

MacMillan Private Lands Stewardship Program

FALL 2022- SUMMER 2023
PROGRAM UPDATE



A PUBLICATION OF THE

WHITNEY MACMILLAN PRIVATE
LANDS STEWARDSHIP PROGRAM



Dear partners and friends of the program,

I am excited to share this annual program update, summarizing the many achievements of the MacMillan Program from Fall 2022 through Summer 2023. This past year has been the most impactful period since initiation of the program in 2018, marked by significant strides in research and outreach to support the stewardship of private lands in the West and beyond.

One notable accomplishment was a collaboration between researchers in the MacMillan Program and the Western Landowners Alliance. We surveyed farmers and ranchers across six states in the Colorado River Basin to identify the current practices landowners implement to adapt to water shortages. We also used this survey to solicit their perspectives on potential solutions to managing systemic water shortages across the Basin. Our research and outreach on this issue garnered the attention of state and local water managers and multiple media outlets. Insights from this project can inform strategies to proactively address water shortages into the future.

The MacMillan Program also partnered with the Intermountain West Joint Venture to host a workshop that brought together leaders from state Natural Resources Conservation Service (NRCS) offices and leading land trusts in the West. This collaborative effort identified actionable strategies to enhance the pace and scale of agricultural land conservation through the NRCS's ACEP-ALE program, the nation's primary conservation easement funding source. The workshop's outputs contributed to USDA adopting significant changes that will increase the impact of this essential land conservation program, facilitating conservation of open space and working livelihoods across the West.

These initiatives highlight the breadth of issues and meaningful projects the MacMillan Program undertakes – and underscore the essential role that partnerships play in our impactful work. Collaborations have been instrumental to our success, empowering us to tackle complex natural resource challenges and foster positive change.

Amidst these accomplishments, we also welcomed new members to our team while bidding farewell to close colleagues who have embarked on new chapters in their careers. While their departure leaves a void, we are excited to follow their future successes as they become leaders of organizations and agencies doing vital work across the West and beyond. Our new members bring fresh perspectives and enthusiasm that will further advance the MacMillan Private Lands Stewardship Program.

I invite you to learn more about our work in the following pages and look forward to reconnecting with you to explore avenues for further collaboration.

With warm regards,

Drew Bennett

Cover photo by Katie Doyle

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Huge thanks to our partners, collaborators, and supporters that make this work possible!



Philosophy and Approach

Research is most valuable when it informs decisions. It is more likely to be used if those who can use the research play a role in shaping the questions, are part of the process, and understand the implications. The research and outreach of the MacMillan Program is focused on generating knowledge and information that is useable for making decisions related to conserving and managing natural resources. We do this by facilitating collaborations and expertise from across the natural and social sciences and applied fields like finance and law. Through these collaborations, end users play a role in identifying research needs and are often engaged throughout the research process so that results are relevant to their situations.



DECISION ORIENTED

Working with partners to identify knowledge gaps and apply new information



INTERDISCIPLINARY

Integrating diverse perspectives, skillsets, and insights to address complex environmental challenges



ENGAGED

Building relationships to increase credibility, transparency, and relevance



Photo by Callie Berman

Meet the Team

Research Scientists and Post Doctoral Research Associates



DR. HILARY BYERLY FLINT, Senior Research Scientist

Hilary is trained as a behavioral scientist and uses tools from economics and conservation social science to understand how people manage and value the natural environment, especially providing public benefits, like biodiversity and risk mitigation, from private lands. She is currently leading a multi-year USDA-funded program evaluation, which focuses on habitat conservation on private lands in the Greater Yellowstone Ecosystem. She has a PhD in Natural Resources (University of Vermont), an MS in Applied Economics (Cornell University), and a BA in Environmental Studies & International Affairs (University of Colorado, Boulder). Hilary is based in Jackson, WY, where she gets to share the mountains and rivers with her husband, two young kids and dog, Wilma.



CALLIE BERMAN, Post Doctoral Research Associate

Callie is an alumna of the Haub School and graduated from the University of Wyoming in 2015 with a BS in Geology and a BA in International Studies. Callie completed her PhD in Development Studies at the University of Cambridge where she researched the role of culture and historical land use relationships in management practices of sturgeon fisheries in the Caspian Sea. She has worked extensively across the Central Asian region developing the first university Sustainability program in Uzbekistan, conducting research on regional food security strategies, and facilitating diverse exchange opportunities to Central Asia for both young and senior professionals. Callie's passion for global exchange in order to support new ways of thinking and innovative conservation design stems from her diverse international experiences and her work on numerous ranches across the Rocky Mountains and Australia. Working on ranches fostered a deep commitment to the role of place-making for Callie and continues to be an important source of inspiration for her research interests. Callie will be working with the MacMillan Private Lands Stewardship Program to explore how human dimensions come to shape grasslands conservation outcomes across the Great Plains region. In her off time, she hopes to continue riding, running, working the range and learning more about Wyoming, the place she loves most.



TESSA WITTMAN, Research Scientist

Tessa earned her BSc at the University of Wyoming with double majors in wildlife biology, and environment and natural resources with minors in honors, sustainability, and reclamation and restoration ecology. She has worked on endangered species recovery with Wyoming toads, post-wildfire ungulate habitat restoration, community-based ecosystem restoration, and interdisciplinary research on the human dimensions of sagebrush ecosystem management. Her current research is assessing outcomes from programs mitigating acute livestock-wildlife conflict on public lands in the American West. She seeks inclusive, community-driven solutions for conserving and restoring landscapes. When she is not doing science, she is exploring public lands, fishing, and hiking.

Graduate Research Assistants



GRACE CARR, Graduate Research Assistant

Grace is an alumna of the Haub School and graduated from the University of Wyoming in 2020 with a BS in biology and a BS in environmental system science with a concurrent major in environment and natural resources. A Wyoming native, Grace deepened her understanding of multi-use recreation on public lands working for a cattle ranch in northern Wyoming throughout her undergraduate years. After graduating, Grace worked with the Wyoming Game and Fish Department's Access Yes Program to promote hunter and angler public access to private lands using landowner agreements. Grace is now working on completing her master's degree in Environment, Natural Resources and Society focusing on elk habitat contributions across Wyoming's public and private lands.



