments to support management decisions*

**2:45pm-3pm.....Lea Condon**  
*Intact Habitat for Greater Sage-Grouse Includes Biological Soil Crusts*

**--3:00 PM-5:00 PM--**

**Symposium: Utilizing current statistical methods for proper ecological inference and applications to management (Organizer: Applestein)**

Room: 100D

**Description:** For decades, ecological data analysis has been conducted using statistical methods developed for laboratory or crop science. These analyses do not adequately account for the real-world variability inherent to ecological data. As a result, findings are often unclear, contradictory, or don't predict real world outcomes. Several recent reviews and papers have shown that the choice of statistical analysis can have significant and severe impacts on ecological inference, sometimes obscuring true effects or inaccurately displaying effects that don't exist. We will explore how to improve our inference using cutting-edge statistical methods to better understand variable management outcomes.

- Allison Simler-Williamson - Quantifying treatment effects in light of the non-random application of restoration efforts: a case study in burned sagebrush steppe
- Thomas Rodhouse - Statistical survey designs, models, and management: Bridging the gap for practitioners in sagebrush steppe
- Katherine Banner - Use it or lose it! Considerations for using informative priors in Bayesian models to address ecological questions of interest
- Kathryn Irvine - Why everyone should be using the beta distribution for assessing temporal and spatial variation in plant cover
- Andrii Zaiats - LDA to aid understanding patterns of biodiversity and identification of plant communities and states
- 20 minutes panel discussion at the end

**Symposium: (9:30am-5pm) Beyond Meat - Livestock, soil carbon and ecosystem service markets in the U.S. West: generating complementary funding for rangeland and rural**

**community stewardship? (Organizer: Owen)**

Room: 120C

Session 3 (3:00 – 5:00) – People and livestock at work in rejuvenating western landscapes

- (3:00) Suites of services and case studies of regenerative grazing
- (20) Lynn Huntsinger (University of California, Berkeley) – Managing for and valuing ecosystem services beyond carbon
- (20) Kris Hulvey (Working Lands Conservation) – How do we manage for stacked ecosystem services in semi-arid rangelands? Examples from the Three Creeks grazing project
- (20) Caryl Elzinga (Alderspring Ranch) – A Range of Benefits: Reinventing Herding in the 21st Century
- (4:00) Necessary next steps
- (20) Producer Panel – Additional thoughts and takeaways
- (40) Audience engaged discussion - Facilitated by Bre Owens, Kris Hulvey and Jared Talley

**Ignite: Applications of gap intercept monitoring methods to understand rangeland ecological dynamics (Organizer: McCord)**

Room: 100E

**Description:** Gap intercept is a widely used monitoring method, included as core method in the BLM AIM and the NRCS NRI programs as well as local research and monitoring projects. Land managers have many valid questions about using canopy gap information to inform decision-making and improve understanding of ecological dynamics. This is in part due to lack of consensus on ecological interpretations of gap intercept as well as variability in implementation of the gap intercept method. Canopy gap with all vegetation, perennials-only canopy gap, and basal gap are the dominant implementations of this method. In this session, we present the use and application of different gap intercept datasets to understand post-fire treatment success, fuels treatment success, wind and water erosion dynamics, invasive species spread, and wildlife habitat condition. We will conclude the session with a discussion to synthesize the appropriate use of gap intercept data and to identify remaining gaps in the application and use of gap intercept data.

- Sarah/Emily/Aleta— The gap intercept method: history and remaining questions
- Matt Germino- Gap intercept in post-fire monitoring: Application to

sagebrush steppe rangelands under threat of the invasive grass-fire cycle.

- Nick Webb— Using gap intercept data to assess wind erosion risk and land management effects on air quality
- Jason Williams— Gap intercept in water erosion modelling
- Beth Newingham – Exploring opportunities to use gap intercept data in fuels management
- David Pilliod— Gap intercept applications for assessments of wildlife habitat, predation risk, and fearscape
- Madelon Case—Gap intercept and invasive species dynamics
- Leah Dreesmann— Mind the gap: an overview of potential errors and their implications in gap intercept data
- Anthony Schaefer – Linking canopy gap intercept to biocrust cover and composition

**Symposium: Wolf-Livestock Conflict Management on U.S. Forest Service Lands (Organizer: Charnley)**

Room: 420A

**Description:** This symposium highlights how conflict associated with wolf presence and livestock grazing on Forest Service-managed lands in the western U.S. is being addressed and managed. Federal lands pose particular challenges for managing wolf-livestock conflict owing to the large size, remote nature, and rough terrain of many grazing allotments; a multiple use management context; and state versus federal responsibilities for managing wolves versus livestock grazing, respectively. We focus on the successes and challenges in implementing coexistence approaches on Forest Service lands, and factors that influence their outcomes.

