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Fall 2020
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Nebraska Grazing Conference Review

by Daren Redfearn, Chair, Nebraska Grazing Conference Steering Committee / Associate Professor, Agronomy and Horticulture Department, University of Nebraska-Lincoln

The 20th Nebraska Grazing Conference is in the books. The NGC Steering Committee had no idea what to expect when it made the decision to change the conference from a face-to-face format to a virtual format due to COVID-19 restrictions. The NGC Steering Committee had no experience in developing and delivering a virtual conference, and it was uncertain about the audience's interest in attending a conference remotely. However, nearly 200 people registered and attended the conference, which is consistent with attendance numbers for past NGCs. Additionally, 90% of those responding to the post-conference survey liked the virtual format. The most common reason for liking the virtual format was the flexibility to view the presentations of interest, whereas the primary reason for not liking the virtual format was the lack of networking and social engagement. As expected, there were a couple of Internet connection issues that are always a problem when going virtual, but my observations are, for the most part, that this was another successful Nebraska Grazing Conference.

Margo McKendree and Liz Husmann, staff within the Center for Grassland Studies, did a remarkable job of coordinating the details and managing the organizers, moderators, and speakers. So, thank you Margo and Liz and thank you to those who offered support and encouragement for us to continue hosting this year's NGC.

As a convenience for those unable to attend the webinar, all presentations were recorded and uploaded to the Center for Grassland Studies' website, <https://grassland.unl.edu/ngc-virtual>. Additionally, 10-15-minute podcast episodes were developed on several of the NGC speakers highlighting some of the information they covered in the full presentation. The podcast episodes may also be accessed at the link above.

The Conference has continued to reach new audiences, all with interests in managing grazing lands. This year, there were 15 first-time attendees with eight attending their second or third Nebraska Grazing Conference. For the third year in a row, we saw a continued shift in the age and gender demographics of conference attendees. The age range of those attending this year's conference was 22 to 84 years of age with an equal number of females (48%) and males (52%). The age range of attendees demonstrates the generational importance of the Nebraska Grazing Conference program topics.

We are hopeful that life will soon return to normal. Next year, we will return to the Younes Conference Center in Kearney, NE. So, please mark August 9, 10, and 11 on your calendar for the 2021 Nebraska Grazing Conference.

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Director's Column by Walt Schacht, Interim Director, Center for Grassland Studies

In the Center's July newsletter, I provided an overview of the Center's primary activities in mid-summer. The focus was on listening sessions, further development of the Center's website, podcasts associated with the Nebraska Grazing Conference (NGC) and the Fall Seminar Series (FSS), and expansion of our prairie/grassland management program at Nine-Mile Prairie, Dalbey Prairie, and the Barta Brothers Ranch. Since then:

- ❖ A virtual NGC was held in August. The successful event included nearly 200 online participants and speakers from across the country (see Page 1 for more).
- ❖ The 2020 Fall Seminar Series includes scientists and professionals from universities, local and federal agencies, and non-profits speaking on prairie and grassland restoration and management and new technology for monitoring and managing grasslands. Sam Fuhlendorf is the Distinguished Leu Lecturer for this year's series. The weekly presentations, which are offered in-person and livestream, are attended by students and professionals throughout the United States.
- ❖ A grassland podcast series was developed and uploaded to the Center's website. The 23 episodes have proven to be popular with nearly 400 hits. The podcast series expands our outreach and serves as a resource for information on grasslands and provides previews of presentations for the NGC and FSS. A second podcast series, "Launch!," focuses on the PGA Golf Management program by showcasing current students, alumni, and industry partners.
- ❖ Four listening sessions were conducted with stakeholders and partners across the state identifying major grassland issues to address in the future (see Page 4 for more).
- ❖ The PGA Golf Management program created a new course, Golf Course Design and Management, in collaboration with Landscapes Unlimited.
- ❖ The Center, along with its affiliates, has collaborated with the Center for Resilience in Working Agricultural Landscapes and/or the Nebraska Integrated Beef Systems Initiative in submitting grant proposals to fund collaborative adaptive management research at the Barta Brothers Ranch and graduate education in IANR.
- ❖ Students in the PGA Golf Management and Grassland Systems degree programs returned to campus in August. Although experiential learning opportunities for students have been limited by COVID-19, student clubs have been active and some student internships have been realized.

