University of Wyoming | College of Agriculture, Life Sciences and Natural Resources

2024 EDITION - VOL. 1

ROOTS & RANGES

UW Alum & Faculty Lead U.S. Army Training in Scotland
Soldiers Abroad Learn Livestock Handling

Goshen County Ag Expo
UW Research & Extension Center Introduces Fourth Graders to Ag

UW Museum of Vertebrates
Supporting Scientific Outreach and Education through Art

University of Wyoming | College of Agriculture, Life Sciences and Natural Resources

ROOTS & RANGES

2024 EDITION - VOL. 1

Interim Dean
Kelly Crane

Senior Creative Coordinator
Lindsay Conley-Stewart

Senior Editor
Brooke Ortel
University of Wyoming Extension

Editor
Maya Gilmore
University of Wyoming Extension

Layout & Design
Jeremy Cain
University of Wyoming Extension

Contributing Writers
Gregory Nickerson
Wyoming Migration Initiative

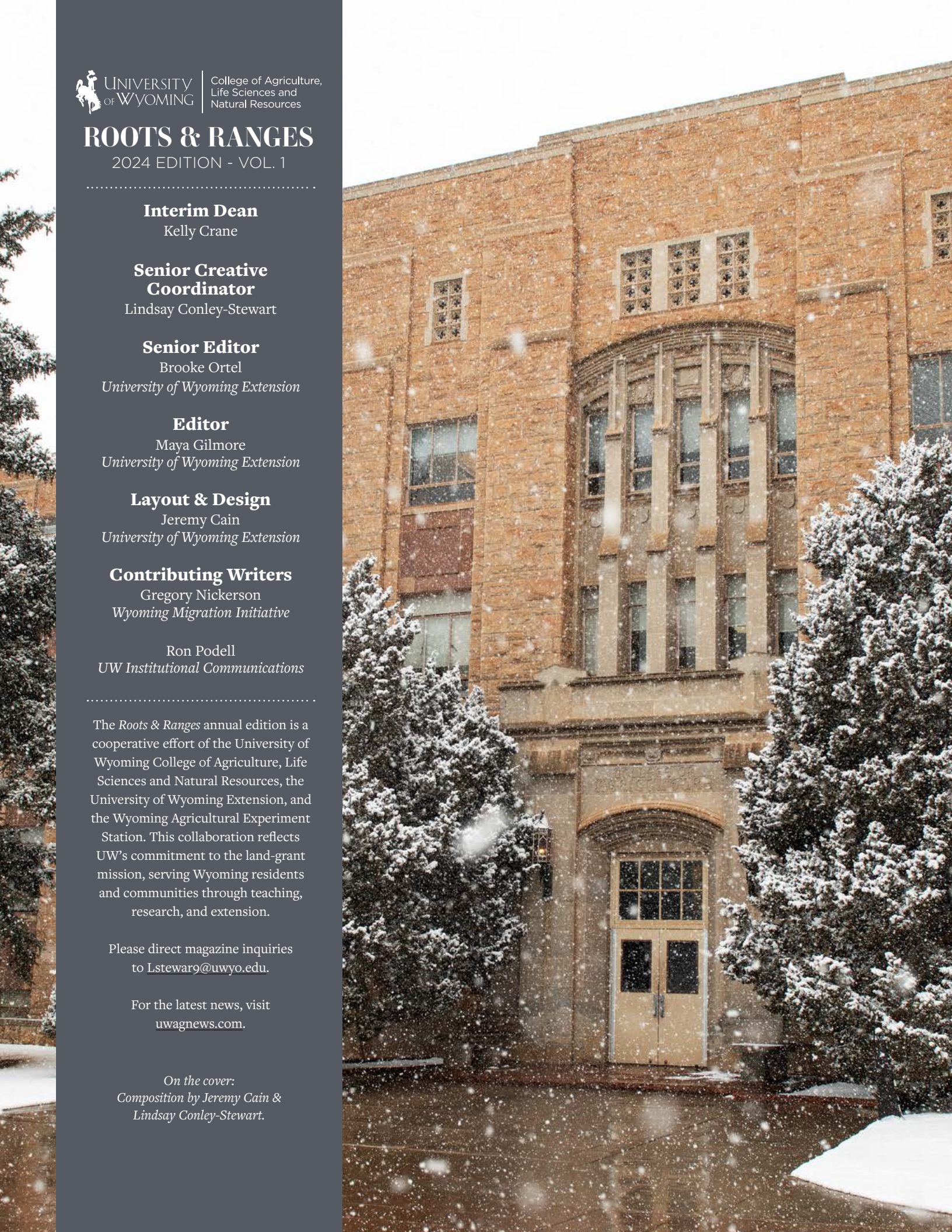
Ron Podell
UW Institutional Communications

The *Roots & Ranges* annual edition is a cooperative effort of the University of Wyoming College of Agriculture, Life Sciences and Natural Resources, the University of Wyoming Extension, and the Wyoming Agricultural Experiment Station. This collaboration reflects UW's commitment to the land-grant mission, serving Wyoming residents and communities through teaching, research, and extension.

Please direct magazine inquiries to Lsteward@uwyo.edu.

For the latest news, visit uwagnews.com.

On the cover:
Composition by Jeremy Cain & Lindsay Conley-Stewart.



ROOTS & RANGES

FEATURES

A MESSAGE FROM INTERIM DEAN KELLY CRANE

I am excited, and proud, to introduce the inaugural issue of *Roots & Ranges*, a magazine dedicated to showcasing the breadth and depth of our college's impact.

The UW College of Agriculture, Life Sciences and Natural Resources (CALSNR) is deeply rooted in the land-grant tradition and this publication is a testament to our ongoing dedication to those ideals. We are committed to ensuring our educational programs are accessible, relevant, and responsive to the needs of those we serve. Our college serves Wyoming through educational opportunities that support our students, workforce, and communities.

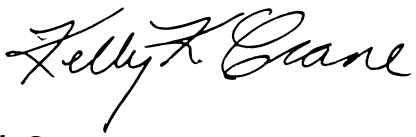
Much like Wyoming's diverse landscapes, CALSNR encompasses a wide range of academic disciplines and learning opportunities. From animal science and botany to rangeland management and dietetics, our programs are as varied as Wyoming's mountains and rangelands. Thanks to our exceptional faculty, research facilities, and statewide extension presence, I believe our college is unsurpassed in its capacity to provide a truly comprehensive educational experience for our students.

Our service to Wyoming extends beyond the classroom, bringing university research and resources to communities across the state. Our commitment to statewide engagement is apparent through the profound impacts of UW Extension, the Wyoming Cooperative Fish and Wildlife Research Unit, the Rocky Mountain Herbarium, the Wyoming Agricultural Experiment Station, and other outreach efforts. Whether it's engaging with local producers and business owners, nurturing 4-H youth, or sharing research with the public, CALSNR's outreach programs empower local communities to solve practical problems.

Through the collaborative efforts of our faculty, staff, students, and community partners, CALSNR continues to build a brighter future and serve Wyoming's evolving needs. Our research endeavors are supported by diverse collaborators, including federal and state agencies, industry groups, nonprofit organizations, and other research institutions, all of whom offer invaluable expertise and resources.

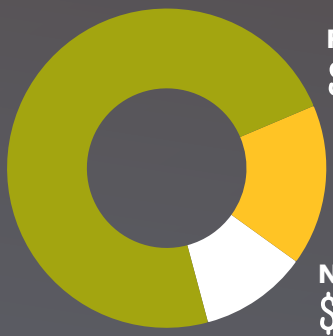
As you peruse *Roots & Ranges*, we invite you to join us in celebrating our educators, students, and collaborators. Thank you for your continued engagement. I am grateful and humbled by your support for our college and UW. We look forward to continuing this journey with you.

Warm regards,



Kelly Crane
Interim Dean, UW College of Agriculture,
Life Sciences and Natural Resources

$138,913,025
Total Research Funding



Federal Direct
$101,105,395

Federal Passthrough
$22,668,804

Non-Federal
$15,138,826

1,255 Undergraduate Students
289 Graduate Students

THE COLLEGE OF AGRICUTLURE, LIFE SCIENCES AND NATURAL RESOURCES

4,811 Extension Programs Delivered

Reaching over 117,361 Stakeholders

Facilitating over 11,457 Instructional Hours

20+ Student Organizations

12:1 Student to Instructor Ratio

Over $810,000 in 2023–2024 Student Scholarships

FACULTY SPOTLIGHT

SARAH LEE

written by **Maya Gilmore**, *University of Wyoming Extension*

Sarah Lee, assistant lecturer in the UW Department of Family and Consumer Sciences, knows better than most how to maintain strong connections in unconventional learning environments. Lee first began teaching online classes more than two decades ago. She continues to find innovative ways to connect to her students, whether she sees them behind a desk or through a screen.

Throughout her time as a teacher, Lee has challenged her students to achieve more than they thought possible. "Not only did Sarah Lee change my life, but she inspired me to want to change other lives as she did mine," says former student Korlyn Sweeney, who graduated in 2023. "I now am a kindergarten teacher, and I use the methods and knowledge she has passed on to me every day."

Lee's holistic support of her students helps them learn skills that apply beyond the classroom. One student credits Lee's classes with helping her become more open to others' perspectives, learning to budget her time effectively, and even opening a retirement savings account.

"Sarah is highly adept at building rapport and community among students in the classroom and the online environment," notes Jill Keith, head of the Department of Family and Consumer Sciences.

Lee's students highlight a variety of techniques she uses to stay connected digitally. For example, she implements consistent office hours, weekly email updates, and video recordings. She also teaches students how to effectively use tools like Google Forms, Padlet, and Zoom rooms. And Lee doesn't just use these technologies herself—instead, she shows students how to take advantage of digital tools to connect with each other as well.

Lee has also helped non-traditional students beyond UW, developing a hybrid online/in-person course for 14 women at the Wyoming Women's Center in fall 2023. This child development class was a part of the Wyoming Pathways from Prison initiative. Lee went above and beyond to support their learning and create additional opportunities for these students to engage in online material.

Lee received an outstanding educator award from the College of Agriculture, Life Sciences and Natural Resources in spring 2024. Her students' testimonies illustrate how deserving Lee is of the recognition.

"It took only a day of class for me to realize that Sarah was something different—we weren't just little boxes with names to her," says Christian Pellatz, an elementary education major who graduated in May 2024. "Love knows no bounds, and neither does the will of an educator like Sarah to enrich the life of every student." ■

FACULTY SPOTLIGHT

CHRIS NORTH

written by **Maya Gilmore**, *University of Wyoming Extension*

For many students, introductory science courses are a box to check before moving on to more exciting material. But it's a different story for students in Chris North's classes.

North is an instructional professor in the Department of Botany, the associate director of the Life Sciences Program, and the course coordinator for General Biology (LIFE 1010), a prerequisite for many degree programs.

North saw opportunity in a class many might overlook, and his leadership elevated not just his course section, but also the UW Life Sciences Program as a whole.

"Because of the extent of the impact of LIFE 1010 across hundreds of students and dozens of degree programs each semester, I suspect that few, if any, other members of our campus community have had a more broadly beneficial impact than Chris North," says Jonathan Prather, director of the Life Sciences Program.

In North's role as course coordinator for LIFE 1010, he has produced short videos that summarize key course content, kept all instructors on the same page, and mentored two laboratory coordinators.

North's fellow instructors also recognize his skill as an educator. "In our time together, it was easy to tell that Chris was someone who really cared about students, understood how to teach well, and who just 'got it' in terms of our task, opportunity, and limitations in a large introductory course and accompanying lab," says John Willford, assistant director of the WWAMI (Washington, Wyoming, Alaska, Montana, and Idaho) Medical Education Program.

North was a fellow in the first cohort of the Learning Actively Mentoring Program (LAMP), a professional development program that aims to improve active learning and student engagement in STEM classes by evaluating which teaching strategies are most effective.

In addition, North has led a number of projects that provide students with practical research experience, including the Course-based Undergraduate Research Experience (CURE) program. The CURE program takes undergraduate students through the process of developing a research question, collecting and analyzing data, and presenting their findings.

In spring 2024, North received an outstanding educator award from the College of Agriculture, Life Sciences and Natural Resources in recognition of his talent for engaging students, dedication to ongoing education, and leadership within his program and department. Perhaps his greatest contribution, though, is inspiring students to connect to science, even in introductory courses. ■

FACULTY SPOTLIGHT

BRIAN SEBADE

written by **Brooke Ortel**, *University of Wyoming Extension*

If you asked Brian Sebade to name all the plants growing in your field, pasture, or backyard, he could do it. If pressed, he'd probably nonchalantly rattle off their scientific names as well.