KATIE DOYLE, Graduate Research Assistant

Katie graduated from Texas Tech University in 2018 with a BS in Natural Resources Management; Wildlife Biology concentration. After graduation, Katie headed West and spent 4 years working for state wildlife agencies in Montana, Idaho, and Texas before returning to school in 2022. Katie is currently pursuing a master's degree in Environment, Natural Resources and Society with UW and is working on a project with the MacMillan Program studying the social dimensions of migration corridor conservation in Wyoming. In her free time, and when Wyoming holds back the wind, Katie enjoys exploring the area through fishing, biking, and snowshoeing.



MAX LEWIS, Graduate Research Assistant

Max graduated from St. Lawrence University in 2016 with a BA in environmental studies and economics. Native to Maine, Max quickly found his way West after finishing his undergraduate degree. A position with the United States Forest Service brought him to southeast Alaska where he became interested in the impacts of land management on fisheries, and aquatic ecosystems. Max's work in Alaska was followed by a year spent working with Trout Unlimited in Missoula, Montana where he completed fisheries and stream ecology research that contributed to ecological restoration projects on private lands. In 2018 Max moved to Jackson, Wyoming where he studied native trout and the habitats that they rely on while working for the Wyoming Game and Fish Department, and Friends of the Teton River. Since fall of 2022 Max has been enrolled in the MS in Environment, Natural Resources & Society program as a member of the McMillan Team. Max's research focuses on informing impactful, voluntary water conservation strategies that provide mutual benefit for basin scale water availability, agricultural water use and ecosystem function.



NITA TALLENT, Graduate Research Assistant

Nita Tallent Ph.D. (pronouns: she/hers) is a retired federal research scientist (US Environmental Protection Agency) and natural resource & environmental law & policy professional (National Park Service, Bureau of Land Management, & Federal Emergency Management Agency). Concurrent with her professional career, Nita is an alumna of the University of Nevada Las Vegas where she earned a Master of Arts in Science and doctorate in biological sciences specializing in plant and invasive species ecology.

Following her federal service Nita has returned to academia (Haub School of Environmental & Natural Resources, University of Wyoming) to earn a MS in Environment, Natural Resources & Society as a member of the MacMillian Lab exploring private land conservation and outdoor recreation.



LUCAS THORSNESS, Graduate Research Assistant

Lucas developed a love for wide open spaces and natural ecosystems growing up in the plains and mountains of southeastern Wyoming. He landed at Montana State University where he got a degree in environmental studies with a minor in GIS, followed by a graduate certificate in GIS from the University of Wyoming. After time spent working in wildland conservation and restoration, a stint with a land trust on Colorado's Front Range led him to a passion for private land conservation. Lucas' primary research in the MacMillan Program focuses on geospatial analyses of water rights in Wyoming's Upper Green River Basin and engaging with stakeholders in that realm. Additionally, Lucas contributes to other research reports, publications, and grants. In his free time, Lucas enjoys cycling, hiking, fishing, and skiing in the beautiful public lands around Laramie.

Undergraduate Research Assistants



JEREMY CHAPPELL, Undergraduate Research Assistant

Growing up amidst the rich landscapes of Wyoming, Jeremy found himself drawn to the convergence of technology and conservation. Despite enjoying modest success in engineering and earning associate degrees in both engineering and mathematics from Northwest College, his passion for environmentalism eventually led him to the University of Wyoming. There, he joined the McNair Scholars Program and conducted a summer research project on emerging technologies in conservation. He is now pursuing a bachelor's degree in environmental systems science, with research interests that include biodiversity and land conservation, climate adaptation, and the intersection of environment and technology. In his free time, Jeremy enjoys gaming, physical training, and going for hikes with friends.



IRIS KURZ, Undergraduate Research Assistant

Iris is an undergraduate student in Environmental Science in the Haub School of Environment of Natural Resources, hoping to eventually pursue a career in environmental law. She is originally from Dallas, TX; but has been loving her time in the mountains so far. Iris has a deep interest in the intersection of environmentalism and the social sciences and is excited to see how the MacMillan Private Lands Program will be able to inform her studies in those fields.