The fall/winter period also promises to be a productive time for the Center. We look forward to our stakeholders (including students) and partners becoming increasingly involved in our programs.

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Screening for Rangeland Transitions

by Dan Uden, Assistant Professor, School of Natural Resources, University of Nebraska-Lincoln

Rangeland transitions have consequences, including impacts on forage production, wildfire frequency and intensity, and grassland habitat availability. Undesirable transitions are easier and more cost-effective to manage early on—before they become widespread. It is best to prevent them from even occurring in the first place but anticipating change is challenging.

In the medical field, screening is used for early detection of undesirable change, prior to the onset of disease signs or symptoms. Screening provides early warning of a potential problem, but diagnostic testing is required to confirm the problem's presence and treatment is used to address it. In other words, screening, diagnostic testing, and treatment are most effective when used together.

To enable earlier detection of rangeland transitions, my lab is working with UNL colleagues (**Dirac Twidwell, Mitch Stephenson, Craig Allen,** and others) to develop approaches and metrics for ecological transition screening. Transition screening brings together state-of-the-art theory, data, and technology to detect and track rangeland transitions of national importance over time, including the conversion of native shrubland to annual grassland, the conversion of perennial grassland to woodland, and the conversion of perennial grassland to bare ground. We are also working to connect transition screening with diagnostic testing (inventory, monitoring, expert knowledge) and treatment (management) in rangeland-dominated landscapes throughout the western United States.

By screening for transitions at multiple scales (pastures, ecoregions, and biomes) over time, we can identify transition signals that are persistent (as opposed to transient) and moving (as opposed to stationary) at different scales of observation. The most concerning signals are those that are persistent and moving (spreading) over time. Results can provide early warning of transitions for locations that have not yet experienced their symptoms, but which are likely to in the future due to the changes in surrounding landscapes. When linked with local expert knowledge and monitoring, transition screening can contribute to early and preventative transition management focused on enhancing the resilience of rangeland systems.

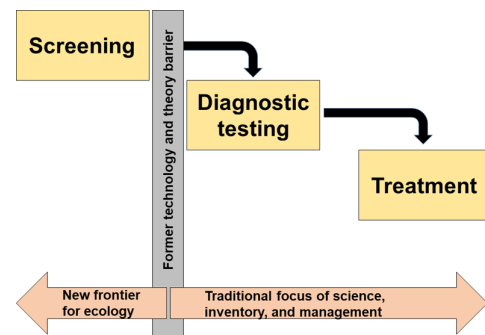
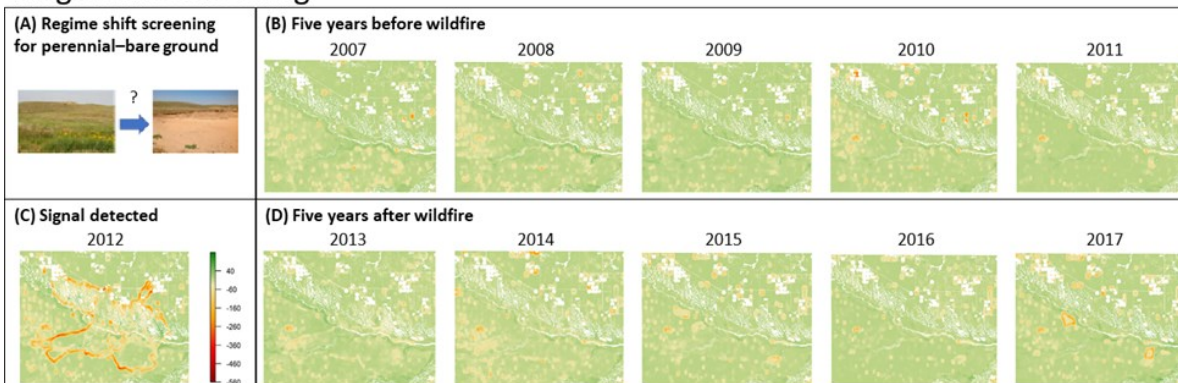