After more than a decade working as a county educator for UW Extension, Sebade brought his passion for plants back into the college classroom. Since fall 2023, he has served as assistant lecturer in the UW Department of Ecosystem Science and Management (ESM). In addition to teaching "Principles of Rangeland Management," a foundational class for students majoring in rangeland ecology and watershed management, Sebade also leads plant identification classes and labs.

Already, students and colleagues have recognized not only his encyclopedic knowledge of rangeland plants, but also his warmth, good humor, and genuine care for those around him.

"Mr. Sebade created a classroom environment of comfort and lightheartedness in one of the more rigorous 'weed-out' classes in the rangeland program," writes a student who nominated Sebade for UW's 2024 Promoting Intellectual Engagement (PIE) awards. "He was always willing to drop what he was working on and help us out if we asked, which we did, a lot. He also modeled a passion for plants that made us laugh, but inspired us to want [to] work harder, too."

Sebade was once a student in the same department, earning his bachelor's and master's degrees in rangeland ecology and watershed management before joining UW Extension in 2011. His extensive on-the-ground experience and practical knowledge is a strength in the classroom, students and colleagues agree.

Students note that the examples Sebade shared from his extension experience helped anchor their learning, connecting the classroom to the real world.

"Brian doesn't just know the plants, he knows the systems and understands the local perspectives of people in the state," says Tim Collier, head of the ESM department. "He knows the problems people face in terms of rangeland management in Wyoming, and he imparts that to students."

UW's PIE awards honor instructors who inspire excitement, inquiry, and autonomy in classes for first-year students. According to his pupils, Sebade does just that, structuring classes so that "no student could walk away without learning how to learn on their own."

Throughout the courses he teaches, Sebade encourages peer-to-peer learning and mentorship. In a class that required memorizing 20 plants each week, for example, he facilitated tabletop discussions so that students could share their most successful study methods with one another.

Rather than simply lecture, Sebade actively engages students, drawing on what they already know and inviting them to join the conversation, Collier notes. Even in large introductory classes, "he often asks them questions and gets them to fill in the blanks, using their own knowledge."

Whether it's outdoors, in a lecture hall, or hunched over plant samples in the rangeland ecology herbarium, one thing is clear: Sebade is an outstanding educator. ■

UW MUSEUM OF VERTEBRATES SUPPORTS SCIENTIFIC OUTREACH AND EDUCATION THROUGH ART

written by **Maya Gilmore**, *University of Wyoming Extension*

Walking into the University of Wyoming Berry Biodiversity and Conservation Center, art is everywhere you look. As you descend the wide staircase to the UW Museum of Vertebrates, metal hawks fly across the high beams of the ceiling. Footprints from many different creatures, including elk and bear, track their way across the atrium and into the hallways. The hall to the museum is decorated with student art of birds and skeletons.

Natural history museums are traditionally places of science, but the Museum of Vertebrates has a long record of working with artists to educate the public, foster relationships, and build understanding between people working in different fields.

"Museum work is not just science. It's a little bit of history, art, detective work, and culture of the people that lived in the area," says Beth Wommack, staff curator and collections manager of the Museum of Vertebrates. "People interested in science can come from anywhere."

WHAT IS A VERTEBRATE MUSEUM?

The UW Museum of Vertebrates is dedicated to preserving vertebrate species, from Wyoming toads to prairie grouse to a mountain zebra.

In contrast to geology or anthropology museums, vertebrate museums primarily contain modern or recently extinct species. The Museum of Vertebrates boasts dry collections, tissue samples, and wet collections, for a total of 22,000 specimens from 865 different species. The dry collection preserves mammals and birds, including skeletons, skins, nests, eggs, and scat, while the wet collection preserves whole reptiles, amphibians, fish, parasites, and animal parts stored in ethanol.

Museum volunteers help maintain records and prepare animals to be preserved, which can involve freezing tissues, cleaning skeletons, preparing skins and pelts, or preserving whole animals in ethanol and formalin.

CREATING RELATIONSHIPS ACROSS WYOMING

Since the Department of Zoology and Physiology became part of the College of Agriculture, Life Sciences and Natural Resources in 2022, Wommack has found new opportunities to build relationships with people across the state.

"I think being part of ag opens up new opportunities and ways we can connect with a large proportion of Wyoming's rural community," says Wommack. "People that are on the land know about that habitat, and connecting with them is going to be really exciting. They experience natural history every single day."

Wommack and Matt Carling, faculty curator of the Museum of Vertebrates, have also prioritized building relationships with members of the Wyoming Game and Fish Department and other state and federal organizations that deal with wildlife. In some cases, agency collaborators are former UW students who have personal experience working with the museum.

Those relationships help the museum navigate permits and provide other benefits. Members of the Game and Fish Department sometimes donate animals the museum might not receive otherwise—allowing those animals to be remembered for as long as the collection lasts.

Wing of a barn owl (*Tyto alba pratincola*). Photo by David Keto.

Above: Picture of a black bear (*Ursus americanus*), from Jeff Turcotte's final project with the Museum of Vertebrates. Photo by Jeff Turcotte.

On page 9: Mount from the Riley Collection of a crested porcupine (*Hystrix cristata*). Photo by David Keto.

SEEING ANIMALS IN A NEW WAY

One such animal that the Game and Fish Department donated to the Museum of Vertebrates was a problem black bear that was put down because it was eating human food. Wommack and student volunteers set out to prepare and preserve the large mammal.

At the time, museum volunteer Jeff Turcotte was in the final semester of his zoology and physiology degree. As a photography minor, Turcotte was in a unique position to preserve this bear in another way as well.

Turcotte decided to set up an automated camera above the preparation area, taking a picture every 10 seconds. He later turned this footage into a time lapse video. In addition, Turcotte took photos of the preparation process using a digital camera.

Turcotte believes his project can help museum volunteers and those unfamiliar with natural history museums understand each other better. "By taking these single images and removing context, it can assist in showing how some unsuspecting member of the public might see this," says Turcotte.

In addition to helping community members and scientists connect, art can help people connect to the animals themselves. Through art, people can identify with unfamiliar creatures. Many Wyomingites regularly interact with large game species, but they might not know as much about species like warbling vireos or southern red-backed voles.

"People approach animals in a certain way, and seeing them in art allows them to approach them in another way," says Carling. "The more connected people feel to the places around them, the better off we are in trying to conserve [those places]."

ART AS EDUCATION

Art can also help teach people about science. For example, a set of three paintings from the project *The Art of Hybridization* hangs in the Berry Center. This project was funded by a Novel Outreach and Education grant from the Wyoming Biodiversity Institute. It was a collaboration between Wommack, former graduate student Paul Dougherty, and Lander-based artist Rosie Ratigan.

The project aimed to come up with new ways to teach people about hybridization, or what happens when animals from two different species interbreed. Ratigan created several oil paintings

> “People approach animals in a certain way, and seeing them in art allows them to approach them in another way.”

of birds, including the three large artworks on display in the Berry Center. In the outer paintings, Ratigan depicted parent species—lazuli and indigo buntings, red-shafted and yellow-shafted northern flickers, and Bullock’s and Baltimore orioles. In the middle, she showed the resulting hybrid offspring species.

During the collaboration, each party had to learn to think in a different way. It was important to the scientists that Ratigan portray the correct number of feathers in a spread wing. On the other hand, Ratigan paid attention to factors like movement, drawing the viewer into the painting by showing birds flying toward the center of the image.

“Sometimes high-level art and high-level science can both be alienating to the general public,” says Turcotte. “By bridging the gap between them and combining them, you can bring the concepts down to a point where anyone can understand.”

HERE TO BE USED

Though the Museum of Vertebrates welcomes monetary support, Wommack and Carling encourage other kinds of donations as well. The museum is always looking for volunteers and also accepts salvaged animals from the public.

For Carling and Wommack, museum collections are made to be used, and it’s difficult to guess what they might be used for next. A century ago, for example, no one could have predicted that bird specimens would be used to track how much coal was in the air during the industrial era. “Museums are time machines,” says Carling.

This window into the past can be used in myriad ways, and Carling and Wommack embrace new suggestions. They ask that people request access to the collections at least two weeks in advance and treat the specimens with respect. As long as these requests are followed, though, they encourage members of the public to reach out. “We’re always waiting for someone to do something new with the collection,” says Wommack. “We want to have that conversation.”

To learn about how you can connect with the UW Museum of Vertebrates, contact Wommack at ewommack@uwyo.edu or check out the museh um’s website at https://bit.ly/vert-museum. ■

Mule deer are the state's most iconic migratory ungulate. Each spring and fall, herds make journeys up to 150 miles one way across Wyoming's vast landscapes. Photo by Gregory Nickerson.

UW RESEARCHERS CHART UNGULATE MIGRATIONS IN THE WEST

written by **Gregory Nickerson**, *Wyoming Migration Initiative*

Hooved mammals, also known as ungulates, migrate throughout the American West each spring and fall to access nutritious plants and avoid deep snow. But, as the human footprint in the West expands, these species increasingly face obstacles posed by new subdivisions, energy development, impermeable fences, and high-traffic roads. By mapping their migrations, scientists provide critical information—such as where migrations overlap with existing and potential obstacles—to managers, policymakers, nongovernmental organizations, and private landowners.

Since 2018, researchers at the U.S. Geological Survey's (USGS) Wyoming Cooperative Fish and Wildlife Research Unit have led the Corridor Mapping Team, a state-tribal-federal partnership working to map ungulate migration corridors.

In spring 2024, the team released a new set of maps documenting ungulate movements. These maps, published in the fourth volume of "Ungulate Migrations of the Western United States," reveal the migration routes and critical ranges of 33 mule deer, pronghorn, and elk herds.

The first three volumes in the "Ungulate Migrations of the Western United States" report series were published in 2020 and 2022. With this latest volume, the series now details the migrations and seasonal ranges for a total of 182 unique herds across 10 states.

Contributors to the new volume include wildlife agencies in Arizona, California, Nevada, New Mexico, Utah, Washington, the Wind River Indian Reservation, Wyoming, and—for the first time—Oregon, Colorado, and the Pueblo of Tesuque in New Mexico. Maps of each herd were produced in collaboration with state and tribal experts by cartographers from the USGS and the InfoGraphics Lab at the University of Oregon.

"We've now mapped nearly 200 migrations of mule deer, pronghorn, elk, and other ungulates across diverse landscapes, from the high alpine Rocky Mountains to the temperate rainforest of the Pacific Northwest and the desert ecosystems of the American Southwest," says Matt Kauffman, the report's lead author and a wildlife biologist with the Wyoming Cooperative Fish and Wildlife Research Unit. "I'm impressed with how the team has worked together to adopt a standard set of methods to create robust migration maps of these ungulates across the West."

The new report highlights how migration maps can be used for conservation and management amid changing landscapes. For example, solar farms can reduce habitat and create barriers to movement for resident and migratory animals.