- Dr. Jeff Martin, U.S. Forest Service, Pacific Northwest Research Station Fellow: “Setting the Stage: Wolves, Livestock, and Conflict over their Management on Forest Service Lands”
- Dr. Nick Bergmann, University of Idaho “The Emotional Political Ecologies of Managing Wolf-Livestock Conflict in the Pacific Northwest”
- Jan Bowey, US Forest Service, Beaverhead-Deerlodge National Forest: “Livestock/Wolf Depredation Prevention Measures on the Beaverhead-Deerlodge National Forest”
- Dr. Robert Anderson, US Forest Service, Pacific Northwest Research Station Fellow: “Large, rugged, and remote: applying tools and techniques for wolf-livestock coexistence on US Forest Service lands”
- Brandon Weinmann, U.S. Forest Service, Colville National Forest: “Find-

ing success with wolves and livestock on public land: insights from the Colville National Forest”

- Dr. Alex Few, Western Landowners Association: “Innovation of policies and practices to address carnivore conflicts on federal lands”

**Symposium: (1pm-5pm) Cultivating future rangeland professionals and rangeland-literate public – An integrated cross-boundary approach of the Prairie Project (Organizer: Wu)–CONTINUED**

Room: 110AB

**Workshop: (1pm-5pm) SRM Leadership Initiative (Organizer: Roath)–CONTINUED**

Room: 120B

**Workshop: International Rangeland Congress, Australia 2025: An opportunity to stimulate US-Australia rangelands collaboration (Organizer: Ash)**

Room: 420B

**Description:** Australia is hosting the XII International Rangeland Congress in June 2025. This will be the first in-person International Rangeland Congress in nearly a decade and it provides a good platform to stimulate US-Australia rangelands collaboration. To make the most of this opportunity, discussion and networking needs to start now. This session will provide a brief overview of planning arrangements for the IRC followed by a presentation on key issues, challenges and opportunities in US and Australian rangelands. A moderated discussion will explore areas of mutual interest for collaboration as well as seeking broader ideas and input to the IRC program.

**Workshop: (1pm-5pm) Mesic Area Restoration: Assessment, Implementation, and Monitoring (Organizer: Winford)–CONTINUED**

Room: 110CD

**Description:** Mesic areas (including riparian zones and meadows) provide a host of services and benefits to humans and wildlife and the restoration of these areas on public and private lands is a focus of many programs and funding sources. This workshop will bring together several aspects of the restoration process and provide

attendees an overview of how to strategically plan and carry out a restoration project. The workshop will cover the following topics: stream assessment in order to identify key threats, implementation framework including permitting and consideration of specific techniques, and monitoring approaches to determine if objectives are met.

- Chad Boyd (ARS)/ Dustin Johnson (OSU) "Assessing threats to streams"
- Josh White (USFWS) "A framework for implementing process-based restoration"
- Caroline Nash (CK Blueshift)/ Eric Winford (UI) "Process-based monitoring"

**CONTRIBUTED ORAL SESSION: CARBON ON THE RANGE**

Room: 410B

**3:15pm-3:30pm.....Seton Bachle**  
*Belowground storage in grassland systems: the impact of seasonal fires on non-structural carbohydrate reserves in native forbs*

**3:30pm-3:45pm.....Zg Chen**  
*Effects of extreme rainfall events and different functional types on the net ecosystem exchange, biomass and nitrogen mineralization in a Northern Great Plains mixed grassland*

**3:45pm-4pm.....Travis Brammer**  
*Arriving at a natural solution: Bundling credits to access rangeland carbon credits*

**4pm-4:15pm.....Landon Schofield**  
*Acute Effects of Fire on Soil Carbon*

**4:15pm-4:30pm.....Eric Sant**  
*Mapping Percent Soil Carbon and its Change in the Riparian Areas of the Humboldt Ranch*

**4:30pm-4:45pm.....Mike Anderson**  
*Upland soil carbon pools: sampling, mitigating costs, and defining carbon distributions across large landscapes.*

**CONTRIBUTED ORAL SESSION: EXOTIC ANNUAL GRASSES, SESSION 1 OF 2**

Room: 410

**3pm-3:15pm.....Lisa Rew**  
*Evaluating integrated control practices for cheatgrass at high elevation*

*sagebrush sites*

**3:15pm-3:30pm.....Brynne Lazarus**  
*Critical questions for pre-emergent herbicides in sagebrush steppe: longevity of target and non-target effects on species and ecosystem properties*

**3:30pm-3:45pm.....Maddy Case**  
*Exotic annual grass invasion and grazing across Northern Great Basin rangelands: a cross-scale perspective*

**3:45pm-4pm.....Ranae Zauner**  
*Effects of imazapic and drought on plant communities in intact Mojave Desert ecosystems*