Figure 1: Screening provides early warning of rangeland transitions and works in tandem with diagnostic testing (local expert knowledge, monitoring) and treatment (management) to build resilience in rangeland systems (Uden et al. 2019).

Large-scale screening



Localized screening

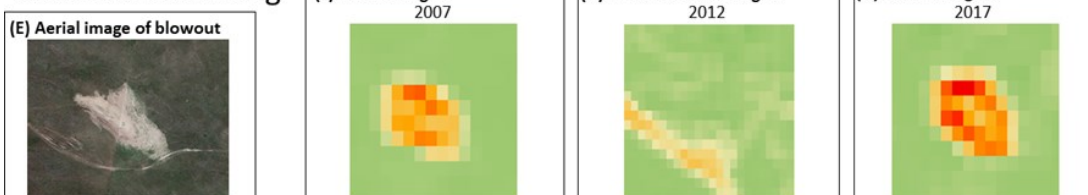


Figure 2: Screening for transition signals between perennial grassland and bare ground in the Nebraska Sandhills at the scales of a 2012 wildfire (A–D) and an individual blowout (E–H).

References: Uden, D.R., D. Twidwell, C.R. Allen, M.O. Jones, D.E. Naugle, J.D. Maestas, and B.W. Allred. 2019. Spatial imaging and screening for regime shifts. *Frontiers in Ecology and Evolution* 7:407.

Grassland Listening Sessions by Walt Schacht, Interim Director, Center for Grassland Studies

Communication is a critical component of the Center's mission in strengthening linkages and developing partnerships with our stakeholders. To build on communication efforts, the Center, in collaboration with the Center for Resilience in Working Agricultural Landscapes (CRAWL) and the Nebraska Integrated Beef Systems Initiative (NIBSI), held four virtual listening sessions across Nebraska with representatives from the ranching community, state and federal agencies, Natural Resource Districts, non-government conservation organizations, and others. The sessions were facilitated by Nebraska Extension in four Engagement Zones: Panhandle (Zone 1), Sandhills (Zones 2 and 3), northeastern Nebraska (Zone 5), and central/south central Nebraska (Zones 6, 7, and 10).

The sessions were highly interactive with participants providing excellent insight into grassland issues. The two primary questions asked of the participants were:

- ❖ What are the major issues that will affect the health, productivity, and uses of grasslands in the next decade?, and
- ❖ What are the gaps (which issues are not being addressed)?

Table 1. Major issues discussed by participants and stakeholder groups identifying with the issues from each engagement zone.

Major Issues	Stakeholder Groups	Engagement Zones ¹
Extremes in weather	Ranchers	All
Invasive plant species	All	Sandhills, NE, and C/SC
Tools for control of invasives	All	Sandhills, NE, and C/SC
Prescribed burning	Agencies and NGOs	Sandhills, NE, and C/SC
Planning (estate and grassland management)	All	All
Markets/marketing	Ranchers	Panhandle and NE
Conservation incentive programs	All	All
Multiple enterprise types/non-market value	Agencies and NGOs	Panhandle and NE
Monitoring soil health and carbon sequestration	All	Panhandle, NE, and C/SC
Public recognition of the importance of grasslands	All	NE and C/SC

¹ Engagement Zones: Panhandle = Zone 1, Sandhills = Zones 2 and 3, NE = Zone 5 in northeastern Nebraska, and C/SC = Zones 6, 7, and 10 central and southcentral Nebraska.