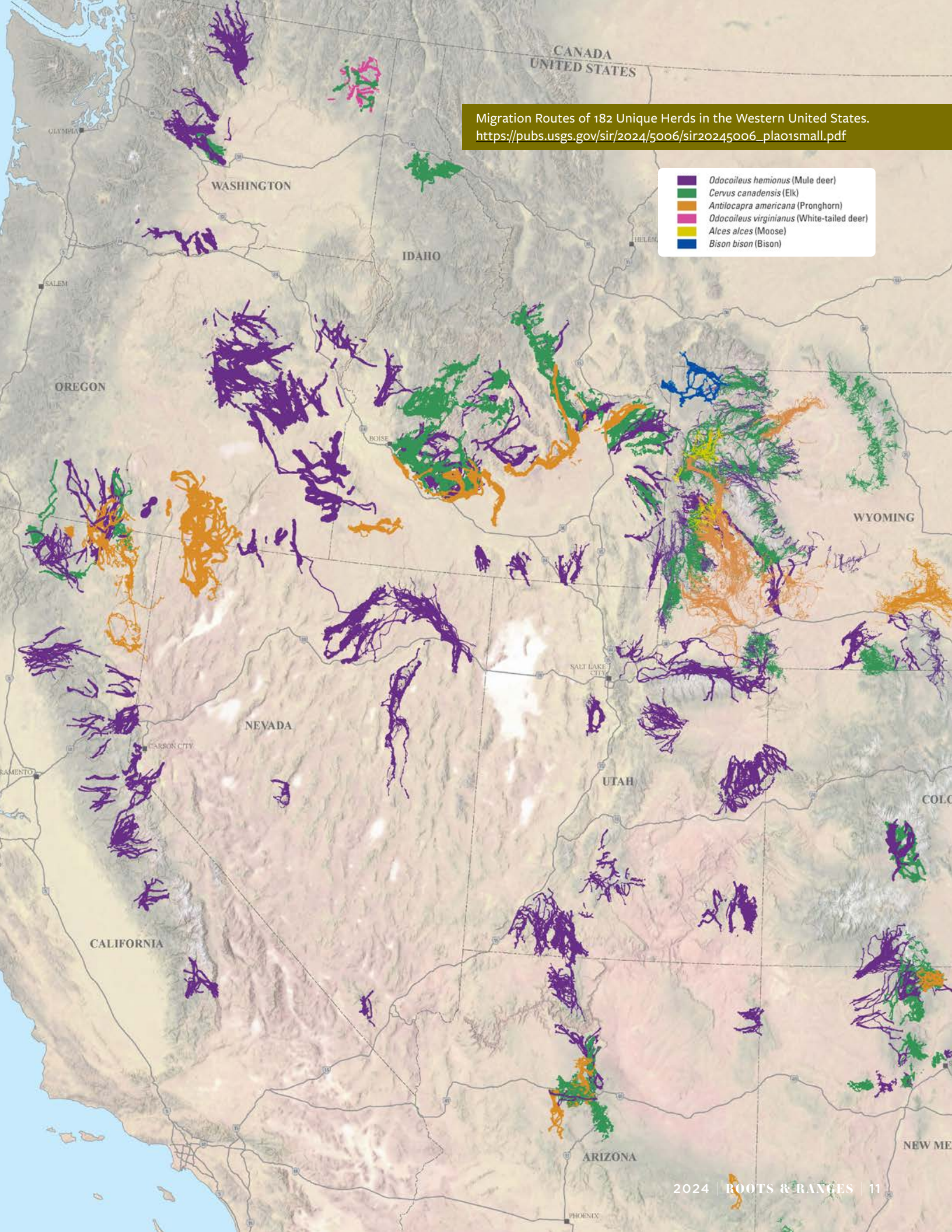
Previously, the maps featured in the report series have been used to inform leasing decisions for oil and gas development. They also can provide a key resource to help site future renewable energy projects to minimize effects to critical habitat.

"To best conserve and protect the habitat used by migrating elk, mule deer, moose, and pronghorn, we have to know exactly where these species move across the landscape," says Blake Henning, chief conservation officer at the Rocky Mountain Elk Foundation. "That's why this mapping work is so important—it's to ensure their future health and well-being. We support and greatly appreciate the USGS and collaborating states and tribes for leading this highly collaborative and globally significant effort."

In addition to managers from state wildlife agencies, co-authors of the fourth volume include the U.S. Forest Service, U.S. Fish and Wildlife Service, National Park Service, Bureau of Land Management, Navajo Nation Department of Fish and Wildlife, Pueblo of Tesuque Department of Environment and Natural Resources, and Shoshone and Arapaho Tribal Fish and Game, among other partners.

Thanks to funding from the USGS and the Rocky Mountain Elk Foundation, mapping is ongoing, with a fifth collaborative volume of migration maps currently in preparation.

To explore migration routes and ranges, visit the interactive portal at www.westernmigrations.net, or download the map files from www.sciencebase.gov. ■



Migration Routes of 182 Unique Herds in the Western United States.
https://pubs.usgs.gov/sir/2024/5006/sir20245006_pla01small.pdf

UW RESEARCHER STUDIES WHY HUMMINGBIRD NUMBERS ARE DECLINING

written by **Ron Podell**, *UW Institutional Communications*

A broad-tailed hummingbird is released in the Bighorn Mountains near Buffalo after its physical exam, which included donating a blood sample for disease and population genetic studies. Holly Ernest, a UW professor emeritus of wildlife genomics and disease ecology, is the corresponding author and co-first author of a paper titled "Illuminating the Mysteries of the Smallest Birds: Hummingbird Population Health, Disease Ecology and Genomics" that was published Feb. 15 in the *Annual Review of Animal Biosciences*. The study provides a summary of current understanding of population health, disease ecology, and genomics as they relate to hummingbirds. Photo courtesy of Holly Ernest and Braden Godwin.

Hummingbirds devour hundreds of flying insects each day, including mosquitoes, and provide pollination for reproduction of flowers and plants.

However, this important bird species is in decline worldwide, and a University of Wyoming researcher has delved into the reasons—as well as possible ways to preserve hummingbirds in the future.

Holly Ernest, a UW professor emeritus of wildlife genomics and disease ecology, was the co-first author of a paper titled "Illuminating the Mysteries of the Smallest Birds: Hummingbird Population Health, Disease Ecology and Genomics," which was published in the *Annual Review of Animal Biosciences* in February 2024. The paper reviewed key scientific findings over the past 100 years.

"I wrote this review paper, with collaborators' help, to provide a summary of current understanding of population health, disease ecology, and genomics as they relate to hummingbirds," says Ernest, who retired in 2022 as Wyoming Excellence Chair in Disease Ecology in the Department of Veterinary Sciences and as mentoring professor in the Program in Ecology and Evolution.

"We appraised knowledge gaps; causes of morbidity and mortality, including disease; and threats to population viability. Finally, we highlighted areas of research need and provided ideas for future studies aimed at facilitating hummingbird conservation," says Ernest.

WYOMING HUMMINGBIRD SPECIES

During the summer, three species of hummingbirds regularly breed in Wyoming. The most common species in Wyoming is the broad-tailed hummingbird.

In the higher elevations of mountains, calliope hummingbirds breed. They are the smallest bird

in the continental Americas, weighing as little as 2.5 grams, or half the weight of a U.S. nickel.

Near streams and rivers, black-chinned hummingbirds are occasionally seen in Wyoming. Additionally, rufous hummingbirds commonly visit Wyoming feeders as they migrate to breeding areas farther north into Montana and western Canada.

HUMMINGBIRD HAZARDS

The International Union for Conservation of Nature's Red List of Threatened Species names 191 hummingbird species with decreasing population trends and 71 other hummingbird species with "unknown" trends as of July 2023.

Though hummingbirds are still seen at feeders, a wide range of hazards and threats have caused many hummingbird populations to decline. These hazards include climate change, wildfires, habitat degradation and loss, and exposure to toxins and nonnative predators, including outdoor domestic cats.

Hazards vary by species and ecosystem. "Climate change affects them in a number of ways that we know about and probably many more that we don't," Ernest says. "One example is a mismatch of migration timing with plant flowering that hummingbirds depend on. Another example is the effect of changing climate with invertebrate communities, including insects that hummingbirds need for their protein source."

Outdoor domestic cats kill many birds, including hummingbirds. Ernest suggests that pet owners keep their cats inside, if possible.

High-rise buildings, especially those with glass, kill hundreds of thousands of birds globally every year, including hummingbirds. Experts from the National Audubon Society and the Cornell Lab of Ornithology suggest a number of ways to prevent birds from hitting windows, including installing bird-safe glass during construction or renovation.

Loss, fragmentation, and pollution of hummingbird habitats is also a concern. "Some hummingbird species are generalists in that they sip nectar from all flowers, but many are specialists, even to one or a few species of flowering plants," Ernest says. "If those plants disappear, so do the hummingbirds."

Physiological stressors like air, land, or water pollution exacerbate disease risk, which also can threaten population viability, Ernest adds.

OPPORTUNITIES FOR FUTURE STUDIES

In the paper, Ernest and her co-authors identify several existing study methods that may be useful in determining the best direction for the future conservation of hummingbirds.

For example, bird leg banding, used to collect data and samples, is already an important research tool for studying hummingbird disease ecology and genomics. In North America, bird banding data have allowed researchers to assess sex-specific prevalence of diseases; rates of species hybridization; longevity; and migration ecology, according to the paper.

Additionally, radio telemetry studies are used for locating and tracking hummingbird movements. The miniaturization of radio transmitters has allowed for expanded use with less impacts on hummingbirds' flight and behavior. Previous radio telemetry studies have assessed the effect of tropical deforestation on hummingbirds' landscape movement patterns; patterns of habitat use; hummingbird interactions with nectar-producing plants; and migration ecology.

For scientists studying disease ecology and epidemiology in hummingbirds, genomic science has created new opportunities. For example, avipoxvirus—wart-like growths on feather-free areas of the skin—is one disease that could be studied in more detail using genomics.

A COLLABORATIVE EFFORT

Ernest started conducting literature research along with her co-authors in 2007 in California. Ernest moved her wildlife disease ecology and genomics lab and hummingbird research to UW in 2014. She then invited co-authors with expertise in hummingbirds—from South America to Canada—to help provide ideas for the review paper. A comprehensive review of the literature began in early 2022, with the paper completed in October 2023.

"I was honored to be invited to write this paper, and it is a wonderful capstone to the hummingbird health and conservation parts of my career," Ernest says. "It was a great opportunity to reconnect with hummingbird research and conservation colleagues as I asked for help with the paper." ■

Bruce Hoar gently removes a hummingbird from a feeder trap in the Wind River Range near Dubois. Hoar is now retired from UW, following his years as the Wyoming brucellosis coordinator for the UW Department of Veterinary Sciences. Photo courtesy of Holly Ernest and Jessica Grant.

"In the end, what I have control over is training students and young researchers to do good science."

Professor David Fay

MOLTING ROUNDWORMS MAY UNCOVER CLUES TO UNDERSTANDING CANCER

written by **Maya Gilmore**, *University of Wyoming Extension*

David Fay, a professor in the UW Department of Molecular Biology, has spent his career studying a tiny roundworm. Specifically, for the last decade, Fay has studied the genes that control how the roundworm *Caenorhabditis elegans* molts.

As it turns out, humans have genes that are very similar to the genes that help this roundworm molt. In fact, Fay's lab has discovered that human genes could be implanted into mutant roundworms missing some specific molting genes, and the worms could then successfully molt using the replacement human genes.

"You're uncovering universal biology that will apply up and down the animal kingdom," says Fay. "These are fundamental cellular processes that are needed for molting."

MOLTING GENES IN HUMANS

In humans, molting-associated genes control the way that cells pass proteins and other substances from cell to cell, allowing old material to be broken down and new material to form in the right place. When growing a new fingernail, for example, many cells coordinate where the new nail ends up.

Some of these molting genes are also strongly connected to cancer. When processes controlled by these genes go wrong, cells can end up with materials they shouldn't have, like someone ordering a hammer and receiving a drill. This could lead to the abnormal cell growth characteristic of cancer—in other words, equipped with the wrong materials, the builder might start trying to hammer in screws.

Much of the research on cancer has focused on cell division. Concentrating on the way cells move materials instead might help researchers discover new ways of detecting or preventing the disease.

WHY STUDY WORMS IN WYOMING?

Fay chose to study *C. elegans* for several reasons. These worms reproduce quickly, their genome is well-understood and easy to manipulate, and the worms are transparent, making it easy to see how different experiments affect their insides.

Most people might not expect a huge medical advance to come from a sparsely populated state with just one public university. But Fay believes that scientific breakthroughs can come from anywhere, as long as the science is conducted meticulously.

That's exactly why he values working at UW. The university provides valuable opportunities to students who might not otherwise have a chance to contribute to cutting-edge science. "You can make a real impact here," says Fay.

Fay takes pride in the researchers he's trained, some of whom have gone on to faculty positions at prestigious institutions like the National Institutes of Health, Rice University, and George Washington University.

"There's a lot about science that feels out of your immediate control, including where the experiments take you and whether you can maintain funding to support your work in what has always been a very competitive environment," he says. "In the end, what I have control over is training students and young researchers to do good science." ■

RANGELAND ECOLOGY & WATERSHED MANAGEMENT PROGRAM PREPARES UNDERGRADS FOR SUCCESS

written by **Brooke Ortel**, *University of Wyoming Extension*

Wyoming is a rangeland state, known for its vast expanses of public lands and rich agricultural history. It's also home to one of the top rangeland ecology and management programs in the country.

Housed in the Department of Ecosystem Science and Management, the University of Wyoming Rangeland Ecology and Watershed Management (REWM) Program offers unique opportunities for hands-on learning and applied research.

"We have been among the largest undergraduate degree programs in rangeland ecology and management in a public lands state," says Jeff Beck, program lead and professor of ecosystem science and management. "Our students are highly sought after."

The REWM Program is accredited by the Society for Range Management, a professional society for land managers, ranchers, scientists, educators, students, and conservationists.

Currently, about 60 undergraduates are enrolled in the REWM Program, nearly two-thirds of whom are in-state students. Tim Collier, head of the Department of Ecosystem Science and Management, estimates that about 90 percent of students who graduated in 2023 secured jobs in resource management at graduation.

CAREER PREP

Whether students are interested in pursuing a career in land management or returning home to the family ranch, the REWM Program sets them up for success.