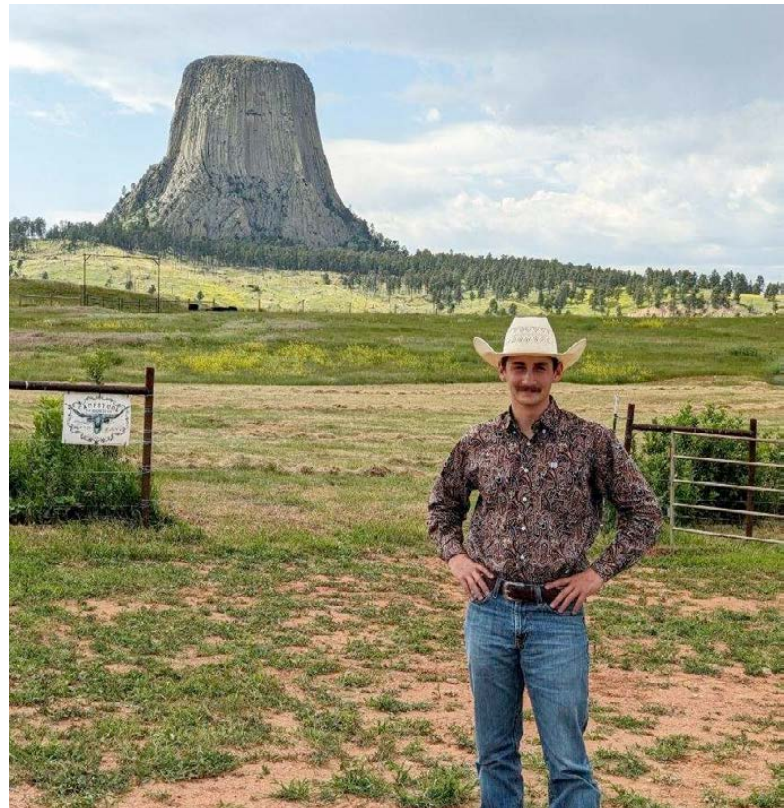
Supported Student Experiences

MAGGIE LANG, 2022 Wyoming Stock Growers Land Trust Stewardship Intern

Interning with WSLGT solidified Maggie's decision to pursue practicing law in rural communities because she directly witnessed how the law impacts the daily activities of farmers and ranchers across Wyoming. Specifically, she saw that Wyoming land symbolizes heritage, inheritance, and cultural identity to many of the landowners who chose to place their multi-generational homestead under conservation easement. WSLGT is striving to preserve tangible property, but how successful the nonprofit is in conserving working land hinges upon elevating and respecting intangible values. WSLGT gave her an opportunity to participate in that conversation about those values with people and communities who are invested in preserving their future livelihoods by recognizing traditions.

GARRETT GWIN, 2023 Wyoming Stock Growers Land Trust Stewardship Intern

Garrett interned with WSGLT where he was the conservation stewardship intern. Over the span of 3 months, Garrett monitored roughly 50 ranches with conservation easements across almost every county in Wyoming. Monitoring consisted of identifying possible violations to the conservation easement's deed and accumulating information for a general report on how each ranch's current condition sits in terms of proper stewardship and conservation. WSGLT provided Garrett with a major highlight to his summer in the form of an opportunity most law student interns don't get - freedom to be outside almost every day! With his desire to become an attorney for ranchers and other agricultural producers, Garrett greatly benefited from meeting the landowners he will be working with in the future and spending time in the environment he hopes to protect.



Garrett Gwin monitors an easement in northeast Wyoming in summer 2023.

JEREMY CHAPPELL, 2023 McNair Scholar

Jeremy joined the MacMillan Program in the summer of 2023 as a McNair Scholar – a program aimed to prepare first generation and other underrepresented college students for the challenges of graduate school through mentorship and research experiences. Upon starting the McNair Program, Jeremy changed his degree program from engineering to environmental systems science and pursued a research project on emerging technologies with the potential to advance the conservation of land and biodiversity. Drew Bennett and Travis Brammer served as mentors for his project, which he presented this summer at a undergraduate research symposium at University of Wyoming. Jeremy will continue with his research project over the academic year and plans to pursue graduate studies in the years ahead.

IRIS KURZ, Monthly Water Supply Report with the Sheridan Community Land Trust

The Sheridan Community Land Trust (SCLT) in Sheridan, Wyoming worked with Iris throughout the spring of 2023 to refine an existing monthly report on the water supply in Sheridan County. Given the importance of agriculture within the county, the amount of water available from headwaters and precipitation is crucial to SCLT members, as well as other citizens of Sheridan. Providing scientific information in an easily accessible way for a varied demographic is one way that a land trust can promote the conservation of natural spaces and resources—especially when it comes to water. As SCLT brings on new interns to focus on how water plays a part in the protection of private lands, the report will continue to grow and evolve to better serve its readers.

Happy Trails!

This past year, team members Travis Brammer, Courtney Garrity, and Wai Yan Siu left the team to take exciting next steps in their careers. Travis spent 4 years as a team member, originally starting as a student research assistant when he began law school with a joint MA in Environment and Natural Resources and transitioned to serving as a Conservation Fellow for the past year. During this time, he was an essential part of several efforts including leading a research project on rangeland carbon credits and helping to organize and facilitate a workshop to increase the impact of the Natural Resource Conservation Service's conservation easement program (featured later in this report). While at the university, he also authored or co-authored several journal and law review articles, one of which won the Law360 Distinguished Legal Writing Award. Travis is now serving as the Conservation Director at the Property and Environment Research Center (PERC) where he will help launch a new Conservation Innovation Lab.



Courtney joined the MacMillan team partway through her graduate degree and graduated in the Spring of 2023 with a concurrent Masters in Zoology and Environment & Natural Resources. In collaboration with her co-advisor Dr. Joe Holbrook and the Holbrook team, her thesis project focused on the management and impact of dispersed camping around Grand Teton National Park. Her extensive fieldwork and data collection are providing important evidence to inform the Bridger-Teton National Forest's campground ambassadors program as a strategy to manage the exponential increase in dispersed camping in the forest in recent years. This experience also provided her with intricate knowledge of the best campsites in the region – making her an exceptional resource for planning your next camping adventure! She began as a Forester/Analyst with the Rocky Mountain Research Station in spring 2023 and is transitioning to a permanent position as a Program Specialist with the US Forest Service on the Pawnee National Grassland. As a testament to their hard work, Travis and Courtney both received the Haub School's Outstanding Graduate Student Award and we could not be more proud of their many accomplishments!



Dr. Wai Yan Siu joined the team as a postdoc in the fall of 2021 in a joint effort with Dr. Jacob Hochard and his conservation economics program. She was critical to the Natural Wealth Accounting project and brought exceptional programming and modeling skills to the effort. During her time at the Haub School, she contributed to several journal articles currently under review including an analysis of the impact of wildlife overpasses across highways on vehicle collisions with elk and deer. Dr. Siu has moved on to a new position as a Data Analyst with the State of Minnesota where she will continue to advance her career analyzing economic data.



We wish Travis, Courtney, and Wai Yan very happy trails in their paths ahead and will greatly miss their comradery and everything they did for the team. We look forward to future collaborations in their new roles and are excited to see all they will achieve as leaders in their fields.

Featured Research Projects

AGRICULTURAL WATER USERS' PREFERENCES FOR ADDRESSING WATER SHORTAGES IN THE COLORADO RIVER BASIN

The Colorado River Basin is in crisis. There is no longer enough water for all of those who depend on it. The agricultural sector is the largest water user in the Colorado River Basin, meaning that farmers and ranchers are central to both the impacts of and solutions to water shortages. Their involvement will be key to developing effective policy solutions to today's water crisis.