Extremes in weather (especially precipitation) have been a common characteristic of grassland regions in the last decade and indicate that variability in both inter-annual and intra-annual precipitation will continue. The lack of stability in livestock markets is also a concern for ranchers, as is the need for strategies for planning and managing to ensure consistent and sustained forage and livestock production in the future. Land managers and advisors appeared to be looking at government-funded incentive and support programs, diversified livestock markets, carbon credit markets, and development of other enterprises (e.g., fee hunting) as methods of creating stability in revenue streams on grasslands. Invasive plant species (e.g., eastern redcedar and leafy spurge) are also impacting economic and ecological dynamics and managing them is becoming an increasing challenge. Prescribed burning was identified as a management tool for controlling invasive species, however, information on other tools (e.g., herbicides and grazing) is needed. Participants also viewed the future of grasslands as highly dependent on the public's perception of the economic and ecological significance of grasslands, government policies related to management and regulation of private and public grasslands, transition of land ownership from one generation to the next, and absentee ownership.

The major issues identified by our stakeholders are already being used in selecting topics to be addressed in the Nebraska Grazing Conference and the Fall Grassland Seminar Series, guiding development of objectives of proposed research at UNL's Barta Brothers Ranch and other locations, and delivering relevant information through the Center's website. Additionally, the outcomes help identify the basis for collaborative programs between the Center, CRAWL, and NIBSI. The Center also will continue to work with our Citizen Advisory Council to be certain our programs are relevant to an audience of grassland users, managers, and enthusiasts.

Cow Milk Production Influence on Behavioral and Grazing Factors Affecting Calf Performance

by Selby Boerman, Masters Student, Animal Science,
University of Nebraska Lincoln

Cow-calf producers must adapt to match changing forage availability and increasing production costs while sustaining a high-quality product to meet consumer beef demand. With forage resources fluctuating from year to year on semi-arid rangelands, it is important to select high-performing, efficient animals that match environmental variables on rangelands. Selection for cattle growth and milk production traits has steadily increased over recent decades and it is beneficial to examine how these genetic selections influence cow-calf production and grazing behavior. Grazing behavior can influence how cattle utilize a pasture, a concept that is significant to understand from a management standpoint because healthy rangelands are a key component for success in the beef industry as well as for supporting vibrant ecosystems.

Research led by Cow-Calf Production Specialist **Travis Mulliniks** and Rangeland Management Specialist **Mitch Stephenson** at the University of Nebraska-Lincoln Gudmundsen Sandhills Laboratory is utilizing technology to quantify how differences in individual milk production of a cow influence grazing behavior and relationships between cows and calves. Beginning in 2020, GPS collars were fitted to high- and low- milk producing cows and their calves to track grazing distribution and calf-dam proximity. These GPS collars record location points at 1-second time intervals yielding accurate, nearly continuous tracking.

To provide insight into calf nursing behavior, accelerometers that measure head movements were mounted to the calves' collars. These devices measure the number of head movements up and down and side to side which allows for assessment of when and how long calves are nursing. Preliminary data is very promising with high accuracy for recording nursing, grazing, and resting behaviors via accelerometer and GPS tracking. This technology is a valuable tool that allows researchers to better understand drivers of cow-calf behavior and relate this data to producers and rangeland managers.

Understanding diet selection is another significant component in managing livestock on rangelands. Preferences for particular species can spatially and temporally influence plant communities. Therefore, in addition to evaluating *when* and *where* cow-calf pairs are grazing, researchers are also quantifying *what* they are consuming. Individual fecal samples were collected from cows and calves throughout the study.

These samples will be analyzed using fecal DNA sequencing (fDNA) which matches plant DNA in the feces to known plant species. Utilizing this newer technology, as well as other techniques, can provide an accurate assessment of diet composition and help us understand differences between cow and calf diets.