Many REWM graduates go on to work with federal and state land management agencies, including the Wyoming Game and Fish Department, Bureau of Land Management, U.S. Forest Service, and Natural Resources Conservation Service. Others pursue careers with environmental consulting firms, private ranches, non-governmental organizations, and land reclamation companies.

Brian Sebade, assistant lecturer in the ESM department, demonstrates how to texture soils by hand at UW Extension's annual Ranch Camp program. Photo by David Keto.

"If I had to do it over again, I'd do the exact same thing, because there's a lot of opportunities with this degree," says Jason Pindell, a REWM alum and rangeland management specialist for the U.S. Forest Service. "Currently there is a pretty high demand for rangeland management specialists, but that's not the only place that I've seen my cohort go to work. There's a lot of private opportunities too."

Fellow REWM graduate Russell Burton, for instance, serves as a natural resources field services project manager for Y2 Consultants. At UW, he double majored in REWM and wildlife and fisheries biology and management, a decision he says has been key to his success.

A WELL-ROUNDED PROGRAM

UW's first range management course was taught in 1936. Since then, the program has grown and evolved with the field, expanding to encompass hydrology and watershed management as well.

While the REWM Program often attracts students who grew up on ranches or farms, the degree isn't just for those with agricultural experience, says Abby Perry, a UW Extension educator and REWM grad. Often, students with other backgrounds bring unique perspectives to the classroom.

"I would tell any prospective student that if they like to work with their hands and be outdoors, then the Rangeland Ecology and Watershed Management Program is the place for them," comments current student Anna Krepel.

Degree requirements include 18 credit hours in core topics such as range management principles, plant identification, vegetation management, herbivore ecology and management, and rangeland monitoring and assessment. The program also offers courses in soil science, remote sensing, statistics, hydrology, and animal biology.

For students seeking specialization within the program, the Department of Ecosystem Science and Management offers minors in insect biology, forest resources, soil science, and reclamation and restoration ecology.

Pindell encourages incoming students to consider pursuing at least one minor. His minors in forest resources and soil science have proved invaluable in his current role, which involves grazing management in the Shoshone National Forest.

The REWM degree can also be a valuable foundation for pursuing a secondary degree in a related field. Perry, for example, earned a master's in agricultural and applied economics after completing her bachelor's in rangeland ecology and watershed management. Both degrees have helped her succeed as a UW Extension agriculture and natural resources educator, she says.

FIELD EXPERIENCE

"It's an applied science program," Perry explains. "Not only are you getting the experience of going to college and being responsible for yourself, but you also learn about the science, you learn about recording data, you learn about going out in the field—all that applies to a lot of different fields."

In addition to classroom learning, many REWM students participate in faculty-led research projects and field-based internships. Krepel, for instance, worked as a summer field technician at UW's McGuire Ranch outside Laramie in 2024.

The REWM Program also prepares students for external fieldwork experiences that complement their degree. For example, both Burton and Pindell supplemented their UW education through seasonal jobs with land management organizations like the U.S. Forest Service and Bureau of Land Management.

MEMORABLE MENTORS

For many REWM alumni, outstanding faculty mentorship was a cornerstone of their undergraduate experience.

"I remember realizing—I think in one of Jeff Beck's classes—that part of why I'm successful is because I've been able to build a relationship with a professor," Perry recalls. "That building a relationship pushed me to be the best that I could be because there was substance there. I wasn't just another name on the paper."

According to Krepel, that's still very much the case. "Forming personal relationships with the faculty in the program is easy and rewarding," she comments. "That would also be my advice—that they [new students] ought to get connected with faculty as soon as possible."

Pindell agrees. "I think the best part about it was that the instructors were all very approachable," he reflects. "I felt like the instructors really wanted to see folks succeed."

FINDING COMMUNITY AND FULFILLMENT

The REWM Program isn't just about faculty mentorship and outstanding academics. Engaging with other students, alumni, and professionals

is a key part of the program as well—even after graduation.

For current students, that might mean joining a structured extracurricular program like Range Club; for others, it might simply mean connecting informally with peers who share similar interests.

"UW's range program is ranked as one of the top in the country, and even on my short tour, I got a feel for the strong sense of community at UW, especially in the College of Ag," says Krepel. "I would recommend they [incoming students] join Range Club...Since it's a conglomeration of upperclassmen and lower classmen, they can often give advice on which classes to take with which professors, in what order, and what are fun elective classes to take."

Range Club also helps students connect with faculty mentors and prepare for competitions organized by the Society for Range Management.

While Burton wasn't significantly involved in the club as a student, he's taken an active role in the Society for Range Management as a working professional. He currently serves as president-elect for the society's Wyoming section and as chair of the Wildlife Habitat Committee at the national level.

Burton especially values the service component of his work, prioritizing opportunities to help rangeland professionals and land managers connect with members of the ranching community through field tours and other events.

"When you get value out of what you're doing, it's less work," he says. "If you like the work you do, it's not work anyways. I think that's my biggest take-home for future students."

To learn more about the REWM Program, visit https://bit.ly/uw-rewm or contact Beck at jlbeck@uwyo.edu. ■

Top: Students in a rangeland ecosystem assessment and monitoring class collect samples for a field lab at the UW McGuire Ranch. Photo by Jeff Beck.

Bottom: Brian Sebade does a quick test for soil pH. Photo by David Keto.

On page 16: Photo by David Keto.

Rainbow Street in Amman.

America Martinez on a camel in Wadi Rum, a desert valley in southern Jordan.

Amman Citadel.

Q&A

UW STUDENT BUILDS COMMUNITY IN AMMAN, JORDAN

interview by **Maya Gilmore**, *University of Wyoming Extension*
photos courtesy of **America Martinez**

In spring 2024, UW student America Martinez traveled to Amman, Jordan. She interned at a local non-governmental organization called Liwan Youth Space, which provides opportunities for Jordanian youth ages 18 to 35 to develop new skills and build community. Martinez double majored in international studies and family and consumer sciences, with a minor in Arabic language and culture. She graduated from UW in May 2024.

Note: The following interview has been edited for length and clarity.

Tell me a little about your background. How did you choose family and consumer sciences (FCS) at UW?

I've always wanted to work in nonprofits and research—improve access to STEM for girls, for example, or improve unemployment rates.

When I was growing up, I loved teaching, but I didn't want to be a teacher full time. The opportunity came up for me to work with FCS, working with families outside of the classroom. I really liked FCS and the opportunity to see how we could help families outside of the educational sphere.

Ironically, I'm a teacher now. I'm working as a full-time fifth grade English language arts teacher in Pueblo through an online teaching licensure and master's program called Relay Graduate School of Education. I'm using this experience as a way to enrich my journey and work with different communities and their unique challenges.

What inspired you to pursue this particular internship?

The Middle East is a niche area that's not often explored at UW, but I took Arabic freshman year and fell in love with the culture and the language. I had a really fortunate opportunity to be the social media coordinator and then program coordinator in the Arabic and Middle East North Africa studies program housed in the School of Politics, Public Affairs and International Studies.

If I wanted to work with an international non-governmental organization, I needed to work in the Middle East and North Africa region and practice the language. It was to my benefit to have firsthand experience living and working in the area prior to the launch of my international career.

Describe a little of what your day-to-day routine looked like in this internship.

My supervisor thought it would be good for me to bounce from department to department within Liwan, so I got a chance to try out different tasks and projects during my time there. I started with accounting and finances—how they organize spreadsheets and reporting for grants.

Then I moved on to the health and nutrition unit, where their project was looking at online gender-based violence and digital justice in Jordan. After Ramadan, the students came together and filmed videos about gender-based violence in their communities. A lot of that was just cultural exchange, language exchange—I'd share about myself and they'd share about themselves.

In the economic empowerment unit, I gathered information about certain issues in the Jordanian community, looking at a lot of reports and statistics. Jordan's unemployment [rate] is really high, especially for students with a four-year degree, and there's a cultural stigma against

trade jobs, so I was also comparing unemployment rates for different divisions.

Which of these units did you connect to the most?

The economic empowerment was the biggest one for me. I thought it was the one I'd like least, but I actually really liked it because you could see the tangible results. It was a stark reality to see—you just spent many years in graduate school and can't get a job because there's just not enough employment opportunities.

We partnered with a telecommunications program that offered participants internships and pushed entrepreneurship and asset-based initiatives. Several workshop participants happened to have a disability and shared the effectiveness and impact of the workshop on their self-efficacy. Those testimonials were really impactful to me.

What surprised you most?

The work-life balance is very different in Jordan than in the U.S. It's both good and bad, I think. In the U.S., there's high values of meritocracy; you work for your money and your success. People clock in at 8 and leave at 5. In Amman, people would leave early, but still meet job outcomes; everyone helps each other out and you're a team.

Sometimes it was a bit of a challenge for me; it was like, "I want to do more though." I went [to Amman] during Ramadan, and work hours are cut—we were working from 10 to 3, some people were leaving a little early, streets are empty during the day. It's a huge shift.

But after Ramadan, we hit the ground running. In the filmmaker workshop, the youth got the foundational knowledge before Ramadan, then afterwards they had the knowledge they needed to start filming and writing scripts.

Were there any parts of Amman that reminded you of Wyoming?

Yeah, we always joke about this! The hospitality in Wyoming is just like hospitality in the Middle East. Rural living is tough, and because of that we really build bonds, we rally together. That's how the Middle East community operates as well. It's all about taking care of each other, supporting each other.

They're not just welcoming you in for a meal, they care about your safety and wellbeing so much; they care about what you have for breakfast, that you feel safe, that you're warm enough at night, that you're not hungry.

What was your biggest takeaway from the trip?

I went for a couple of reasons—to practice Arabic, work at an NGO, and experience a culture. It was also a trial run to see if I could enjoy living and working abroad.

My biggest takeaway is that international development, NGO work, and international aid are all very tricky and complicated. I'm conflicted about how the world of international aid operates and how these countries are delivering these programs. Are we actually empowering these communities, is giving this aid fixing the problems?

Liwan understood the barriers and challenges of their own communities and talked to communities to see what they really needed. I'm sure no international company wants to fund $10,000 to teach people about resumes, but these are fundamentals. There's a lot to learn about what strengths communities have. They're very capable and creative in how they can approach problems already.

Did your experience in Jordan inform the way you're approaching your current internship as a teacher in Pueblo?

Yeah, I think so. I would say being well traveled, understanding different cultures, helped me recognize everyone will have different skills and assets in a classroom, rather than operating from a deficit-based mentality.

In Jordan, people are unemployed, but how can we recognize what skills they have to improve their employability? I'm working in a Title 1 school now, which means the school receives federal funding to support students from low-income families, aiming to improve academic achievement and provide a high-quality education. How can we empower students to see the strengths they have and take control of their learning?

Is there anything else you'd like to add?

Especially in today's political climate, there's definitely fear of going to the Middle East as an American and what that means for you. I just want to reiterate that I had a phenomenal experience. There were ups and downs, but I got really close with my host family, I made some amazing friendships, and I'm trying to go back next summer.

I'd just encourage people to get out there. Explore the world, don't be afraid! There's a lot that can be learned by pushing yourself out of your box, your comfort zone, and Wyoming. ■

America Martinez in front of Petra, a historical site.

A mosque in Aqaba, a city in southern Jordan.

King Abdullah I Mosque in Amman.

UW ALUM & FACULTY LEAD U.S. ARMY TRAINING IN SCOTLAND

written by **Brooke Ortel**, *University of Wyoming Extension*
Photos courtesy of **Derek Scasta** *and* **Whit Stewart**

Major Craig Calkins is the senior U.S. Army veterinarian for all of southern Europe, serving as the deputy commander for Veterinary Readiness Activity, Italy. But, 12 years into a decorated military career, Calkins still considers himself a Wyoming kid determined to find his way home. In the meantime, he's managed to do the next best thing: bring Wyoming resources abroad. Recently, that meant collaborating with two University of Wyoming faculty members to lead a livestock handling training for U.S. soldiers in Scotland.

Above: Soldiers practicing methods for assessing fecal samples and examining indicators of anemia and internal parasite infestation at the SRUC Hill & Mountain Research Centre near Crianlarich, Scotland.

On page 21: Demonstration of gathering sheep from extensive pastures using herding dogs and a shepherd at the SRUC Hill & Mountain Research Centre near Crianlarich, Scotland.

BUCKING CONVENTION

Calkins joined the Army as a veterinarian in 2012. When it came time to further his military career through specialized training, he chose an unconventional path: pursuing a rangeland ecology and watershed management degree at UW.