We surveyed 1,020 farmers and ranchers throughout six states in the Colorado River Basin to understand their perspectives on the present crisis, their current water conservation practices, and their preferences for strategies to address water shortages going forward. Agricultural water users were primarily concerned about how the current situation could impact water policy, constrain irrigators' own water use, and constrain other agricultural water users (Figure 1).

Perhaps unsurprisingly, we found agricultural water users are already responding to water shortages. Roughly 70% of surveyed agricultural water users have already adopted one or more water conservation practices or adaptation strategies (Figure 2). Importantly,

many would consider adopting additional practices. Despite this, few respondents participated in or were aware of formal programs to support water conservation.

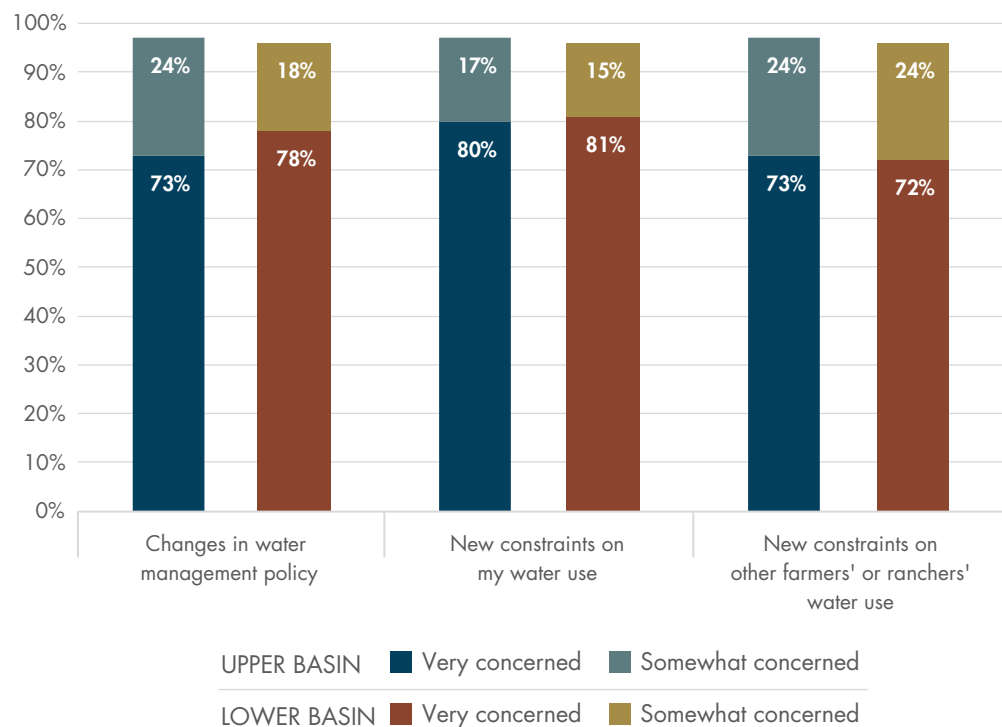
Most survey respondents were unlikely to adopt water conservation practices as part of formal demand management or system conservation programs to address water shortages.

Respondents were also generally opposed to water transfers as a solution to shortages.

Opposition was strongest to permanent transfers broadly, as well as to temporary transfers

from agricultural to non-agricultural uses. Only temporary transfers from agricultural water users to other agricultural water users had less than 50% opposition. Major barriers to supporting water transfers included concerns about losing

Figure 1. Concerns about potential impacts from water shortages in the Basin.



water rights, even in temporary transfer arrangements, as well as insufficient financial compensation. Addressing these concerns will be critical to increase participation of agricultural water users in demand management or system conservation. Still, although support for temporary water transfers and demand management practices was low, even equivalently low participation (e.g., 10% to 20%) could help address water shortages as part of a portfolio of strategies for the Colorado River Basin.

We also documented an overwhelming preference for local approaches to managing water shortages and a trust gap with non-local agencies. This was evidenced by respondents' preference for the local management of formal programs, such as some of the demand management and system conservation programs under consideration, as well as for the administration of funding for water conservation and other programs. State and federal water managers and agencies involved in program delivery should emphasize building trust with agricultural water users and gaining knowledge about unique features of local contexts. Simply providing additional funding for formal water conservation programs may be inadequate to meet the diversity of challenges across an area of 246,000 square miles.

Given the importance of agriculture as the primary water user in the Colorado River Basin, proactively engaging agricultural communities will be critical to successfully managing water shortages. Understanding the perspectives and preferences of agricultural water users, as documented in the report, can help guide the development of solutions that work for producers and other users in the Basin.

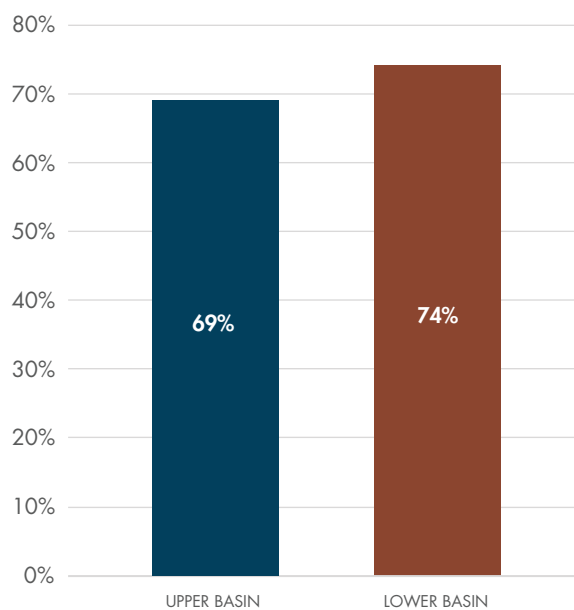
Read the full report and explore the data using the online “dashboard”: www.uwyo.edu/crb-survey

Key Collaborators: Hallie Mahowald and Matt Collins – *Western Landowners Alliance*, Max Lewis, Hilary Byerly Flint, Weston Eaton, and Lucas Thorsness – *Haub School*, Kristiana Hansen, *UW Agricultural & Applied Economics*, Mark Burbach – *University of Nebraska*, and Elizabeth Koebele – *University of Nevada-Reno*

Key Partner: Western Landowners Alliance

Funding Partner: Walton Family Foundation

Figure 2. Percentage of farmers or ranchers that have adopted 1 or more of 11 water conservation practices or adaptation strategies in response to or in anticipation of water shortages.