Cow and calf with GPS collars and accelerometer. Photo by Natalie Jones

This project will provide unique insight toward answering questions such as the relationship between milking ability and respective grazing behavior. By building a better foundation of understanding surrounding grazing behavior and diet selection, producers will have an improved basis for cattle selection in regard to milk production level.

The Arthur W. Sampson Fellowship Fund, University of Nebraska-Lincoln, provided partial support for this research.



Selby is an Animal Science masters student advised by Dr. Travis Mulliniks and Dr. Mitch Stephenson. Her research on the influence of milk production on cow-calf grazing behavior, productivity, and profitability takes place at UNL's Gudmundsen Sandhills Lab. She is originally from northern California where her passion for beef production began while working for a commercial cow-calf operation. Selby obtained

her bachelor's degree in Animal Science with a minor in Rangeland Resources from Cal Poly, San Luis Obispo.

PGA Golf Management “Launches” a New Podcast by Liz Husmann,

Center for Grassland Studies

The PGA Golf Management University Program is designed for individuals who love golf and want to translate that passion into a career in the golf industry. From the business and hospitality aspects of the profession, to turfgrass and landscape management, students learn about every facet of the game they love. The University of Nebraska–Lincoln is home to one of only 18 accredited institutions that offer a degree in PGA Golf Management. **Brad Goetsch**, PGA, saw an opportunity to explore and promote this program in a way that hadn’t been done before—by creating the first PGA Golf Management podcast.

Goetsch, an assistant professor of practice and instruction coordinator in UNL’s PGM program, has always been interested in cutting-edge technology and finding creative ways to engage with the program’s audience.



“Podcasting is still a relatively novel medium to most people and it was exciting to give the platform a try as a new way to reach out to and communicate with current and prospective students as well as their families,” he explains. Goetsch decided to name the new podcast “Launch!” as it focuses on providing content to individuals at the beginning of their career journey in golf management.

The Launch! podcast showcases current students, alumni, industry partners and those from within the University who support the program. The goal is to help the PGM audience better understand the program and to hear from a wide variety of people who are connected to PGM and the golf industry in general.

The Launch! podcast can be found at: <https://mediahub.unl.edu/channels/37782>

2020 Leu Lecturer: Sam Fuhlendorf Speaks Nov. 9

Sam Fuhlendorf is featured as the 2020 Leu Lecturer as part of the Center for Grassland Studies’ Fall Seminar Series. The Nov. 9 presentation, *Grassland Management in the Anthropocene: Should We Look to Aldo Leopold or George Jetson?*, will take place from 3:00 – 4:00 p.m. Dr. Fuhlendorf is a Regents Professor and Groendyke Chair in Wildlife Management in the Department of Natural Resource Ecology and Management at Oklahoma State University.

In addition to his lecture, Fuhlendorf will connect with students in rangeland and grassland conservation courses, as well as participate in a discussion with undergraduate and graduate students. Faculty are also scheduled to spend time visiting with Dr. Fuhlendorf regarding his work.

Due to restrictions related to COVID-19, the Leu Lecture will be a virtual event. To learn how to participate in the event, go to grassland.unl.edu/grassland-systems/fall-seminars-leu-lectures. The lecture will be recorded and uploaded to the Center’s website within 24 hours after the original presentation for those unable to attend the livestream event.

Since 1995, the Center for Grassland Studies has offered seminars featuring guest lecturers from across the country who speak on topics related to the Center’s mission; future challenges in grassland stewardship, prairie restoration and management, and new technologies for monitoring and managing grasslands. Each series features a Frank and Margaret Leu Distinguished Lecturer; a person who is nationally recognized for his/her expertise in some aspect of grassland ecology and management.