Having grown up in Wyoming, Calkins recognized the importance of understanding and managing agricultural land and livestock. Besides, after deploying to Kuwait, Iraq, Jordan, and Qatar, he was eager to return to his home state.

WHY WORK WITH LIVESTOCK?

During his time in the military, Major Calkins had observed that many Army veterinarians and animal care specialists, while accustomed to handling military working dogs, lacked experience with large animals like sheep and cattle. In 2022, he decided it was time to explore training options for U.S. soldiers under his tutelage.

He knew exactly who to ask for assistance: his UW graduate advisor, rangeland management specialist Derek Scasta, and Whit Stewart, UW Extension sheep specialist.

It wasn't the first time that Calkins had arranged for the Army Veterinary Corps to work livestock with UW faculty. In 2019, when he began his graduate research in rangeland ecology, Calkins recruited the 438th Medical Detachment (Veterinary Service Support) from Fort Carson, Colorado, to help draw blood from UW cattle.

The purpose of his research was to analyze how factors like blood-clotting times, hide thickness, elevation, and environmental conditions affect hornfly parasitism. These insects are the most economically damaging external parasite of cattle in the U.S., and the project meshed well with Calkins' veterinary experience and interest in livestock production.

It turns out that collecting baseline data for his research project was also a key learning experience for the 438th Medical Detachment. In other settings, Calkins had noticed that by the time a group of soldiers got comfortable

working with large animals, it was time to pack up and head home. Not so at the Laramie Research and Extension Center. There, the sheer volume and repetition associated with collecting hundreds of blood samples and running hundreds of ultrasounds proved to be an invaluable training exercise.

That's not the only advantage of working with large agricultural animals, Calkins says. For example, physical examinations of cattle and sheep provide an opportunity for soldiers to detect and treat internal parasites. That's an experience they might not have in a clinic that primarily sees military working dogs and service members' pets, which receive monthly preventatives.

"I genuinely believe that working with agricultural animals—large animals—is the recipe for success for building competencies in the small animal clinic," Calkins concludes.

INTERNATIONAL RELEVANCE

In addition to honing translatable veterinary skills, familiarity with livestock and agricultural systems may benefit soldiers serving in international conflict zones, whether to help sustain their units or provide humanitarian aid. "As we continue to shift from counterinsurgency operations to large-scale combat operations, vet services need to be familiar with livestock operations," says Calkins.

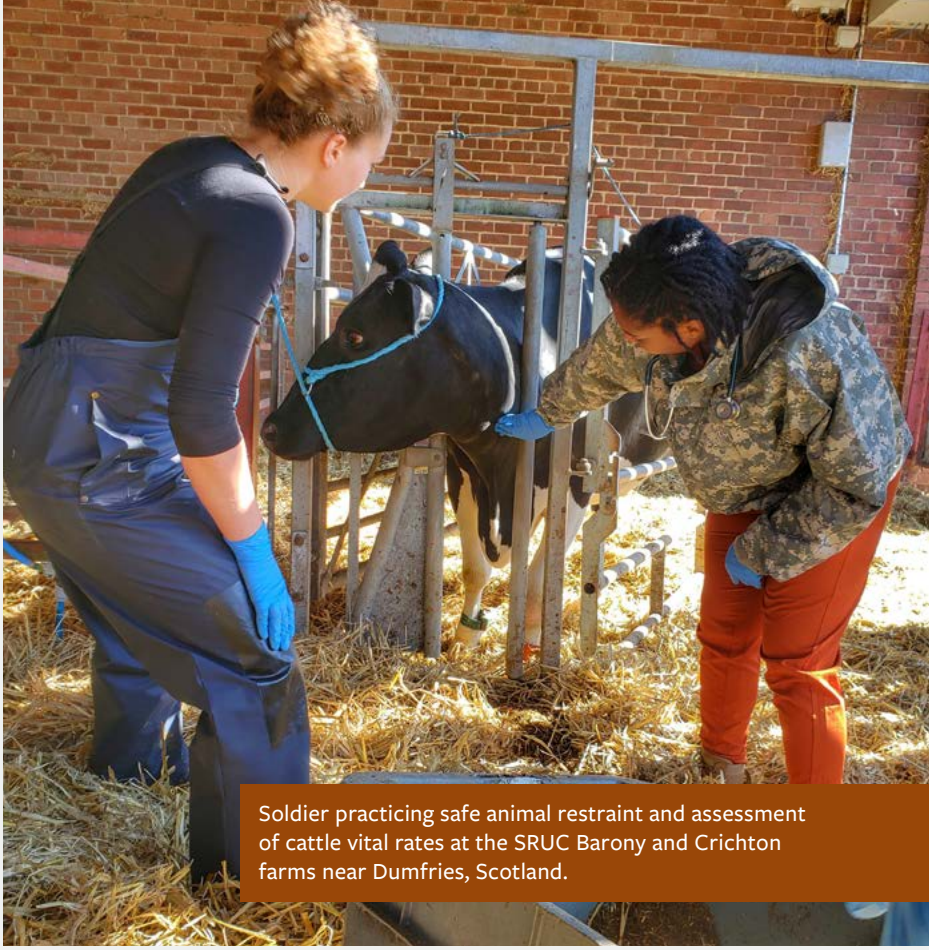
For example, soldiers deployed to eastern Europe might be tasked with procuring sheep to feed their division, Stewart explains. That might require building a temporary corral, purchasing sheep, moving the animals, and coordinating with a local harvest facility.

But, in order to successfully complete such tasks, the soldiers would need to understand the basics of livestock handling and care.

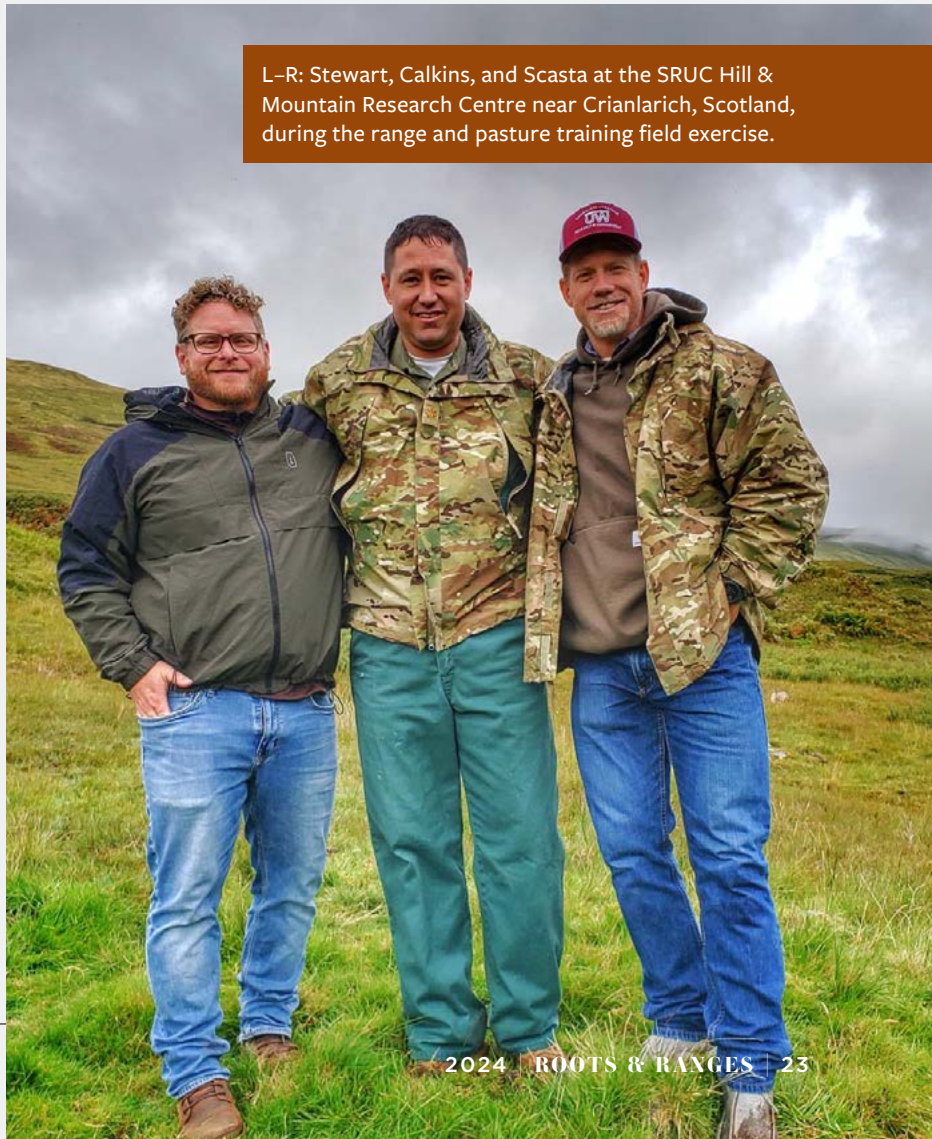
CIVILIAN SERVICE

That's where Stewart and Scasta came in. After some brainstorming about potential partners, they reached out to Scotland's Rural College (SRUC) in Edinburgh to arrange a training in August 2022. In cooperation with SRUC faculty and staff, Calkins and the two UW Extension specialists developed a multi-day educational program for 33 U.S. Army soldiers stationed in Italy, the United Kingdom, Germany, Turkey, and Spain.

"I brought all these subject matter experts with me instead of being a jack of all trades, master of none. I think that was the key to success," Calkins reflects. "Whit and Derek are



Soldier practicing safe animal restraint and assessment of cattle vital rates at the SRUC Barony and Crichton farms near Dumfries, Scotland.



L–R: Stewart, Calkins, and Scasta at the SRUC Hill & Mountain Research Centre near Crianlarich, Scotland, during the range and pasture training field exercise.

Stewart sorting lambs at the SRUC Hill & Mountain Research Centre near Crianlarich, Scotland, for soldier small group training activities.

Soldiers gathering 15 dairy heifers from a pasture and moving them through a gate and down a lane at the SRUC Barony and Crichton farms near Dumfries, Scotland.

teachers—they can get messages across and work well with different learning styles."

The hands-on training, which focused on handling, caring for, and physically evaluating sheep and dairy cattle, took place at SRUC's Hill & Mountain Research Centre in the Scottish Highlands.

"It brought in all three parts of the land-grant university—extension, research, and teaching," says Scasta. "The patriotism of supporting soldiers is pretty cool, and it's a bit of an unusual opportunity. These soldiers are abroad sacrificing time with family, sometimes in very difficult places, to try to help provide stability and food security globally."

THE FIRST TRAINING OF ITS KIND

The Scotland training was designed primarily for animal care specialists, Army personnel who serve as veterinary technicians. In addition to caring for military dogs, animal care specialists must demonstrate competency in livestock-specific tasks.

Veterinarians, animal care specialists, and veterinary food inspection specialists are also responsible for food and feed inspections, ensuring that local manufacturers meet U.S. military standards. Calkins worked with UW and SRUC to ensure that the training addressed these topics and/or directly translated into working with military dogs.

During their time at SRUC, the soldiers spent two days working with sheep; on the third day, they visited SRUC's teaching dairy, where they learned to handle and milk cows. "It was really intentional to facilitate hands-on learning," Scasta explains. "We didn't want to just be in a classroom and lecture these folks."

The instructors took what Stewart describes as a holistic approach, complementing animal handling exercises with case studies and prompting soldiers to consider livestock care as part of a larger integrated system.

"We got to work with armed forces, which is special to begin with," he says. "Even cooler, we got to teach them about livestock stakeholders worldwide—how they sustain rural communities and why it's important to know how to feed and care for these animals."

He and Scasta started by discussing how environmental factors can affect an animal's health. Next, they segued into how to safely handle large animals, keeping in mind that some soldiers had never interacted with livestock before.

Under the guidance of UW and SRUC instructors, the soldiers also performed physical examinations, focusing on how to take basic vitals and recognize common issues in feet, eyes, ears, and udders. Next, they practiced specific diagnostic techniques, such as using microscopes to inspect fecal samples for parasites.

For some participants, particularly veterinarians, the content was familiar; for others, getting in a pen or stall was a completely new experience. "We were teaching soldiers [and noncommissioned officers] that may not have a college degree or any level of post-secondary education, clear up to veterinarians. We integrated everybody's knowledge," says Stewart.

LEADERSHIP LESSONS

The training was a valuable learning experience not just for the soldiers, but also for the UW faculty members. "I really appreciated teaching a diverse set of stakeholders that had different baselines," Stewart reflects. "It absolutely has enhanced how I teach in the classroom and with producers and extension people."

