Major Issue
Voluntary conservation programs have existed for decades in the United States. Many of these programs incentivize farm-level management that reflects broader conservation objectives, such as conserving soil, water, or wildlife habitat. Collectively, these individual management actions can play a major role shaping how a given landscape functions as part of the broader ecosystem. However, funding levels and acre enrollment targets for Farm Bill conservation programs—the premier conservation offering in the US—have been in steady decline for nearly 15 years.

The dynamics of how natural systems interact with urban or agricultural uses have not always been well understood. To bridge this gap, the concept of ecosystem services emerged to help detect and measure the benefits natural systems directly or indirectly provide to people. These services fall into four major categories: provisioning, regulating, supporting, and cultural (Table 1).

As research sheds new light on the value and accrual of ecosystem services, there is growing recognition that current markets and conservation strategies may not be sufficient to safeguard the array of benefits well-managed landscapes provide to society. Because many of these services are also considered free public goods (e.g., clean water), there is a convincing argument that it is in the national interest to ensure the continued supply and safeguarding of these services. (Continued on Page 4)
The Center for Grassland Studies (CGS) is in a state of transition. I am in the last month of my term as interim director of the Center. I have been the interim director for nearly two years and have enjoyed working with CGS staff, partners, and stakeholders. We’ve seen continued success of CGS programs, including the Grassland Systems and PGA Golf Management undergraduate degree programs, the Nebraska Grazing Conference, and the Fall Seminar Series. And new programs and activities have been initiated, including the podcast series, establishment of Dalbey Prairie, development of a new research experience course in Grassland Systems, and production of videos in collaboration with the Platte Basin Timelapse. Additionally, collaboration with the Center for Resilience in Agricultural Working Landscapes (CRAWL) at the Barta Brothers Ranch and with the Nebraska Integrated Beef Systems Hub have created new grassland-related programs.

The new permanent director is associated with the grazing lands ecologist position, which is expected to be filled in early 2022. The grazing lands ecologist will have a split appointment with 70% teaching and research in the Department of Agronomy and Horticulture and a 30% administration appointment as the CGS director. The new director, of course, is critical to the continued success of CGS.

Liz Husmann, office associate, resigned in early October to take a staff position at the University of Nebraska Medical Center. Liz was a productive member of the CGS team and we hope to have a new person in this position by 2022. Our new office associate will have similar responsibilities as before and will have a joint appointment with CRAWL. Because CGS and CRAWL have some joint programs and are co-located in the suite of offices in 203 Keim Hall, it makes sense for the two Centers to share the office associate position.

The Center for Grassland Studies looks forward to a smooth transition to new personnel and a future of program success.
The devastating outbreak of fall army worms (FAW) in Nebraska decades ago was a repressed memory of widespread devastation for turfgrass managers in Nebraska until 2021. Army worms are so named because of their inclination of moving en masse to greener pastures once they’ve depleted their food supply. It is not uncommon for the caterpillars to move from field crops into nearby turfgrass. In late August, FAW egg masses and moths were detected throughout eastern Nebraska. Egg masses (40 in one yard!) were found in Lincoln and moths were flying abundantly in Omaha. Feeding began 2-3 weeks after that and continued for 2-4 weeks. Fall army worms aggressively feed on ryegrass, fescues, bentgrass, and bluegrass. Interestingly social media, primarily Twitter, gave Nebraska Extension faculty a heads up. While nothing could be done until their arrival, the anticipated infestation was largely predictable. Initial infestations in 2021 were seen in the northern states of the southeast in early May, reported on Twitter and other outlets, feeding in turfgrass, pastures, and hay fields. That’s unusually early for the insect, which does not tolerate cold winters. Overwintering in South America or the southernmost regions of Texas and Florida, the adult moths must slowly make their way north each spring. In 2021 multiple weather events, including a relatively mild winter and lots of tropical storms, resulted in the resilient moths moving rapidly along the eastern seaboard and central US more than “normal.” Social media again gave Nebraskans an indication of the potential for infestations as early as July. When egg masses were first detected in eastern Nebraska, turfgrass managers were alerted via a subscription service (TurfiNfo) and extension faculty were quick to readily share this information with affected parties and turf loss associated with a similar infestation more than 20 years ago was largely averted.