**4pm-4:15pm.....Beth Fowers**  
*Effects of Indaziflam Application Timing on Annual Grass Control at Seven Rangeland Sites*

**4:15pm-4:30pm.....Jake Courkamp**  
*Long-term cheatgrass (Bromus tectorum L.) control with indaziflam in sagebrush-grasslands in Sublette County, Wyoming: research synthesis and future directions*

**4:30pm-4:45pm.....Joe Smith**  
*Invasive annual grasses and fire in the Great Basin: New insights from remote sensing*

**4:45pm-5pm.....Stephen Boyte**  
*Bi-weekly early estimates of exotic annual grass abundance in rangelands of the western U.S.*

**5pm-6pm.....Diversity and Inclusion Committee Meeting**  
 Room: 120B

**5pm-6:30pm.....Poster Session #2**  
 Room: Grand Ballroom AB

**5:00PM-6:00PM.....Univ. of Alberta & Univ. of Saskatchewan Student Team Social**  
 Room: 410C

**5:30PM-6:30PM.....Idaho Social**  
 Room: 120A

**5:30PM-7:30PM.....University of Arizona Social and Friends**  
 Room: 120B

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5:30PM-7:30PM.....Utah State University Social  
Room: 120C

5:30PM-7:30PM.....Colorado State University Social  
Room: 410A

5:30PM-7:30PM.....University of Wyoming Social  
Room: 410B

6:00PM-7:00PM.....ARS Family Meeting  
Room: 100D

6:00PM-7:30PM.....Bridging the Gap  
Room: 430

6:30pm-8:00pm.....USFS Family Meeting  
Room: 110AB

6:30pm-8:00pm.....NRCS Family Meeting  
Room: 110 CD

6:30pm-8:00pm.....BLM Family Meeting  
Room: 100E

8pm-11pm.....Dance  
Room: Junior Ballroom

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**WEDNESDAY, FEBRUARY 15TH**

7am-8am.....2023 Planning Committee  
Room: 140

6:30am-7:30am .....Fun Run

8am-9am.....Plenary  
Room: 400 Ballroom

8am-5pm.....Outreach and Recruitment for Agency Jobs  
Room: 440

9am-9:30am.....Break

9:30am-1pm.....TOUR: World Center Birds of Prey  
Offsite

9:30-11:30am.....SRM Partner Meeting  
Room: 430A

10am-Noon.....NRCS Vegetation Monitoring and Data Interpretation Capstone Presentations  
Room: 120A

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**-- 9:30AM-11:30AM --**

**Symposium: Beyond Direct Seeding: The Next Frontier of Landscape Scale Vegetation Restoration. Rangeland Technology and Equipment Council (RTEC). (Organizer: Gunnell)**  
Room: 420A

**Description:** This symposium will focus on efforts to implement the use of alternative plant materials (e.g. outplanting, transplanting, etc.) as a revegetation method within shrubland communities in the intermountain region. The discussion will outline current research and management efforts, as well as infrastructure and equipment limitations in expanding practice's to landscape scales. This symposium will be followed with a companion campfire discussion "Beyond Direct Seeding: Overcoming Limitations in Equipment and Infrastructure of Alternative Plant Materials" to further discuss how to overcome limitations in scale and capacity of revegetation efforts.

- Introduction (Kevin Gunnell, 1-3 min), Steve Monsen Memoriam (Mike Pellant, 5 min), Revegetation Equipment Catalog Update (Corey Gucker, 7-9 min)
- Jeremiah Pinto, Rocky Mountain Research Station, USDA Forest Service, "Considerations for growing target rangeland plant materials in nurseries"
- Kari Veblen, Dept. of Wildland Resources and Ecology Center, Utah State University, "Establishment of mountain big sagebrush from mature plant vs. seedling transplants"
- Kirk Davies, Eastern Oregon Agricultural Research Center, USDA-ARS Burns, "Microsite location and cattle grazing effects on sagebrush transplants"
- Matthew Madsen, Dept. of Plant and Wildlife Sciences, Brigham Young University, "Use of Waterboxx® devices for establishing trees and shrubs on mineland overburden hillslopes"
- Andrew Nelson, Dept of forest, Rangeland and Fire Sciences, University of Idaho, "Drought conditioning seedlings to improve outplanting performance; Perspectives from tree seedlings and applications to rangeland plants"
- Matthew Germino, Forest & Rangeland Ecosystem Science Center, U.S. Geological Survey, "Relative importance of management and natural factors affecting post-fire sagebrush plantings and their implications for restoring megafires"
- Scott Jensen, Rocky Mountain Research Station, USDA Forest Service, "Designing a target plant and automated wildland transplanter for plant-based sagebrush restoration"

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**Workshop: What you really need to know about the Carbon Market with Good Grazing Makes Cent\$ (Organizer: Birrenkott)**

Room: 100D

**Description:** With increased trading of carbon credits in the Ecosystem Marketplace, ranchers throughout the countryside are questioning the risks and rewards associated with entering a carbon credit contract. We'll explore carbon markets from all angles that a rancher needs to know in this interactive discussion- From the ecological perspective in terms of soil/land health, the economic perspective and its potential impact on an operation's bottom line, the law perspective regarding contractual agreements, the management perspective and grazing implications, and an overarching view of the impact this could have on the future of ranching. Participants will also have a chance to ask questions directly of experts, ranchers who have participated in a market, and market aggregators. Come with questions and ready for real talk.