AGRICULTURAL LAND EASEMENTS WORKSHOP – RISING TO THE CHALLENGE

The University of Wyoming’s Ruckelshaus Institute of Environment and Natural Resources and the Intermountain West Joint Venture hosted the “Agricultural Land Easements Workshop – Rising to the Challenge” in January 2023. The two-day workshop convened land trust staff, funders, NRCS state staff, and other partners with significant experience with the USDA Natural Resources Conservation Service’s (NRCS) Agricultural Conservation Easement Program – Agricultural Land Easements (ACEP-ALE). The participants engaged in facilitated discussions around several topics intended to help improve the pace and scale of ACEP-ALE implementation. During the discussions, participants identified several key action items to improve the implementation of ACEP-ALE. These action items include:

<p>CAPACITY</p>	<ul style="list-style-type: none"> • Working to develop partner positions, that act as liaisons between land trusts and NRCS state offices, to increase NRCS and land trust capacity. • Engaging funding partners to financially support partner positions.
<p>INFORMATION SHARING</p>	<ul style="list-style-type: none"> • Collaborating to develop broad support in the agricultural and conservation communities on the importance of conservation easements.
<p>IMPORTANCE OF CERTIFIED ENTITIES</p>	<ul style="list-style-type: none"> • Sharing experiences on the impact of the certified entity program in addressing capacity constraints and accelerating time to easement closings. • Conducting outreach to adopt regulatory and statutory reforms to allow more land trusts to become certified.

The workshop addressed other topics and identified additional action items which we further describe in the workshop summary. A key outcome of the workshop was the shared recognition of the importance of frequent communication and close collaboration between NRCS state offices and land trusts to address challenges to increase the impact of ACEP-ALE.

In May 2023, USDA’s NRCS announced a plan to stream its ACEP-ALE program including adopting several of the recommendations that came out of the workshop: <https://www.nrcs.usda.gov/news/usda-unveils-efforts-to-streamline-agricultural-conservation-easement-program>

Project Leads: Travis Brammer and Drew Bennett

Key Partners: Joy Morris and Dave Smith – *Intermountain West Joint Venture*

Funding Partners: Alumbra Innovations Foundation

Read the report and the fact sheet on what is a certified entity at <https://www.uwyo.edu/haub/ruckelshaus-institute/private-lands-stewardship/agricultural-land-easements.html>

NATIONAL PARK VISITORS AS A FUNDING SOURCE FOR CROSS-BOUNDARY AND LANDSCAPE-SCALE WILDLIFE CONSERVATION

Wildlife viewing is a popular activity for many visitors to national parks. Yet, many of species that visitors want to see the most are wide-ranging and require large intact landscapes that span well beyond park boundaries for their survival. Areas outside of parks, like private working lands, are also the most susceptible to habitat loss and fragmentation due to land-use changes. Given the large visitation to national parks and the interest in wildlife viewing, national park visitors are potential untapped source of funding for cross-boundary, landscape-scale conservation efforts. In this project, we wanted to understand the importance of wildlife viewing to national park visitors, how much they spend to visit national parks, and their support for hypothetical options for raising revenue to support landscape-scale conservation efforts.



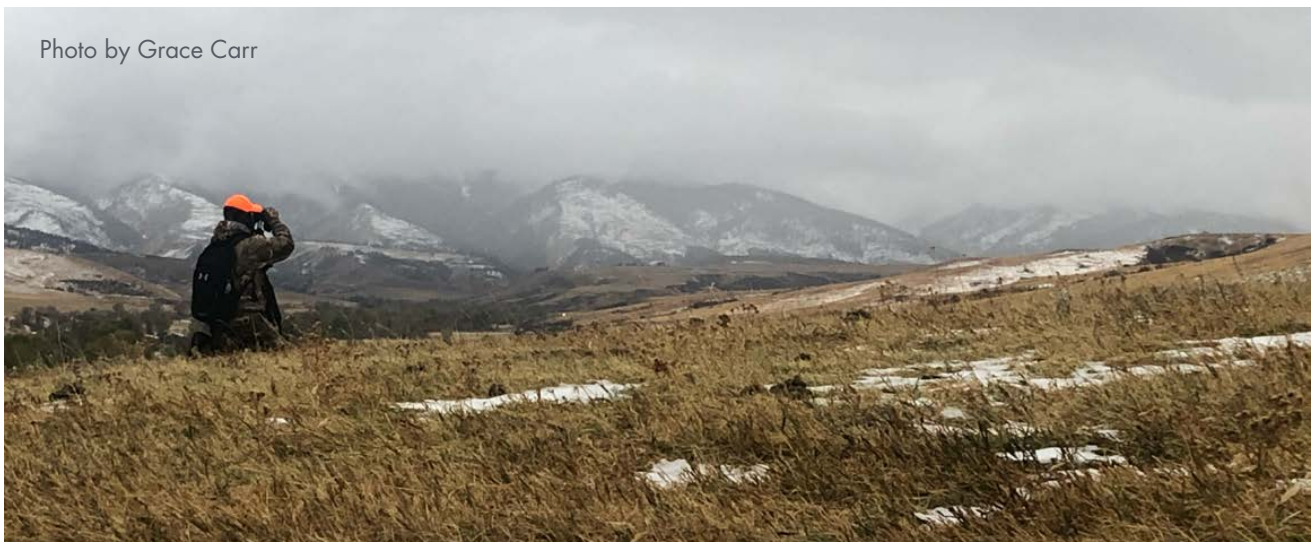
In the summer of 2022, we surveyed 991 visitors to Yellowstone and Grant Teton National Parks. We found that viewing wildlife was the primary reason to visit the parks for roughly 16% of visitors and one of several primary reasons for 62%. Only 3% said wildlife viewing was not a reason to visit. Overall, we estimated that wildlife viewing in these parks generates millions in net economic value and visitors support multiple options for contributing themselves towards large-landscape conservation, including conservation taxes and fees. Even the collection of modest fees could generate tens of millions of dollars in additional funds for conservation. Visitors to national parks are largely untapped sources of conservation funding and our results demonstrate how tapping into this funding could result in a potential win-win for wildlife viewers and conservation efforts beyond park boundaries.