Lesson Learned
Recent advances in insecticide chemistry targeting turfgrass grubs indicated an unanticipated edge, at least in Nebraska, for FAW control. Turfgrass treated in early summer as a preventative application for grubs with products containing chlorantraniliprole (e.g., Acelepryn) or tetraniliprole (e.g., Tetrino) also exhibited good to excellent FAW control. Both active ingredients are also good for curative control of FAW as well as are the pyrethrin based insecticides. One cautionary note for pyrethrin, however, is reports of FAW resistance.

Looking Into the Future
With the increasing ability to predict weather patterns, such warm winters and more tropical storm systems, turfgrass managers have greater opportunities to be proactive in controlling FAW. Managers should consider investing in a sweep net, pay attention to reliable sources like Nebraska Extension for anticipated outbreaks, and study the identification and management of this pest for next season.

Identification features: four dots near end of abdomen, a stripe the length of the body, and Y-shaped head capsule. Photos by B. McGraw, Turfgrass Entomologist, Penn State University.
Ecosystem Services Programs  (Continued from Page 1)

Developing a marketplace, where payments for providing ecosystem services (PES programs) are made to participating landowners, is seen as one approach to increasing environmental stewardship.

RESEARCH SUMMARY

Nebraska is home to one of the largest remaining grasslands in the world, and it is almost entirely stewarded by private landowners. The public benefits derived from such a large, intact landscape are staggering (carbon sequestration, nutrient cycling, water purification and aquifer recharge, wildlife habitat). However, grazing cattle as a livelihood is far from easy. Increasing operational costs, harsh environmental conditions, and shifting population trends in rural areas can make ranching a challenging occupation. Despite the economic uncertainties, there is an expectation that ranchers continue to provide ecosystem services as public goods without compensation—in addition to their core business activities.

Given the importance of ecosystem services to society, the question then becomes how can we make land stewardship more profitable and compatible with traditional agriculture? To help answer this question, we used an ecosystem services approach to see not only if ranchers were still interested in incentivized conservation programs, but to also learn if a payment for ecosystem services program (PES) was plausible in the farms and ranches of the future.

We took the ecosystem services concept one-step further by modeling the management framework provided by the Nebraska Natural Legacy Project (NNLP). This document, developed by a 25-member planning committee, helped us test management actions that had already received considerable feedback from stakeholders. It also allowed us to test ranchers’ receptiveness to nontraditional conservation management (e.g., managing for biodiversity).

At a minimum, we hoped the study would close a feedback loop with ranchers and policymakers about the effectiveness of conservation management actions.

MAJOR FINDINGS

We found that Nebraska ranchers still had an appreciable appetite for conservation programs, but not all programs were equally popular (Table 2). For example, the highest-rated program among ranchers was one that sought to conserve/enhance the biodiversity in grasslands. On the other hand, programs that sought to regulate water flows or invasive species in water sources were the least desirable. Actions related to drought management and woody encroachment were also of particular interest to ranchers who participated.

A second key finding in this study was that money wasn’t the primary driver for participation in any of the conservation programs we tested. In instances where a program was paired with the highest possible payment and shortest possible contract length did not lead to significant increases in participation. We found this to be largely true in nearly all programs we tested—especially those that involved enhanced management of water resources on the ranch.

IMPLICATIONS OF THE RESEARCH

A widely held belief in voluntary conservation programs is that if a program doesn’t pay, then a rancher won’t play. On the surface this may be true, but the reality is far more nuanced. Because grassland ranching involves managing for a certain level of unpredictability, giving up operational control of something as important as water just isn’t worth the risk—regardless of the incentive being offered.