**Panel 1 - Experts**

- Jeff Goodwin, Program Director, Texas A&M Natural Resources Institute
- Peter Donovan, Soils Consultant Confirmed pending registration
- Scott Warner, attorney and land broker
- Conni French, Montana Rancher
- Dale Veseth, Montana Rancher
- Greg Simonds

**Panel 2 - Aggregators**

- Chris Mehus, Western Sustainability Exchange
- Colin Mitchell, Native's NGP Grazing Carbon Program Manager
- Brekke Munks, Agoro Carbon Alliance

**Symposium: Understanding the effects of fuel treatments in sagebrush ecosystems (Organizer: Chambers)**

Room: 120B

**Description:** In recent decades more area burned in shrubland and grassland (56%) than tree-dominated ecosystems (44%) with particularly severe impacts in the sagebrush biome. Increases in wildfire extent and severity have resulted in policies to increase capacity to prevent and suppress fires and funding to implement fuel treatments. To address critical information gaps, we synthesize information on long-term effects of common fuel treatments in the sage-

brush biome on fuel and fire behavior and on ecological resilience and resistance to invasion. We discuss the economic trade-offs of the treatments and describe new spatial data and tools for prioritizing fuel treatments.

- Altered fire regimes and ecosystem transitions: Is the knowledge keeping up with the policies and funding? (Michele Crist, BLM; Ben Newburn, USDA Forest Service, R4)
- Durability of common fuel treatments in sagebrush ecosystems (Lisa Ellsworth, OSU; Eva Strand, U of I; Matt Reeves, RMRS; Karen Short, RMRS)
- Ecological effects of common fuel treatments in sagebrush ecosystems (Eva Strand, U of I; Jeanne Chambers, RMRS; Lisa Ellsworth, OSU; Claire Tortorelli, UC Davis; Ali Urza, RMRS)
- Modeling economic tradeoffs of fuel treatments using state and transition models (Tom Bridges-Lyman, Mike Tayler, Katie Lacey, UNR)
- Mapping nonforest fuels in the past, present and future (Matt Reeves, RMRS; Karen Short, RMRS)
- New data layers to aid prioritization of treatment areas: resilience and resistance, core sagebrush areas, fire probability and cover of invasive annuals (Jeanne Chambers, RMRS; Jessi Brown, RMRS)

**Symposium: Rangeland Stewardship Council (RSC): Towards rangelands sustainability certification and verification (Organizer: Baival)**

Room: 120C

**Description:** Despite the environmental, social and economic importance of rangelands there is no common or agreed standard for effective and efficient rangeland management that could serve as the basis for sustainability certification of rangeland livestock products.

There is increasing stakeholder pressure to better manage the way we graze and raise livestock and the impact of extensive livestock husbandry on the environment and biodiversity. The effective management of rangelands through a credible standard will positively affect many supply chains such as meat, dairy, leather, mohair, cashmere, and other animal fibres. The symposium will be devoted to discussing the concept of rangeland sustainability certification, how it works, the perspectives of different sectors (conservation, industry, producers, etc.) and experiences of existing certification

schemes, and presenting and discussions potential Global Principles for Rangeland Stewardship.

Section 1 the Case for Rangeland Sustainability Certification: Perspectives from Producers, Industry, and Conservation Organizations. The first session provides a broad overview of and presents the case for a unified certification approach via a global Rangeland Stewardship Council, followed by shorter presentations from the perspectives of conservation, producer groups, industry and organizations involved in certification efforts.

- Overview of the Sustainability Certification for Rangelands: The Case for a Rangeland Stewardship Council (15 min) Batkhishig Baival, Sustainable Fibre Alliance
- Conservation Perspectives on Rangeland Sustainability Certification (12 min) - Nancy Labbe, TNC
- Indigenous producer perspectives from Argentina/South Africa (3 min x 2 recorded video) Alpaca Association/Mohair South Africa
- Industry perspectives from leather/meat (12 min) - Peter Hughes, Head of Sustainability Business development, Eurofins, BLC Leather Technology Centre Limited
- Sustainability certification scheme (12 min) ISEAL - David D'Hollander, Manager Policy and Innovations International Social Environmental Accreditation and Labelling Alliance
- Indigenous producer perspectives from Mongolia/Australia (3 min x 2 recorded video) Alpaca Association/Mohair South Africa
- Supply chain sustainability (12 min) - Una Jones, CEO, Sustainable Fibre Alliance - Confirmed
- Global principles for Rangeland Stewardship Standard, (15 min) – Daniele Gelz, Land Restoration and Private Sector team, UNCCD
- Moderated Discussion (30 min)

Global principles for rangeland stewardship: towards a global standard, accountability, and feasibility. Presentations that address accountability and feasibility. To ensure balanced talks, representatives from different sustainability schemes will share their experiences with different commodities.