Project Lead: Hilary Byerly Flint

Key Collaborators: Aaron J. Enriquez – *U.S. Geological Survey*, Arthur D. Middleton – *University of California, Berkeley*, Leslie Richardson – *National Park Service*

Funding Partners: University of Wyoming via the UW-National Park Service Small Grants Program and the Greater Yellowstone Coalition.

Photo by Grace Carr



AN ANALYSIS OF STATE AND LOCAL POLICIES TO MAINTAIN LANDSCAPE CONNECTIVITY

Landscape connectivity is critical for maintaining wildlife movements, such as the American West's iconic big game migrations. Yet, connectivity is globally threatened as landscapes become increasingly fragmented from energy infrastructure, agricultural fencing, residential developments, and other activities that cut-off corridors and restrict wildlife movements. Several U.S. states and local governments have adopted policies with the goal of protecting corridors and maintaining or enhancing landscape connectivity. However, little has been done to analyze these policies to understand different approaches at the state and local levels, the specific sectors they target, successes and challenges in policy implementation, and their impact on corridor integrity.

In this project, we analyzed 37 state policies and 10 county or municipal policies and interviewed 20 key stakeholders to better understand the scope, origin, structure, and impact of those policies. We found that most policies targeted the natural resources (n=37, e.g., wildlife management, forestry) and transportation sectors (n=37) and to a lesser degree the agricultural (n=12) and energy (n=8) sectors. The origin of policies varied from formal state-level legislation (n=16), county or municipal ordinances (n=10), administrative actions (n=9), executive orders (n=7), and resolutions or memorandums of understandings (MOUs, n=5). We also identified 10 distinct types of implementation mechanisms with the most common being the creation of a plan (n=26) and the construction of roadway crossings for wildlife (n=17). Several policies in California also included compensatory mitigation (n=7) as a novel way to address impacts to landscape connectivity.

Interviews with key stakeholders highlighted several insights about policy creation and implementation. Funding was a reoccurring theme in many interviews and most of the policies did not specifically allocate new or dedicated funding for policy implementation, resulting in some agencies reallocating internal capacity and budgets for developing plans and coordinating with other agencies and partners. Notably, only 5 policies allocated funding for policy implementation. Several interviewees noted, however, that new funding has or likely will result as an outcome of a policy. For example, several policies required the development of connectivity plans that prioritize locations for wildlife crossings over highways thus making these projects more competitive for federal transportation grants and other funding sources.

Another theme that arose from the research was the role of municipalities and counties. Many interviewees expressed that municipalities and counties have much more authority and ability to address connectivity concerns than they may realize. Other insights related to the structure or creation of the policy, the means through which the policy was implemented, and the durability of the policy. In all, this project highlights examples of the diversity of policy structures and considerations for policymakers as they consider if and how they to protect connectivity in their state, county, or municipality.

Project Lead: Travis Brammer

Key Collaborators: Heather Bradford, Joseph Budd, Colton Edwards, and Jacob Stewart – *University of Wyoming College of Law*, Sharon Buccino – *National Resources Defense Council*, and Zachary Wurtzebach – *Center for Large Landscape Conservation*

Funding Partners: William and Flora Hewlett Foundation

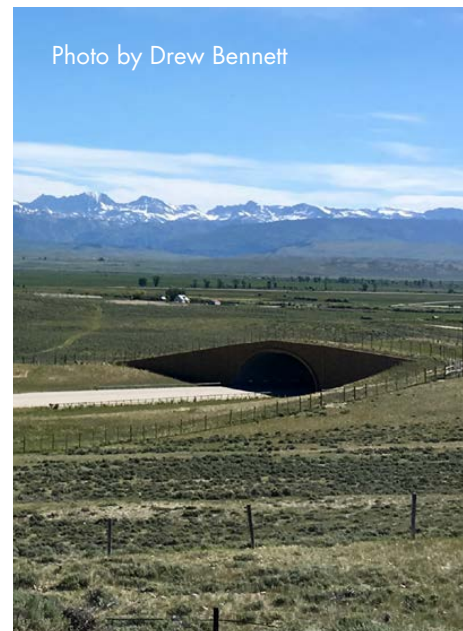


Photo by Drew Bennett

Other Research, Outreach and Engagement Projects in Progress

SUPPORTING THE WYOMING-USDA BIG GAME PILOT PROGRAM

The U.S. Department of Agriculture (USDA) and the State of Wyoming launched the Big Game Pilot Program in 2022 with the goal of supporting the conservation of migratory big game populations on private working lands across the state. The Program came after Wyoming's designation of migration corridors as a way to provide technical and financial assistance to landowners whose properties fall within designated corridors or other priority areas. Our research is supporting the effort by surveying landowners in identified priority areas to understand their experiences with big game and interest in participating in different voluntary conservation efforts. We are also interviewing key stakeholders closely involved in the development of the Pilot Program or landowners who have enrolled their property in one of the included Farm Service Agency or Natural Resources Conservation Service programs. Our aim is to examine the potential for increased enrollment and other measures of success for the Program as its implementation grows – including a recent expansion of the program to Idaho and Montana.

Project Leads: Hilary Byerly Flint and Katie Doyle

Key Collaborators: Arthur Middleton – *University of California-Berkeley*, Laura Bell – *East Yellowstone Collaborative Working Group*, Rich Iovanna – *USDA*

Funding Partners: USDA Farm Service Agency, Beyond Yellowstone Program



Photo by Drew Bennett

PRIORITIZING WATER RIGHTS AND WATER RESOURCES IN CONSERVATION PLANNING

Traditional approaches to conservation easement prioritization consider various physical characteristics of a landowner's property; whether the property has important wildlife or riparian habitat, crucial ungulate migration corridors, valuable agricultural lands, or scenic values are factors that are often taken into account. This project investigates how to effectively incorporate agricultural water rights, which are critical to the long-term viability of agricultural properties, into conservation easement planning framework in the Upper Green River Basin. Ultimately, this work will provide the Jackson Hole Land Trust with a new lens to help assess the importance of a property's water rights as they work to prioritize their efforts conserving working agricultural land in the basin.