What this means for voluntary conservation programs is that if a given initiative—like those in the Farm Bill—are legislated without direct involvement or feedback from ranchers, money alone won’t be able to generate long-term conservation outcomes. New program offerings may find more success with terms and conditions that acknowledge the uncertainties in ranching (periods of increased flexibility, open access to learning networks, and direct involvement in program administration through stakeholder cooperatives).  (Continued on Page 5)
### Table 2. Ranchers Participation Rate in PES Programs

<table>
<thead>
<tr>
<th>Management Program</th>
<th>Participation Rate</th>
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<tbody>
<tr>
<td>Using grazing practices to improve biodiversity</td>
<td>62%</td>
</tr>
<tr>
<td>Using grazing/haying systems with built-in drought management</td>
<td>42%</td>
</tr>
<tr>
<td>Utilizing native, locally adapted species in restoration/management projects</td>
<td>41%</td>
</tr>
<tr>
<td>Using a combination of grazing and prescribed fire to benefit wildlife or habitat</td>
<td>41%</td>
</tr>
<tr>
<td>Removing or discontinue woody plantings within grasslands or improved pasture</td>
<td>40%</td>
</tr>
<tr>
<td>Using adapted native seed sources for pasture and grassland seeding</td>
<td>35%</td>
</tr>
<tr>
<td>Incorporating wildlife-friendly fencing in grasslands and riparian areas</td>
<td>29%</td>
</tr>
<tr>
<td>Managing in cooperation with other large blocks of habitat to conserve wildlife</td>
<td>29%</td>
</tr>
<tr>
<td>Staggering timing or height of haying to increase plant and animal diversity</td>
<td>24%</td>
</tr>
<tr>
<td>Practicing integrated pest management to enhance biodiversity</td>
<td>23%</td>
</tr>
<tr>
<td>Upgrading or install water conservation measures</td>
<td>22%</td>
</tr>
<tr>
<td>Reducing nutrient and insecticide applications to protect water quality</td>
<td>22%</td>
</tr>
<tr>
<td>Implementing filter strips, grassed waterways, etc. to minimize the effects of fertilizers and pesticides on wetlands and waterways</td>
<td>18%</td>
</tr>
<tr>
<td>Using wildlife-friendly conservation buffers for waterways to prevent siltation</td>
<td>17%</td>
</tr>
<tr>
<td>Removing structures that restrict the natural movement of aquatic species</td>
<td>8%</td>
</tr>
<tr>
<td>Removing introduced “rough fish” or aquatic vegetation to improve water quality</td>
<td>8%</td>
</tr>
</tbody>
</table>

*Note.* Nebraska ranchers who operated cow/calf herds on native grasslands or improved pasture larger than 50 acres were asked to participate in this study. Of the nearly 7,300 ranchers we contacted, 251 chose to participate in this study.

This research also provided insight into education and outreach efforts by natural resource professionals. The leading program choice for enrollment by ranchers—managing herds to increase biodiversity—demonstrated that ranchers understand the importance of biodiversity in grasslands and believe they can directly contribute to its supply. Policymakers and researchers may find increased returns on investment by making biodiversity a focal point of management outcomes and not simply a value-added product.

In the face of declining funding for conservation, there is an obvious need to better understand how to engineer programs that produce positive financial outcomes at the ranch level while enhancing the ability for grassland managers to supply ecosystem services at a landscape level. For more information about this study or PES programs in Nebraska, please contact Kyle Martens at kmartens3@unl.edu.

### FUNDING

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Gray skies and a brief rain shower did not dampen the spirits of the 40-plus individuals attending the Dalbey Prairie open house near Virginia, NE on September 29. The event included a tour of the prairie with plant identification, a discussion of soil health, and a luncheon at the American Legion Club in Virginia. The 137-acre prairie is managed by UNL’s Center for Grassland Studies to support research, teaching, and outreach.

Walt Schacht, interim director of the Center for Grassland Studies, provided a welcome and spoke of Dalbey Prairie being one of the 21 grasslands in the University of Nebraska system. He said the management of the prairie will be assisted by the Dalbey Prairie Stakeholder Advisory Committee (SAC), a nine-person committee reviewing goals and objectives, advising on prairie management, and becoming involved in programming. The SAC will draw on the expertise of several individuals, units, and organizations within and outside the university who are active and experienced in grassland management, conservation, and education.

According to Dave Wedin, professor in the School of Natural resources and director of Dalbey Prairie and Nine-Mile Prairie, the theme of the celebration was grassland conservation in working agricultural landscapes. Wedin also addressed the use of haying and prescribed burns as management tools for prairies and partnerships with state agencies to maintain and enhance biodiversity on prairies.