Managing Pasture Production Risk by Jay Parsons, Associate Professor, Agricultural Economics, University of Nebraska-Lincoln

Livestock producers interested in managing pasture production risk can feel a little helpless at times. One the primary risks in pasture production is precipitation uncertainty. Since weather events are out of the control of the producer and it is impossible to control the probability of poor precipitation, they are relegated to managing the impact of poor precipitation if it materializes. There are two ways to handle this, a person can either control it internally or they can transfer it outside the operation.



There are several risk management practices internal to the operation that a producer can use to control the impact of poor precipitation has on their business. These practices include maintaining extra reserves (i.e. stocking light or storing hay), creating flexibility (i.e. the ability to pull growing yearlings off of the range into feedlots), or using diversity (i.e. cool and warm season pastures located in multiple locations). All of these practices cost money to implement. None of them are foolproof. However, some producers have developed great skill at regularly implementing them with skill and efficiency.

Transferring the risk of low precipitation outside the operation is primarily accomplished through insurance mechanisms. One of the most widely used crop insurance products in Nebraska is Pasture, Rangeland, Forage (PRF) Insurance from the USDA Risk Management Agency. PRF insurance is used to insure perennial forage land against the peril of low rainfall. It is based off a rainfall index produced by the National Oceanic and Atmospheric Administration (NOAA) for grid areas 0.25 degrees longitude by 0.25 degrees latitude or approximately 16 miles by 12 miles in Nebraska. Producers can insure up to 90 percent of normal precipitation in two month coverage intervals throughout the year. If precipitation falls below the insured percentage, the producer would receive an insurance indemnity payment for the productive value of the difference.

For example, suppose a producer insures a productive value of \$24 per acre of grass at the 90 percent coverage level and places half of their coverage in May-June. If the May-June precipitation index turns out to be half of normal, then the producer could receive an indemnity payment equal to 40 percent of \$12 per acre or \$4.80 per acre insured. This indemnity is meant to partially compensate the producer for the poor grass production that is likely to result from this weather situation.

Of course, insurance costs money. PRF premiums are subsidized between 51 and 59 percent depending upon the coverage level chosen but it still costs money for the producer to transfer this risk outside the operation to an insurance company. The signup deadline for PRF for the 2021 calendar year is November 16. RMA is currently seeking public comments for possible improvements to PRF. For more information visit: <https://www.rma.usda.gov/en/Policy-and-Procedure/Insurance-Plans/Pasture-Rangeland-Forage-and-Evaluation-Report>.

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2020 Nebraska Section of the Society for Range Management Annual Meeting Goes Virtual

New Technologies for Monitoring and Managing Rangelands is the theme for this year's annual meeting of the Nebraska Section of the Society for Range Management. The virtual meeting is Thursday, Nov. 5 and Friday, Nov. 6.

The business meeting and award ceremony will take place Nov. 5 starting at 9:30 a.m. (MT). The afternoon session start at 1:00 p.m. (MT) and features **Dirac Twidwell**, University of Nebraska-Lincoln Associate Professor and Rangeland Ecologist, discussing "Monitoring Vegetation Cover on Rangelands" and **Travis Mulliniks**, University of Nebraska-Lincoln Extension Specialist in Range Beef Nutrition, presenting on "Monitoring Animal Performance on Rangelands."

Undergraduate and graduate students present current research projects Friday beginning at 9:30 a.m. (MT). Afternoon sessions begin at 1:00 p.m. (MT) and feature **Mitchell Stephenson**, University of Nebraska-Lincoln Extension Specialist in Range and Forage Management, discussing "Tools for Monitoring Grazing Behavior and Distribution on Rangelands" and **Andrew Little**, University of Nebraska-Lincoln Extension Specialist in Landscape Habitat Management, speaking on "Precision Conservation on Working Landscapes."

Attendance is free. Register at https://unl.zoom.us/webinar/register/WN_vegnnpnXSwC4U0RXosKO8Q. Direct questions to **Jack Arterburn**, 308-249-3717 or jack.arterburn@unl.edu.