**Workshop: (9:30am-3pm) Planning and management under new wildfire realities using a fireshed-scale approach (Organizer: Wollstein)**

Room: 110CD

**Description:** Invasive annual grasses and frequent large wildfires

on Oregon rangelands present challenges of such complexity they necessitate working across multiple jurisdictions. Managing for rangeland resilience now requires individuals and organizations to strategically coordinate rangeland and fire management activities so they translate to a scale that matters. This workshop introduces an integrated rangeland and fire management approach using Potential Operational Delineations (PODs). Participants will apply these principles using multiple data inputs to consider: 1) spatial scale for effective coordination, 2) entities to engage, 3) planning and management tools, and 4) decision-support tools and technologies for short- and long-term planning.

Speakers: Dustin Johnson (OSU), Vanessa Schroeder (OSU), Katie Wollstein (OSU), Casey O'Connor (Burns Interagency Fire Zone/US Fish and Wildlife Service), Megan Creutzburg (Sage Grouse Conservation Partnership), Chad Boyd (ARS), Josh Hanson (High Desert Partnership)

The workshop will be designed to encourage dialogue between participants and organizers with opportunities for questions, discussion, co-creation, and networking. The length of the workshop is estimated to be four hours, with the session organized as follows:

- Workshop goals and integrated fire management overview (20 minutes)
- New wildfire realities on Oregon rangelands: rangeland management is (or should be) fire management (20 minutes)
- region's Geographic Strategy to spatially organize and prioritize efforts to defend the core, grow the core, and mitigate impacts (20 minutes)
- Break (10 minutes)
- PODs: A useful tool for coordinating activities before, during, and after fire. Participants will explore applications beyond Oregon in other fire-prone rangeland contexts.
- Stinkingwaters Case Study (35 minutes): Applying an integrating rangeland and fire management approach using PODs.
- Introduction to Landscape Planning Tools (15 minutes)
- Break (10 minutes)
- Practice applying an integrated range and fire management approach to rangeland contexts beyond Oregon
- Breakout Group Activity: Applying integrated rangeland and fire management to the area surrounding the Cinder Butte Fire



- Group report out and discussion
- Wrap up discussion: Translating to on the ground management

**Workshop: Solutions for the Rangeland Workforce Crisis (GS 0454) – Moving Forward (Organizer: Edinger)**

Room: 100E

**Description:** The rangeland workforce is in crisis. Many Rangeland Management Specialists (GS-0454) positions face limited applicants or go unfilled. To address this situation some positions are being generalized to the General Natural Resources Management series (GS-0401) for more abundant applicants without specific rangeland management qualifications. We need solutions to increase the number of qualified people entering the rangeland management profession to ensure effective conservation and management of rangelands. This workshop will focus on solutions and concrete actions to address this crisis. Over the last decade, SRM has hosted several workshops and ongoing discussions. This year we will continue with this work by engaging intelligent, motivated, albeit frustrated range professionals into four working groups to develop and propose actions to address concerns and draft solutions. Team will work on the following topics to build a rejuvenating and vibrant workforce: 1) How to track and annually report the status of the rangeland profession, 2) Build effective youth and recruiting programs, 3) Emphasize public relations and branding to increase awareness of the rangeland profession, and 4) Rethinking curriculum to provide rangeland knowledge and skills. Come one and come all to participate, or just to listen and learn. Leaders/participants for each working group will have started addressing their charges in late 2022 and we will continue discussions and draft specific plans. Some steps may require additional resources, some we can accomplish for free as sheer forces of nature. Join us!

**Workshop: Scaling ecological management frameworks in a changing world. (Organizer: Naumann)**

Room: 110AB

**Description:** Ecological management frameworks, such as ecological sites, provide important context and defensibility for land managers. Understanding implications and risks of various decision options can help weigh various objectives (e.g. fuels reduction, carbon sequestration, forage production) in the face of different drivers (e.g. climate

change, increased fire frequency, changing land uses). However, these decisions occur at various spatial and temporal scales that require flexibility. This symposium explores approaches and ideas for diversifying these frameworks at different scales (e.g. ecological site groups).