The importance of agricultural water rights across the basin is being determined using spatial analysis techniques and data from relevant state agencies and non-profit organizations. The idea is that by understanding factors such as a water right's priority date or resiliency in times of drought across a landscape, it becomes possible to prioritize conservation efforts to maintain important agricultural lands and wetland habitat into the future. Being able to visualize these patterns will make JHLT's conservation easement planning process more robust so that they can continue to protect the Upper Green River Basin's most important lands in the face of a changing climate and altered water use regimes. Further analysis is underway to better understand how water rights in the basin might influence environmental conditions on the ground.

Project Lead: Lucas Thorsness

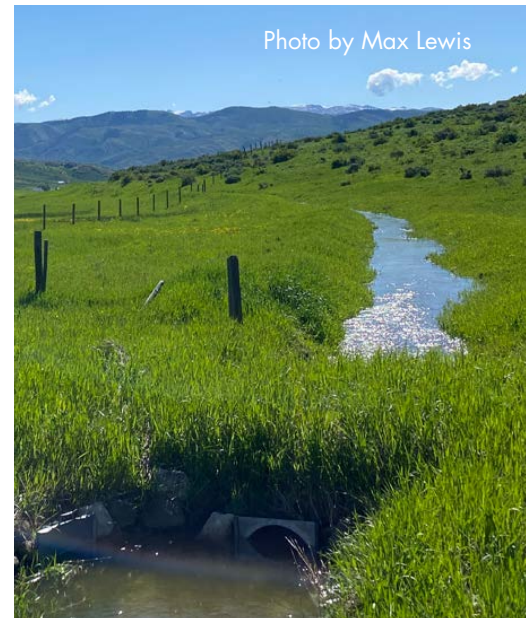
Key Collaborators: Jackson Hole Land Trust

Funding Partners: Alumbra Innovations Foundation, Land Trust Alliance's Land and Climate Grant Program

THE FIT OF INCENTIVIZED WATER CONSERVATION PROGRAMS ON WORKING LANDS IN THE UPPER COLORADO RIVER BASIN

The Colorado River Basin spans from its northern extent in the Green River Basin of Wyoming to its terminus in the Gulf of California. The Basin provides water to 40 million people across 7 western states and Mexico and is essential for irrigation on tens of thousands of farms and ranches. Increasing demand for Basin water combined with climate driven decreases in supply have resulted in roughly 20% decline in water availability and created an unfolding crisis for water users in Basin. An array of conservation programs are incentivizing voluntary and compensated water conservation through practices such as infrastructure improvements, crop switching, and temporary water leases. This research project focuses on understanding how the water conservation strategies and incentive structures offered to agricultural water users align with their interests and needs. Using the Green River Basin of Wyoming and the Yampa River Basin of Colorado as case studies, this project incorporates existing data and semi-structured interviews with landowners, government staff and non-governmental organizations. The output of the research project is intended to inform the design and implementation of programs that reduce the consumptive use of water in the Colorado River Basin through incentives that work for agricultural operations.

Project Lead: Max Lewis



SOCIAL DIMENSIONS OF CONSERVATION IN THE CENTRAL GRASSLANDS OF NORTH AMERICA

Grasslands are one of the most threatened ecosystems globally, yet remain one of the least protected. Despite the significance of grasslands for provisioning key ecosystem services and supporting high biodiversity, diverse systems of governance and stakeholder priorities challenge efforts to protect the biome. Through a series of case studies, this project engages with the overlapping and multidimensional human factors shaping land use within the grasslands. Case studies will be supplemented with workshops that engage key stakeholders across industry, tribes, conservation

practitioners and rural communities in order to facilitate collaborative discussion of key issues in the grasslands. Synthesizing findings from these case studies and workshops, the aim of this research is two-fold: to offer guidance on coordinating conservation work across diverse stakeholder interests, and to highlight areas of previous success with the potential to be replicated in other locations across the biome.

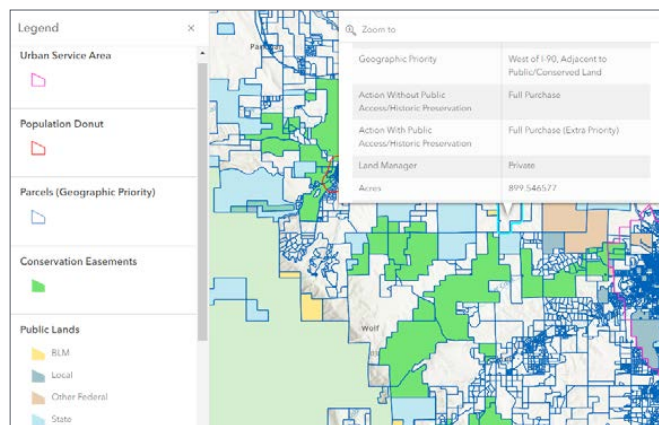
Project Lead: Callie Berman

Key Collaborators: Jeremy Pittman – *University of Waterloo*

Funding Partners: Northern Great Plains Joint Venture, Knobloch Family Foundation

GEOSPATIAL CONSERVATION PLANNING WITH THE SHERIDAN COMMUNITY LAND TRUST

The Sheridan Community Land Trust (SCLT) in Sheridan, Wyoming worked with the MacMillan Program to develop a new geospatial conservation planning tool. Conservation planning is an important aspect of a land trust’s work that allows them to manage decision making so that their specific goals can be visualized and met. SCLT already has a geospatial conservation planning tool in place, but they are looking to incorporate new priorities into their planning process using this new geospatial tool. With the updated tool, SCLT is better positioned to conserve the most important landscapes in Sheridan County for the benefit of people, sensitive wildlife, and the region’s environmental health.