The two UW educators were also impressed with the high standards for leadership and accountability upheld by soldiers of all ranks, from technicians to senior veterinarians like Calkins. "Leadership is at the forefront of everything they do," says Scasta. "They facilitate constructive criticism at all levels but also hold high expectations within ranks. I think there's a lot the academic institution can learn in that regard."

Both he and Stewart were especially struck by the value of after-action reviews, structured discussions about each day's successes and challenges. "That's the beauty of the Army model," says Stewart. "Every edition is iterative and we get better as we go."

Based on pre- and post-evaluation feedback from participants, the training was a success. In recognition of their contributions, Scasta and Stewart were each honored with a civilian service award from the U.S. Army.

"They seemed to value having university ag folks there," Scasta comments. "I see a lot of potential for synergy and collaboration."

CONTINUING THE COLLABORATION

Inspired by the success of the Scotland training, Calkins and the UW team are considering hosting a similar program in Laramie.

Coordinating international logistics is no small feat, but UW has a lot to offer when it comes to livestock handling and care. While SRUC provided an excellent venue and

Above: Scasta and Stewart receiving Public Service Commendation Medals from the U.S. Department of the Army.

On page 27: Range and pasture ecology and management training at the SRUC Hill & Mountain Research Centre near Crianlarich, Scotland, including teaching about types of plants, poisonous plants, and animal distribution.

co-instructors, due to licensing requirements, the soldiers were unable to perform blood tests on the livestock they handled. Hosting a similar training in Wyoming would allow soldiers to practice this key skill, potentially with hundreds of animals.

In addition to the facilities at the Laramie Research and Extension Center, the UW Meat Lab would provide an opportunity for soldiers to learn firsthand about meat processing.

> "I think you can leave Wyoming, but Wyoming will always be with you. There's always a resource I can reach back to and they'll pull through."

UNIQUELY WYOMING

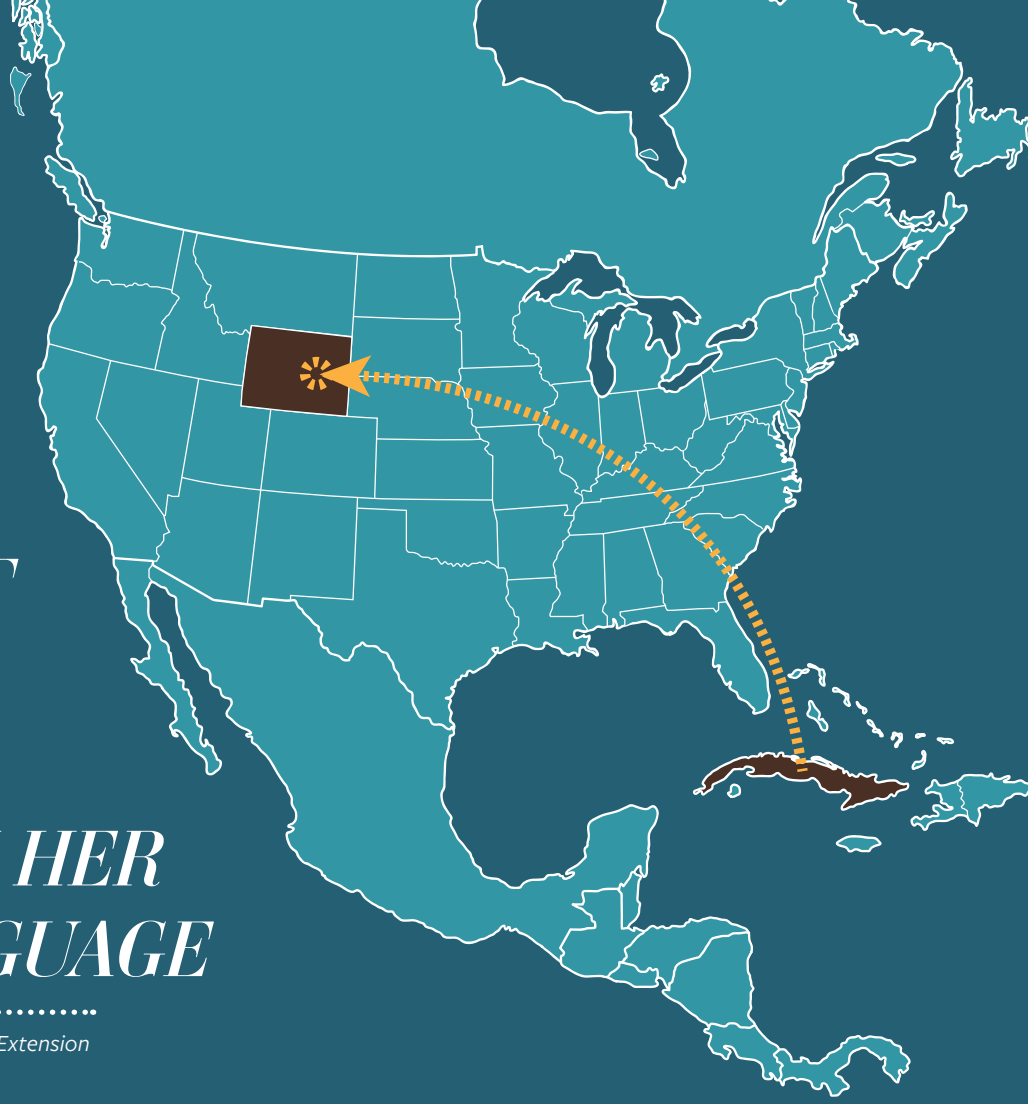
Regardless of what the next training might look like—or where it might be held—the program in Scotland forged a unique and mutually beneficial relationship between the U.S. Army and the University of Wyoming.

"For Craig to reach out and invite us and recognize we could do something special in a very unique Wyoming way—I think that speaks to one of the things we're good at here at UW," says Stewart. "We can make things happen."

It's also a testament to Major Calkins, he and Scasta agree. Whether moving cattle at the Laramie R&E Center or handling sheep in Scotland, their former student consistently models discipline, integrity, and a good-natured willingness to do what needs to be done.

"I think Wyoming should be really proud of someone like Craig," Scasta comments. "He's the best of Wyoming in many ways."

As for Calkins, Wyoming will always be home. "I will never forget where I'm from and what the state has provided me," he says. "I think you can leave Wyoming, but Wyoming will always be with you. There's always a resource I can reach back to and they'll pull through." ■



FROM CUBA TO CASPER: *UW STUDENT EXCELS IN BIOMEDICAL RESEARCH IN HER SECOND LANGUAGE*

written by ***Brooke Ortel****, University of Wyoming Extension*

Chavely Cruz Cárdenas

graduated from the University of Wyoming in May 2024 with a bachelor's degree in biology and a 4.0 GPA. As the student speaker at her commencement ceremony on the UW – Casper campus, she received a standing ovation. Many were moved to tears by her story of navigating the challenges of immigrating to the U.S. while excelling as a student researcher, overcoming countless obstacles to thrive in a new country.

A HAT FULL OF DREAMS

At age 23, Chavely Cruz Cárdenas left her home in Havana, Cuba, to pursue post-secondary education in the U.S. She dreamed of attending medical school and becoming a doctor.

"In 2017, I left my hometown and so much more than that, I left my family and friends," she recalls. "I left with just a small backpack and a hat full of dreams."

After a few months in Florida, she headed west to start a new life in Wyoming, where her grandparents lived. "I wanted to start working, save money, go to school and make friends right away, just have a normal life, but I had to learn to be patient," she shared in her graduation speech. "As a new resident to the country, I had to learn the language as well as about taxes, credit cards, bank accounts, and other stuff. It felt like I was a baby trapped in an adult body."

BRAVING THE LANGUAGE BARRIER

When Cruz Cárdenas first arrived in Wyoming, she struggled to carry on a conversation in English. Looking back, she recognizes that making mistakes was just part of the learning process. At the time, though, she felt anxious and embarrassed.

Before diving into college coursework, Cruz Cárdenas joined the English as a Second Language (ESL) program at the Castellow Adult Learning Center in Casper, where she later volunteered. At the same time, she worked at a local restaurant to help provide for her family.

In 2019, Cruz Cárdenas started taking classes at Casper College—while also working a full-time job and volunteering at the Castellow Adult Learning Center.

It was exhausting. "In Spanish, I had to study, but not with the same intensity because it's my language," she explains. But in the U.S., she had to study in English and Spanish at the same time in order to keep up with her classmates.

"It was not easy working full time and at the same time taking hard core science courses such as physics, chemistry, biochemistry, and genetics in another language. I was always worried about not being at the same level as the rest of my class," she recalls.

In her chemistry notebook, a blend of Spanish, English, and numerals danced across the page. "What is this?" a friend wondered, glancing at her notes. "That's how it works for me right now," Cruz Cárdenas replied.

She'd write her papers in Spanish, then painstakingly translate them into English. It was difficult—not to mention time consuming. Her English vocabulary lagged behind the complex topics she was trying to explain.

In fact, writing in English was such a struggle that math-intensive homework was a relief. Numbers didn't need to be translated. Her physics instructor, noticing her aptitude for mathematics, tried to coax her into majoring in physics instead. But she was determined to continue on her path, no matter how challenging it might be.

A STRAIGHT-A STUDENT

Cruz Cárdenas graduated with distinction from Casper College in 2022, then began taking classes at UW – Casper. She immediately set her sights on her next goal: graduating from UW with a 4.0 GPA. "That was a crazy goal," she says—but she did it.

"I know a grade doesn't define you as a student, because we're human beings, but for me, it was huge because [it meant] getting a straight A in every course in another language," she comments.

It wasn't easy. "At some point, I was feeling so overwhelmed, I wanted to drop out," she says. In addition to taking challenging classes in a language she was still learning, Cruz Cárdenas was the main financial provider for her family in Cuba. Balancing a heavy academic load with a full-time job was a huge stressor, but she couldn't afford not to work. Back in Cuba, her family members struggled to access even basic necessities like food, clothing, and medication.

"In my journey, I had to deal with some people who did not believe in me at all," she said in her graduation speech. "They thought that I was not going to be able to go to school, pursue a degree, and manage work because of the language barrier and aspects of being an immigrant...but at the right time, I met the right people. People who were angels and believed in me the whole time."

One of those angels was her research mentor, Florence Teulé-Finley, who teaches from UW's Casper campus and also serves as coordinator of the Wyoming INBRE (IDeA[1] Networks of Biomedical Research Excellence) program.

Cruz Cárdenas performs an ovariectomy procedure on a mouse. Photo courtesy of Chavely Cruz Cárdenas.

BIOMEDICAL RESEARCH

Funded by the National Institutes of Health, Wyoming INBRE provides opportunities for students at UW and Wyoming community colleges to participate in biomedical research. Through lab experience, competitive internships, and other educational opportunities, the program helps set students up for success in the sciences.

These experiences are especially beneficial for non-traditional students, who might not otherwise have the opportunity to participate in rigorous lab-based research, Teulé-Finley explains. "It's about training in the scientific process, setting up experiments, collecting data, analyzing data, and reporting," she says. "We try to involve as many students who are interested as possible."

For Cruz Cárdenas, the INBRE program was a great source of hands-on experience in a lab setting, allowing her to design and conduct her own experiments. She loved seeing the real-world relevance of what she'd learned in the classroom. While other students complained about taking chemistry and math, Cruz Cárdenas quickly realized how valuable those courses were in lab. Adding chemicals in the correct order

1 The IDeA, or Institutional Development Award, program was established in 1993 by the National Institutes of Health as a means to support biomedical research. The IDeA Networks of Biomedical Research Excellence (INBRE) Program supports statewide biomedical research developments in IDeA-eligible states, including Wyoming (#5P20GM103432).

In April 2024, Cruz Cárdenas presented her research at an INBRE conference in Laramie. She was the first author of this research poster. Photo courtesy of Chavely Cruz Cárdenas.

or calculating concentrations properly really did matter, and it was gratifying to see what happened when she got it right.

"I love science," she says, smiling. "Since I was a kid, I remember I was always playing like a scientist. I was stealing stuff from the kitchen—oil, water—doing my own experiments."

Under Teulé-Finley's mentorship, Cruz Cárdenas not only learned valuable laboratory skills, but also contributed to two research projects in collaboration with UW faculty. "I also like Florence's style, the way she teaches you is amazing—she really makes you love lab," Cruz Cárdenas says. "Florence trained you to do things by yourself. You don't depend on her the whole time. I liked that because when you're working, you have to depend on yourself."

Her first project in Teulé-Finley's lab, which examined the female reproductive cycle, was a collaborative effort spearheaded by UW faculty member Amy Navratil. The project focused on better understanding ovulation in mice, a process that involves cellular components known as microtubules. Cruz Cárdenas and her lab mates in Casper contributed to the project by genetically engineering a recombinant vector, a DNA molecule modified to contain and transport specific genetic information. This recombinant vector allowed Navratil's team in Laramie to track microtubule movements in mice. At the conclusion of the project, Cruz Cárdenas presented her team's research poster at a regional conference in New Mexico.