- B. Bestelmeyer and Jeb Williamson. A tool for guided state and transition model development based on ecological theory.
- T.W. Nauman, J. Johanson, J.A Thompson. State and transition models in a time of change: toolsets for carbon management.
- J. Johanson, T.W. Nauman, Defining and developing ecological site groups to meet diverse user needs.
- M.C. Duniway, Knight, A, T.W. Nauman, Capturing ecosystem dynamics at regional scales using ecological site groups, state-and-transition models, and monitoring data.
- S. Salley, B. Bestelmeyer, J. Pittenger, D. Rachal, C. Talbot, Nesting ecological sites within a generalized ecological management unit
- J. Brown, Using Generalized State and Transition Models for Conservation Planning and Assessment.
- Heller, A. A Generalized State Approach to Setting Reclamation Benchmarks.

**CONTRIBUTED ORAL SESSION: SOCIAL SCIENCE OF THE RANGE, SESSION 1 OF 2**

Room: 410B

- 9:30am-9:45am.....Kelly Hopping**  
*Who approves of livestock grazing? An assessment of Idahoans' changing views on rangeland issues*
- 9:45am-10am.....Ada Smith**  
*Institutional interactions: How government programs and public land grazing permits influence adaptation on U.S. working rangelands*
- 10am-10:15am.....Kaylee Littlefield**  
*Collaborating Across Borders for Rangeland Benefits*
- 10:30am-10:45am.....Lauren Hunt**  
*Climate change beliefs, decision-making and adaptation behaviors of Western US ranchers*
- 10:45am-11am.....Krista Ehlert**  
*beefSD: Exposure to a holistic view of the beef cattle industry helps beginning producers increase operation sustainability over time*
- 11am-11:15am.....Fadzayi Mashiri**

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*Rangeland Conversion Drivers and Impacts of Post-Conversion Management Strategies on Landscape Level Ecosystem Health*

**11:15am-11:30am.....Gwendwr Meredith**  
*Great Plains fire cultures: Opportunities to align science, policy, and management*

**CONTRIBUTED ORAL SESSION: FIRE, SESSION 2**

Room: 410A

**9:30am-9:45am.....OPEN**

**10am-10:15am.....John Hendrickson**  
*Impact of fire and drought on axillary bud numbers in Kentucky bluegrass (*Poa pratensis* L.)*

**10:15am-10:30am:.....Jim Ansley**  
*Prescribed Fire and Invasive Woody Sprouters: Are We Trapped in a Fire Trap?*

**10:30am-10:45am.....Amy Symstad**  
*Prescribed fire and targeted herbicides may not be enough to restore invaded northern mixed-grass prairie*

**10:45am-11am.....Abbigail Rodgers**  
*Grazing intensity and fire frequency effects on plant species and community characteristics in tallgrass prairie*

**11:am-11:15am.....Georgia Harrison**  
*Cheatgrass increases flammability of native perennial grasses in laboratory-based combustion experiments*

**11:15am-11:30am.....Sophia Heston**  
*Exploring the status of historical greenstrip seedings containing forage kochia (*Bassia prostrata*) in northern Nevada*

**1PM-3PM.....CAMPFIRE SESSIONS**

**Campfire: Beyond Direct Seeding: Overcoming Limitations in Equipment and Infrastructure of Alternative Plant Materials. Rangeland Technology and Equipment Council (RTEC) (Organizer: Gunnell)**  
Room: Junior Ballroom

**Description:** This campfire session will be done as a follow-up to the Rangeland Technology and Equipment Council (RTEC) symposium "Beyond Direct Seeding: The Next Frontier of Landscape Scale Vegetation Restoration" on the use of alternative plant materials

(e.g., nursery stock, wildlings, etc.) for wildland revegetation efforts. This will be a guided discussion on how to overcome equipment and infrastructure limitations of using these alternative materials. We hope to have a vigorous conversation with diverse stakeholders on how to develop the equipment, science, industry, and networks to increase the capacity and success of revegetation efforts within the intermountain region and beyond.

**Campfire: Ecological Calendars: Exploring a Climate Adaptation Tool (Organizer: Macon)**

Room: Junior Ballroom

**Description:** Increasingly, climate-related challenges, such as wildfire, drought, and the spread of invasive species, are driving significant disruptions in rangeland and pastoral livestock production systems globally. Shifts in growing and dormant seasons, loss of forage resources, and other factors require producers to adapt production systems, which can have downstream impacts on market access, production value, and livestock species and breed selection, among others. This Campfire session will explore the use of ecological calendars – cyclical calendars based on localized climatological and biological observations, as well as socioeconomic and cultural influences – as a tool for helping producers understand and adapt to these challenges.