IANR’s Agricultural Research Division was represented by Dean Archie Clutter who spoke of the history of the larger Dalbey-Halleck Farm, including past research on the property. He reiterated the university’s commitment to the stewardship and maintenance of the prairie. Dean Clutter concluded his comments by saying that the prairie has been assessed as a high priority area for preservation and building integrated systems of agriculture that can be linked to the prairie in the future.

The Wachiska Audubon Society had several members in attendance, each with an interest in prairies and measures taken for their protection and conservation. Bruce Kennedy, a former president of Wachiska, was happy to hear the university kept the best 137 acres of the Dalbey-Halleck Farm and put over 503 acres of the property in a conservation easement before selling it, which is exactly what the group was hoping would happen. Kennedy said, “I want to thank Dr. Clutter for his efforts and to the university for doing the absolute positive right thing.”

Mark Goes, livestock instructor at Southeast Community College in Beatrice, brought students from his range and forage management class to the event. He said, “I hope they get an appreciation for the special nature of this piece of ground.” He went on to say, “There is tremendous diversity here and the ability to identify a vast array of plants in a very short amount of time in a small area is important. The Prairie also provides an opportunity to gain an appreciation for the different plants, why they are here, what they are doing here, how we can encourage the more positive ones, and how we can discourage the negative ones.”

(Continued on Page 7)
Internships are a great way to test drive a profession with a much smaller commitment than accepting a full-time job. They also provide an opportunity to learn from different people and to witness different ways people go about their jobs, run their operations, manage employees, manage resources (financial, natural, and operational), and pursue ongoing training. Plus, it can get students out to a new surrounding where they’ll get to see what other communities have to offer. Maybe the experience helps the student learn that they might want to go in a different direction in the future, but maybe they discover that they love the work more than they thought they would. If a student does a couple internships, they will be able to compare the experiences which will make them better able to pick a full-time job that fits them well. Both the rancher hosting an intern and the intern themselves will likely get outside of their comfort zone and grow through the interactions. Taking the time to explain why you do what you do is a good exercise that allows for reflection on the decisions made to get you to where you are, and interns learn more with each new job or internship they take.

At the present time, there are not many ranch internships available in Nebraska. I firmly believe we need to get more students interested in production agriculture and land stewardship, and a great way to do that is to bring in an intern. I’d love to see more people consider their ability to host an intern on their operations. There is a difference between hiring “summer help” versus hiring an “intern.” Internships should give students a chance to learn about decision-making, why things are done a certain way at a certain time, and overall operation tactics, not just gaining skills on making fence and chopping cedars. Considerations that go into being able to hire an intern include how to pay them, where they will live, how long they will be around, what expectations do they have, what kind of time do you have to give them, and more. Don’t let these considerations discourage you, let’s be creative on how to overcome some challenges you might have. If you’re interested in joining our conversation on how to get more internships available to students, please reach out to me at shelly@sandhillstaskforce.org. I want our ranching community to remain vibrant and I think this is a way we can do it!
In November the Grazing Livestock (GLS) Club had the honor of hosting speaker, Jim Gerrish, via Zoom. Jim Gerrish is a renowned grazing consultant who worked 22 years with the University of Missouri Forage Systems Research Center (FSRC) and currently resides in Idaho and consults privately. Gerrish is well known for helping ranchers across the United States understand and adopt management intensive grazing systems. He is an author of numerous publications and a frequent contributor to the Stockman Grass-Farmer. Additionally, Gerrish co-founded the FSRC grazing management workshop which has been used all over North America.

The GLS Club invited other students within College of Agricultural Sciences and Natural Resources to attend Jim’s presentation on, “7 Things I Have Learned in 40 Years of Grazing.” More that 20 people attended the 45-minute presentation, which was well received with a lot of follow-up questions. Senior Alex Heier reflected on the discussion, “As the amount of rangeland and pastureland continues to decline, Jim offered a unique perspective on how soil health and proper grazing management can boost the productivity of these lands. I enjoyed hearing more about holistic management to serve all stakeholders of the land and how to improve ranch profitability.” Freshman Sadie Ference added, “He was very relatable for students with a ranching background because he is a rancher himself. Overall, it was a great presentation with real-world application.”

The GLS Club, along with the Center for Grassland Studies, is very grateful for Jim’s generosity in sharing his time to speak to the group. Learning from professionals who work in the industry plays a large role in students’ motivation and ability to pursue successful careers.