In her second research project with Teulé-Finley's group, Cruz Cárdenas joined a collaboration led by Laramie-based faculty members Danielle Bruns and Brian Cherrington. This research focused on understanding how, at the molecular level, heart aging differs in males versus females and how those differences impact cardiovascular risks in the two sexes.

Cruz Cárdenas was first author on the research poster associated with the project, skillfully communicating science in a language she'd struggled to learn just a few years before.

LIMITLESS OPPORTUNITIES

Like Cruz Cárdenas, Teulé-Finley immigrated to the U.S. in her twenties to pursue educational opportunities. Originally from France, she earned a PhD in genetics at Clemson University. While they came from different countries and backgrounds, Teulé-Finley could relate to the challenges Cruz Cárdenas faced in pursuing higher education in another language.

"She came here as a non-native [too]," says Teulé-Finley, who joined UW as a research scientist in 2003. "She's a non-traditional student and has had to deal with a lot. I told her, 'As a foreigner, you're going to have to be better than anyone else. That's how it is.'"

It's a high standard, but Cruz Cárdenas is more than equal to the challenge. Despite the obstacles she's faced throughout her educational journey, Teulé-Finley says that "Chavely always has a smile on her face, even when she struggles. She never says no, she just gets it done."

After graduating from UW in May, Cruz Cárdenas has continued to work full time as a bilingual family support specialist with the nonprofit Parents as Teachers. While she hopes to attend medical school in the future, she is keeping her options open.

"My journey has been far from perfect—it's been messy, challenging, and at times, downright exhausting," Cruz Cárdenas said at graduation. "But in every setback, I found an opportunity for growth. In every obstacle, I discovered a hidden strength within myself that I never knew existed. For those people who did not believe in me my answer is: 'The sky's my limit.'" ■

Study the flora and fauna of Wyoming—**and the world.**

Do you dream of studying Wyoming's spectacular plants in their native environment? Take the classroom outdoors with UW's botany department.

As a botany student, you'll

- Participate in meaningful research projects in Wyoming and around the world
- Learn about life sciences in the lab, classroom, and field
- Connect the past and present in the Rocky Mountain Herbarium

UW's botany department offers a

- BS in botany
- BS in biology
- MS in botany
- PhD in botany or several interdisciplinary programs

University of Wyoming | College of Agriculture, Life Sciences and Natural Resources
Botany

*Visit **www.uwyo.edu/botany** to learn more.*

ELECTRIC PRESSURE COOKERS KEY TO NEW PROGRAM COMBATING FOOD INSECURITY

written by **Brooke Ortel**, *University of Wyoming Extension*

As an inexpensive, healthy, and shelf-stable source of protein, dry beans are a staple in food pantries. At a glance, they're a great way to improve nutrition and food security.

But dry beans have a downside: they take a long time to cook, especially at high altitudes. "It's one of the least expensive protein-rich foods for pantries to buy and have on their shelves, but it's also often skipped over and left on shelves," explains Kali McCrackin Goodenough, manager of the University of Wyoming Extension's Cent$ible Nutrition Program (CNP).

DEALING WITH DRY BEANS

Funded by the USDA's Supplemental Nutrition Assistance Program - Education (SNAP-Ed) and the Expanded Food and Nutrition Education Program (EFNEP), CNP provides nutrition and physical activity education to Wyoming residents with limited resources.

CNP works with more than 300 partners across the state, including food pantries and other anti-hunger organizations. Many food pantries had shared concerns about the dry beans going unused by their patrons. "We asked what would change that and they said a way to cook the beans faster and more efficiently," says McCrackin Goodenough.

Participants in CNP classes had also expressed apprehension about cooking with dry beans. "Having conversations with participants, they mentioned they didn't know how to make beans, or it takes a really long time," recalls Cristina Terry, a CNP educator based in Natrona County.

In 2022, CNP staff launched a new statewide project, "Under Pressure," in response to the needs articulated by their partners and participants. Through this project, once participants complete CNP's standard eight-lesson curriculum, they are eligible to take an additional lesson on how to cook with an electric pressure cooker.

CNP staff also secured external grants to purchase electric pressure cookers for participants who successfully complete the "Under Pressure" lesson. Funders include Wyoming Hunger Initiative, Farm Credit Services of America, and the John P. Ellbogen Foundation.

HOW ELECTRIC PRESSURE COOKERS CAN HELP

Electric pressure cookers can help improve both nutrition and food security. "I absolutely love it! I'm eating more vegetables and beans too," comments a CNP participant from Natrona County. "It is just so easy."

For food pantry patrons, these devices "provide both a way to cook and a way to use the food sources they have more efficiently," says McCrackin Goodenough.

Electric pressure cookers can be especially useful for people who may not have access to stable housing or are living in transitional housing. The devices are portable and require only electricity, not access to a stove or other appliances that may not be available in all housing situations.

Even if someone has access to a stove, it may not be a safe or economical option, Terry points out. "It takes a lot of courage to go to a food pantry, and if someone is struggling for food, they may be struggling with something else," she says. "Just because we're privileged in being able to turn on the stove and not think twice, some individuals may not be."

For older people or those with a physical disability, electric cookers have an additional

benefit: they significantly reduce the need to stand for long periods of time while prepping and cooking meals.

LAUNCHING THE COURSE

Once electric pressure cookers were identified as a potential way to encourage dry bean consumption, the CNP team began developing a lesson and recipe booklet for the project.

CNP's typical adult curriculum includes a series of eight hands-on lessons, each about an hour and a half, on food safety, nutrition, and cooking on a budget. The new electric pressure cooker class added a ninth lesson to the mix, an optional addition for CNP participants who have completed the initial eight lessons.

Staff from across the state pitched in to test and compile recipes for the "Under Pressure" project. They also created a series of videos and other online resources that participants could revisit after completing an in-person class.

"Educating our participants on all aspects of pressure cooking became a big project for educators around the state," recalls Wendy Nielson, an educator in Sweetwater County. "To help our participants choose and use these wonderful, nutritious beans...we needed to create a new lesson with the objective of safe cooking and motivation to use the appliance regularly."

A SUCCESS STORY

While land-grant universities in other states have provided resources for using electric pressure cookers, CNP's approach is unique. "Our program takes the perspective of food security versus just 'how do you cook in an electric pressure cooker,'" McCrackin Goodenough explains.

In 2023, more than 170 people participated in CNP's "Under Pressure" class. Before completing the class, less than 3 percent of participants reported using an electric pressure cooker to cook dry beans, peas, or lentils; 3 months (or more) after the program, the number had jumped to nearly 85 percent..

Through exit surveys and conversations with participants, CNP educators have received resoundingly positive feedback on the new program.

"I absolutely love it. It is so easy to just put everything in one pot," comments a CNP

Above: L–R: Tammy Ware, Julie Hampton-Lyon, and Crystal Zerbe get familiar with using an electric pressure cooker during a training to prepare CNP educators for teaching the new "Under Pressure" lesson. Photo by Kali McCrackin Goodenough.

On page 32: Tacos made with fish cooked in an electric pressure cooker. Photo by Kali McCrackin Goodenough.

graduate in Natrona County. "I'm eating better and feeling better. I'm eating more vegetables, too...Every time I cook in it, I invite all my friends over!"

Another participant, who serves as the primary cook for his multi-generational family, says the electric pressure cooker has saved a lot of time. "His family couldn't believe how fast the beans cooked," comments Billie Spoonhunter, a CNP educator on the Wind River Indian Reservation.

The electric pressure cookers have even inspired participants who were previously reluctant to cook at all, reports Mary Evans, a CNP educator serving Converse and Platte Counties. "Almost daily, she [a CNP graduate] is posting something she cooked in the electric pressure cooker and shared with her coworkers. This is a young lady who hated to cook and now loves it and tells people how much she learned in the class."

Another couple "indicated that they use the electric pressure cooker frequently and that it has been a lifesaver," says Evans. "[One participant] was not a cook before this class and has taken up cooking with the use of the electric pressure cooker."

SHARING RESOURCES WITH A WIDER AUDIENCE

While the new class was originally designed as a resource for Wyomingites facing food insecurity, the CNP team quickly realized that the course materials would benefit any high-altitude cooks looking to prepare healthy, budget-friendly meals.

UW Extension now offers a free, online version of CNP's "Under Pressure" class. While members of the general public are not eligible to receive a free electric pressure cooker upon completion of the course, they are encouraged to check out the recipes, food safety tips, and videos on how to use the device. "Using an electric pressure cooker can be a little intimidating at first," says Nielson. "The information that is taught in the class is a great resource for folks wanting to learn how to safely use it."

The self-paced class, which is approximately an hour long, familiarizes users with the components and settings of an electric pressure cooker as well as how to adjust recipes for higher altitude locations. "It's tailored to people who haven't used an electric pressure cooker before, but also to the realities of living and cooking in Wyoming," McCrackin Goodenough explains.

To access the course, visit https://bit.ly/uw-electric-pressure-cooker. ■

BLACK BEAN SOUP
(ELECTRIC PRESSURE COOKER)

6 CUPS | 6 SERVINGS

INGREDIENTS

- 2 cups dry black beans, rinsed
- 8 cups water
- 1 tablespoon oil
- ½ cup onion, chopped
- 1 clove garlic, minced
- 1 10-ounce can tomatoes and green chiles
- 2 cups low-sodium broth
- 2 teaspoons taco seasoning
- Juice of 1 lime
- Salt and pepper to taste
- ***Optional toppings:*** low-fat sour cream, low-fat shredded cheese, salsa

DIRECTIONS

1. Place beans and water in the pressure cooker. Cook on high pressure for 30 minutes, then quick release the pressure by opening the steam release valve.
2. Drain the water.
3. Partially mash beans with a potato masher or fork. Set aside.
4. Using the sauté setting, cook the onion and garlic in the oil until lightly brown.
5. Add beans, tomatoes and green chiles, broth, and spices.
6. Pressure cook on high for 3 minutes, then quick release the pressure by opening the steam release valve.
7. Add lime juice and salt and pepper to taste. Add toppings.

EAT

Human Nutrition & Food Major

WEAR

Design, Merchandising & Textile Major

GROW

Human Development & Family Sciences Major

FAMILY & CONSUMER SCIENCES

Family and Consumer Sciences integrates the fundamental components of human life—food, shelter, clothing, human relationships, and family—with larger societal systems. Through programs in textiles, apparel, and design; food and nutrition; and human development and family sciences, our department prepares learners to meet the opportunities and challenges of today's complex world.

Learn more at

UNIVERSITY OF WYOMING | College of Agriculture, Life Sciences and Natural Resources

fam-consci@uwyo.edu

OUT OF THE CLASSROOM, INTO THE FIELD:

UW RESEARCH & EXTENSION CENTER INTRODUCES FOURTH GRADERS TO AG

written by **Maya Gilmore**, *University of Wyoming Extension*

In 2023, Platte and Goshen County fourth graders had a special opportunity: for the first time, a UW research and extension center hosted Goshen County's annual agricultural exposition.

The ag expo aims to give students hands-on experience with agricultural production and natural resources. "Even though we're in one of the top agricultural counties of the whole state, it's amazing how many kids haven't dug up a potato, or pet a calf, or even know where potatoes come from," says Kelly Greenwald, administrative assistant at UW's James C. Hageman Sustainable Agriculture Research and Extension Center (SAREC) near Lingle. "Our desire was to physically get the students out of the classroom and into the field."

In the past, SAREC staff organized fourth grade class tours in September. These tours included a field stop where students had a chance to dig up their own bag of potatoes. "We thought it would be the perfect combination of learning opportunities to combine the ag expo and the potato dig into a full day of exposing students to agriculture," says Steve Paisley, director of SAREC.

For years, the Goshen County ag expo was organized by the Goshen County conservation districts and the Goshen CattleWomen. In 2023, volunteers from the National Resources Conservation Service, the CattleWomen, local conservation districts, Goshen County Extension, the Goshen County community, and UW faculty helped SAREC put on the expo.

Katrina Gifford, a teacher at LaGrange Elementary, attended the expo when she was in fourth grade herself. She found that this version of the event was more hands-on and more accessible for students who didn't have much experience with agriculture.

Under the supervision of experts from around the state, students participated in ag-related demonstrations, from catching bugs at the entomology station to using a branding iron on wood.

"I think another benefit to it is maybe potentially get them excited about science or potential career paths," says Greenwald, one of

the SAREC expo’s main organizers. “You never know when you might turn that lightbulb on for a young person.”