**Campfire: Breaking down borders to enhance knowledge and improve management of invasive perennial grasses (Organizer: Hendrickson)**

Room: Junior Ballroom

**Description:** Perennial grasses have invaded rangelands in the Great Plains and decreased plant and wildlife diversity. This campfire will discuss 1) what perennial invasive grasses are in your region, 2) how do landowners view these grasses and have perceptions changed, 3) what strategies are land managers using for control and management of invasive grasses, 4) what are the current research gaps and 5) how can research be coordinated to fill research gaps to identify and meet land manager needs? The last question is the most difficult because it requires the dissolution of institutional borders and increased trust among participants.

**Campfire: Art and Science: Grazing Management Princi-**

**ples for the 21st Century (Organizer: Jablonski)**

Room: Junior Ballroom

**Description:** Livestock grazing management in extensive range-lands is an enormously complex endeavor. Unfortunately, this complexity has led to a lack of clear guidance from the range profession about key principles for the application and evaluation of grazing. Responding to a request from JBS USA, we have convened an ongoing conversation in the profession aimed at distilling outcome-oriented, evidence-based grazing management principles. This effort is led by prominent range scientists from across the Western US and integrates survey responses from experts of all stripes. Join us in this campfire conversation to learn about the results of this work and provide input.

**Campfire: “What’s Missing? Ensuring Early Career Range Professionals Succeed”**

Room: Junior Ballroom

**Description:** This is intended as a discussion to help identify the knowledge, skills, and leadership traits that early career range professionals need to not only succeed but excel in their careers. The discussion will be led by members of the SRM Leadership Task Force and will inform their efforts to develop a focused continuing education program that will fill in gaps and provide support and encouragement to the future leaders of SRM.

**9:30am-3pm.....Workshop: Planning and management under new wildfire realities using a fireshed-scale approach (Organizer: Wollstein)–CONTINUED**

Room: 100AB

**Workshop: Rangeland Educational Resources iROAM (Organizer: Hulet)**

Room: 110AB

Presenters: Gretchen Hyde, Idaho Rangeland Resources Commission and April Hulet, Associate Professor Brigham Young University  
Idaho is a place of rich ecological diversity including forests, cultivated agricultural lands, urban areas, and rangeland. Rangeland is the largest natural resource in Idaho, comprising about 53% of the land cover, and has a legacy of multiple use that has affected where and how people live, work, and recreate. Idaho families have long built their lives on rangeland and act as land stewards to cultivate economic, social, and cultural values for generations to come. Despite

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these efforts, ranchers across the west struggle finding suitable successors to maintain and work on their ranches, preserve local knowledge, and care for the lands that support fish and fauna. Additionally, students seeking range degrees is steadily declining despite the high demand for professionals who can manage rangeland.

Knowing these trends, we can ask ourselves, how can we raise young people’s awareness of the opportunities and challenges on rangeland? Moreover, how can we increase young people’s awareness of the goods and services provided by rangeland including livestock forage, wildlife habitat, outdoor recreation, renewable energy, and open spaces?

To address these questions, the Idaho Rangeland Resources Commission creates youth education programs and materials designed to increase the public’s understanding of rangeland ecology, and the goods and services provided by rangeland. One example is the I-ROAM Rangeland Curriculum which provides lessons and activities for K-12 students that can be used for outdoor schools and classroom lessons. To further enhance educational opportunities for youth, the Idaho Rangeland Resources Commission and its partners built the I-ROAM Traveling Educational Trailer which focuses on teaching 5-8th grade students about rangeland ecology and management throughout Idaho. The educational trailer compliments the curriculum and can be easily integrated when teaching the various sections of the curriculum. Research shows that this age is the critical time to influence student’s career trajectory, especially when experiential learning occurs. Thus, the educational trailer has interactive, hands-on learning activities inside, and is fully wrapped with an artful design on the outside that serves to raise awareness and understanding of the ecological and social implications of proper rangeland management.

This workshop will introduce the I-ROAM curriculum and provide hands-on trainings that can easily be adapted to your specific rangelands. Activities will include:

- Rangeland Stewardship, Can You Have It All?
- Uses and Values of Rangeland
- Skills Challenge: Plant Identification
- Build Your Own Watershed
- Rangeland Toolbox Activity

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Participants will leave the workshop with materials and ideas that will promote rangeland education to youth and adults. These activities can be used for outdoor schools, such as range camps, or for classroom learning.

**Workshop: Identifying and Prioritizing Science to Inform Adaptive Management in the Sagebrush Ecosystem: Updating the Actionable Science Plan (Organizer: Weichman)**

Room: 110AB

**Description:** This session will provide an overview of the previous Actionable Science Plan (2016), a quantitative evaluation of recent progress towards meeting originally identified science needs, and a framework for creating a revised plan. Opportunities for attendees to provide input into important topics as well as the planning process will be provided. The current structure addresses five Priority Science Needs: Fire, Invasive species, Restoration, Sagebrush and Sage-Grouse, and Climate and Weather. The timeline for engagement of widespread and diverse stakeholders across the sagebrush biome will be presented, including opportunities to review identified needs and priorities, identify knowledge gaps and other needs, and help guide research and development that affects many conservation partners.

The existing Integrated Rangeland Fire Management Strategy Actionable Science Plan identified knowledge gaps limiting implementation of effective strategies to meet management challenges in the Sagebrush Biome. Sage-grouse conservation, habitat conditions, management experience and scientific knowledge have changed since that time and demand for well-informed applications remains. Recent collaborative work led by USGS began the effort by identifying additions to the knowledge base. Additional information is needed to complete the current evaluation and planning process. The goal of this effort is identifying actionable science, and we consider topics actionable when/where: (1) the scientific community is able to take immediate actions to fill the information gap(s); (2) results could directly inform actions and decisions to protect, conserve, or restore the sagebrush ecosystem; and (3) actions facilitate funding and implementation of research. Across the board, the topics, research, and applications described must be effectively communicated to the management community.

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Given this structure, this session offers an opportunity for peers across the rangeland management and research community to understand and contribute to development of research priorities. USGS and BLM will continue to work with partners who participated in the development of the first Actionable Science Plan throughout this process, and this meeting offers an open opportunity for new or renewed participation for anyone interested in contributing to this update.

**CONTRIBUTED ORAL SESSION: SOCIAL SCIENCE OF THE RANGE, SESSION 2 OF 2**

Room: 410B

- 1pm-1:15pm.....Anna Clare Monlezun**  
*Traversing the Social & Ecological Dimensions of Collaborative Rangeland Management Through Ecosystem Services Valuation*
- 1:30pm-1:45pm.....Courtney Buchanan**  
*International Year of Rangelands and Pastoralists: Amplifying local voices through film*
- 1:45pm-2pm.....Elizabeth Bennett**  
*The Impact of High Net Worth Individuals on Communities and Rangeland Management in Southwest Montana*
- 2pm-2:15pm.....Elena Graciela Dosamantes**  
*In The Weeds: A Review and Synthesis Invasive Species Governance*
- 2:15pm-2:30pm.....Aaron Lien**  
*Mind the Gap: Citizen Preferences and Motivations for Invasive Plant Management*
- 2:30pm-2:45pm.....Ken Erickson**  
*Let's Go Brandin': An Ethnographic Look at Family, Community, and Ranching Practices in New Mexico's High-Low Country*
- 2:45pm-3pm.....Haley Netherton-Morrison**  
*A values typology to support decision-making in working landscapes undergoing change*

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**CONTRIBUTED ORAL SESSION: EXOTIC ANNUAL GRASSES, SESSION 2 OF 2**

Room: 410A

- 1pm-1:15pm.....Brandon Palmer**  
*An Innovative Approach to Controlling Medusahead at a Management Scale*

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- 1:15pm-1:30pm.....Adam Clifford**  
*Post-Fire Recovery and Cheatgrass Resistance of Perennial Grasses used for Restoration*
- 1:30pm-1:45pm.....Esben Kjaer**  
*Assessing the Drivers and Impacts of Invasive Cool-Season Grasses on Rangeland Plant Communities*
- 1:45pm-2pm.....Jaycie Arndt**  
*Assessing Adaptive Invasive Annual Grass Management via Landscape-scale Vegetation Monitoring*
- 2pm-2:15pm.....Kristina Young**  
*Understanding practitioner weed management practices and needs in Arizona and Utah*
- 2:15pm-2:30pm.....Marshall Hart**  
*The Effects of Ventenata Removal on Rangelands of Northeast Wyoming*
- 2:30pm-2:45pm.....Marshall Hart**  
*The Economics of Ventenata Control in Northeast Wyoming*
- 2:45pm-3pm.....Marshall Hart**  
*Does annual grass invasion affect rangeland drought resistance?*
- 3pm-6pm.....SRM Honor and Student Awards**  
Room: 400 Ballroom
- 4pm-6pm.....SageSTEP**  
Room: 410B

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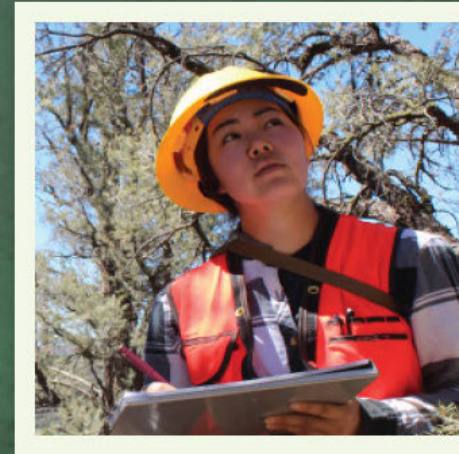


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