At the agronomy station, the fourth graders learned about the life cycle of common plants and their byproducts, such as peanuts and peanut butter or cotton and cotton balls. Gifford’s students were particularly amazed that the kind of sugar found at the grocery store could be made from sugar beets. “That was a big hit,” Gifford comments. “Everyone just wants to eat sugar beets now.”

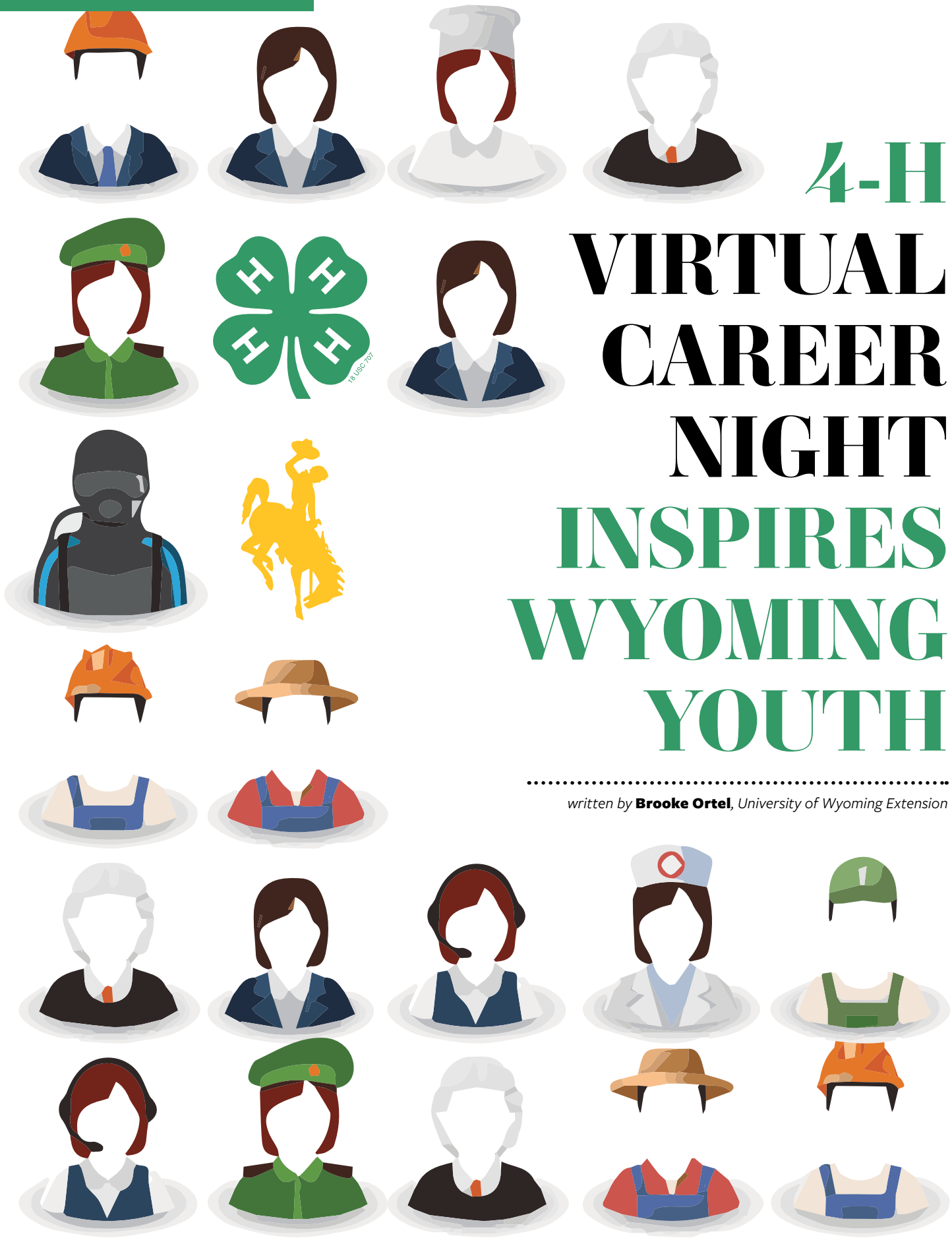
Tennille Grosz, a teacher at Southeast Elementary in Yoder, found that her classroom lit up after attending the expo. “They’ve been asking a lot of questions about the soil and what kind of crops to grow during our Oregon Trail unit,” she says. “A couple of my little guys put together a little business plan, they’re growing potatoes within the home now—they want to be potato farmers!”

Gifford says that her students report seeing natural resources that they learned about at the ag expo around town or when they travel. In particular, they’re noticing corn fields and sugar beets in a new way.

Meanwhile, only a few weeks after hosting the first ag expo, Greenwald was already thinking about 2024. “I’m looking forward to tweaking it a bit, getting next year’s fourth years out here and giving them a good experience,” she says. “I’m just excited to keep it going.” ■

Above: Fourth grade students learn how to sample for insects during the fall 2023 Goshen County ag expo. Photo by David Keto.

On page 36: Fourth graders visit a series of interactive stations during the 2023 ag expo at SAREC. Photo by David Keto.



4-H VIRTUAL CAREER NIGHT INSPIRES WYOMING YOUTH

written by **Brooke Ortel**, *University of Wyoming Extension*

In 2021, the COVID-19 pandemic threatened to disrupt Washakie County's annual career fair for local youth.

But 4-H educator Amber Armajo wasn't about to let that happen. Despite the logistical challenges, she knew she had to find a way to host the event, even if it meant dreaming up a totally new approach.

In her years of organizing in-person career fairs, Armajo had received overwhelmingly positive feedback from participants. A family from Hot Springs County, for instance, credited the fair with inspiring their son to pursue a successful career as an electrician.

Thanks to Armajo's hard work and creativity, the 2021 event was presented in an innovative new format. Rather than requiring participants to travel to Washakie County, Armajo launched Wyoming 4-H's first virtual career night.

"We can't always bring people to Worland, but we can bring them online," she explains. "In small town, rural Wyoming we don't always know what's out there as far as careers. This is a great opportunity to explore."

Hosted via Zoom, the now-annual online event offers an opportunity for young people to interact with successful professionals in fields ranging from agriculture, firefighting, and wildlife management to video production, tourism, and exercise physiology.

"Virtual career night opened my eyes to the many jobs that are out there," says Trenton Robbins, a Washakie County 4-H member. "It is easier to choose a job that you want to do when you can interact with those who have done or are doing those jobs. Whether you are getting ready for college or just starting 4-H, this interactive program is a great learning opportunity for all ages."

Armajo does her best to feature a variety of careers in the trades as well as those requiring higher education. In the past four years, she has recruited an impressive variety of speakers from Wyoming and across the country—including a zookeeper, scuba diver, leatherwork designer, auctioneer, graphic designer, jet engine mechanic, and many others. "People are usually very excited and willing to share, especially for kids," she comments.

While Armajo and colleagues in Wyoming 4-H are responsible for organizing the fair, the event is free and open to any youth who are interested in participating. In 2024, 240 participants from 26 states registered for virtual career night.

"There were lots of different career people there," says Miranda Smith, a Niobrara County 4-H member. "I really liked how you could pick out which careers you were interested in and go to those certain [Zoom] breakout rooms to learn about them."

Rather than become complacent, Armajo has continued to experiment with the event's structure and reach out to new speakers. "I always like to think big," she says. "It's a whole new group of presenters and we also try to do different topics every year."

She doesn't hesitate to leverage connections—or make new ones—with potential presenters both nearby and farther away.

In 2023, she recruited Ryan "Cal" Callaghan of the MeatEater podcast and Netflix series; in 2024, YouTube personality and agricultural professional Greg Peterson of the Peterson Farm Brothers joined the event.

"When we first started, we wanted to show kids what's available in Wyoming, but we've realized it's important to broaden the scope. Sometimes they only see what's available in their hometowns, or in the state, and I think it's fun for them to broaden the horizons and see what's out there," Armajo explains.

In addition to featured speakers from across the country, she has also recruited representatives from Wyoming community colleges, a scholarship coordinator based in Riverton, and a recent college graduate from Lusk who offered the audience a peer-to-peer perspective.

Each presentation is typically about 15 minutes, and Armajo makes sure to allow time for students to ask questions. She also records each session, with the goal of building an ongoing library of careers for young people to explore at their convenience.

"I think it was well received and the kids did learn from it," she reflects. "I think they learned to be open minded, is what I'm gathering from evaluations. To look at everything and open their eyes to some different careers."

To learn more about the career fair and view recorded presentations, visit https://bit.ly/wy-4h-career-fair. Contact Armajo at amwall@uwyo.edu or (307) 347-3431 with questions. ■

UNIVERSITY OF WYOMING | College of Agriculture, Life Sciences and Natural Resources

AWARDS

Each year, the College of Agriculture, Life Sciences and Natural Resources recognizes exceptional alumni, valued partners, and generous supporters of the college. This year's award recipients are outstanding alumni Craig Calkins and Mark Eisele; outreach partner National Western Stock Show; and legacy awardees Art and Catherine Nicholas of Wagonhound Land & Livestock Company.

OUTSTANDING ALUMNI AWARD: ARMY VETERINARIAN LEVERAGES WYOMING CONNECTIONS TO SERVE SOLDIERS ABROAD

As deputy commander for Veterinary Readiness Activity, Italy, U.S. Army Major Craig Calkins leads an international team that provides public health and veterinary services to more than 46,000 Department of Defense personnel in Italy, Spain, Turkey, and the United Kingdom.

Originally from Cody, Wyoming, Calkins entered the U.S. Army Veterinary Corps in 2012. To fulfill continuing education requirements, he later earned a master's degree in rangeland ecology and watershed management from UW.

In 2022, Calkins partnered with UW faculty to organize a one-of-a-kind animal handling training for U.S. soldiers serving southern Europe. See page 21 to learn more about this unique collaboration.

Craig Calkins

OUTSTANDING ALUMNI AWARD: LIVESTOCK INDUSTRY LEADER SUPPORTS LEARNING OPPORTUNITIES, STEWARDSHIP

Mark Eisele, who graduated from UW in 1982 with a bachelor's in agricultural mechanization, owns and operates King Ranch near Cheyenne. Throughout his career, Eisele has served as a leader in several state and national livestock organizations. These organizations include the Wyoming Stock Growers Association, Wyoming Stock Growers Land Trust, Wyoming Livestock Board, and National Cattlemen's Beef Association (NCBA).

In 2024, Eisele was elected president of the NCBA. As president, Eisele has emphasized sustainable range management and expanding learning opportunities to help a new generation of producers succeed. Eisele is also known for his commitment to land stewardship and natural resource conservation.

Mike Eisele

Catherine and Art Nicholas. Photo courtesy of *The American Quarter Horse Journal*.

LEGACY AWARD: LOCAL RANCHERS EMPOWER WYOMING'S FUTURE LEADERS WITH $2.5 MILLION GIFT

In 2024, Art and Catherine Nicholas, who have owned and operated Wagonhound Land & Livestock Company for more than two decades, donated $2.5 million to UW to create the Wyoming Ranching Excellence Fund. Their generous gift was matched by the Wyoming Legislature, bringing the total up to $5 million.

The Nicholas' gift has enabled UW's innovative Ranch Management and Agricultural Leadership (RMAL) program to continue training the next generation of Wyoming ranchers and agricultural leaders. Launched in 2021, the multidisciplinary program provides opportunities for students to network with producers and gain hands-on experience in Wyoming's agricultural industries. RMAL was first envisioned in 2018 during a UW Partnership Summit held at Wagonhound ranch.

OUTSTANDING PARTNER AWARD: NATIONAL WESTERN STOCK SHOW PROMOTES AGRICULTURAL EDUCATION

The National Western Stock Show (NWSS) is one of the country's largest professional rodeos, annual horse shows, and western trade shows. In 1983, the stock show created the National Western Scholarship Trust to provide scholarships to university students majoring in agricultural disciplines.

Since its launch, the trust has awarded more than $10 million to eligible students. Scholarship recipients must have participated in a NWSS show, whether through livestock judging events, certain 4-H and FFA projects, or interning at NWSS. In partnership with community colleges and universities in Colorado and Wyoming, the trust confers more than 100 scholarships annually to students studying agricultural science, rural medicine, and veterinary medicine.

NATIONAL WESTERN® Stock Show

PRESENTED BY

CommonSpirit

University of Wyoming | College of Agriculture, Life Sciences and Natural Resources
DEPT. 3354, 1000 E. UNIVERSITY AVE.
LARAMIE, WY 82071

Nonprofit Organization
U.S. POSTAGE
PAID