Project Lead: Lucas Thorsness

Key Collaborators: Meghan Kent – *Sheridan Community Land Trust*

ANALYSIS OF OPTIONS AND MOTIVATIONS FOR PRIVATE LANDOWNERS TO ALLOW PUBLIC RECREATION ON THEIR LANDS

Playing and “being” in natural areas, whether they be in wilderness, rural, or urban areas, are among the priorities that humans require for physical and emotional well-being. Many recognize the personal and social need, however, where to play and “be” faces barriers including limited access for some. Although there are numerous public natural spaces (e.g., state and national parks, national forests) there would be more locations and opportunities if private lands were made available. This research focuses on the barriers and opportunities for voluntary private land conservation to enable public access to open, natural spaces.

Project Lead: Nita Tallent

Key Collaborators: Mark Perkins – *University of Wyoming College of Education*



Other Program Updates

RECOVERING GRASSLAND BIRD POPULATIONS

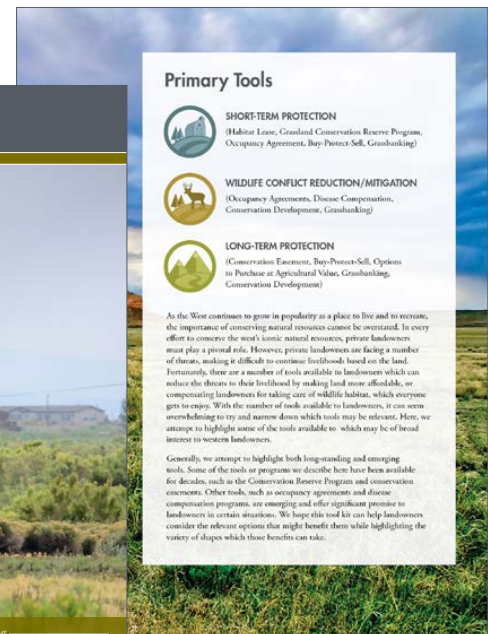
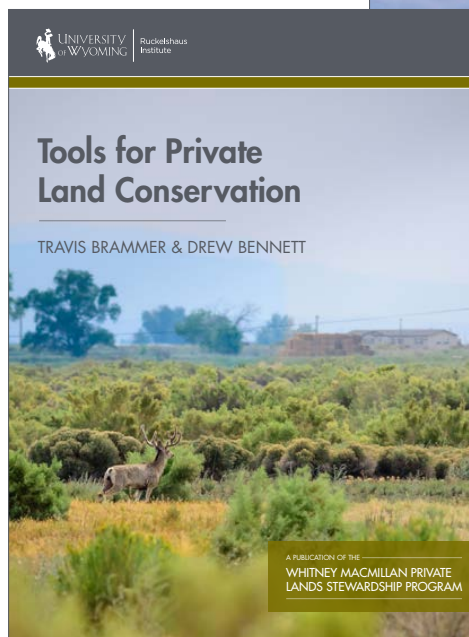
More than 75% of grassland birds are declining in population –the highest percentage of any biome in North America. MacMillan Professor of Practice Dr. Drew Bennett is participating in an international working group focused on an integrating interdisciplinary datasets to set guide conservation efforts with the goal of stabilizing and recovering grassland bird populations. The Integrating Multidisciplinary Data Layers into the Central Grassland Avian Modeling Project is supported by the Morpho Synthesis initiative at the

National Center for Ecological Analysis and Synthesis (NCEAS) and is focused on North America’s Central Grasslands – spanning from northern Mexico to south Canada. The two-year modeling effort will result in actionable data products to support how and where to allocate resources for conservation and recovery of grassland bird populations. For more information, visit the Morpho Synthesis group’s page – <https://www.nceas.ucsb.edu/workinggroups/morpho-integrating-multidisciplinary-data-layers-central-grassland-avian-modeling>



FEATURED PUBLICATION

A recent publication from the MacMillan Program led by Travis Brammer and Drew Bennett highlights the portfolio of tools available for voluntary conservation on private lands. While many of these tools, such as conservation easements and the Grassland Conservation Reserve Program, are well established and commonly used, others, such as habitat leases and occupancy agreements, are emerging with the potential for continued innovation and expansion to address pressing natural resource conservation needs on private lands. Read the publication at <https://www.uwyo.edu/haub/files/docs/ruckelshaus/pubs/2023-tools-for-private-land-conservation.pdf>.

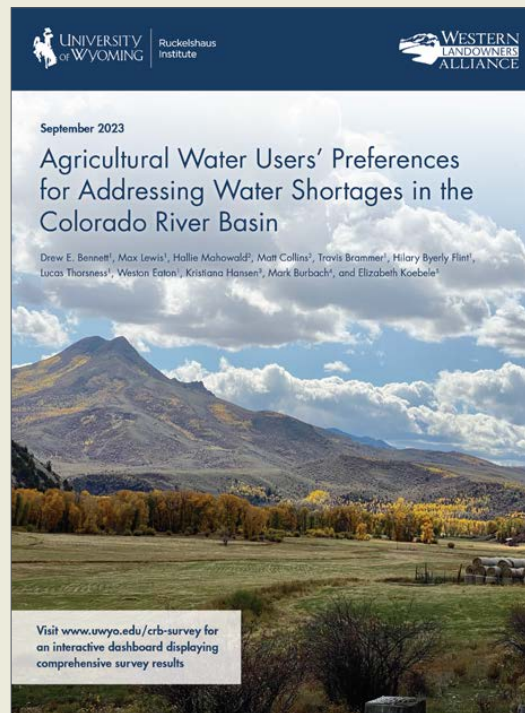


In the Media

The survey of farmers and ranchers in the Colorado River Basin project received significant media attention across the region and in national outlets. Collaborator Hallie Mahowald with the Western Landowners Alliance was interviewed live on Denver 850 KOA's morning news program. Denver's Next with Kyle Clark on 9News featured a segment on the study with a brief clip from an interview with Drew Bennett. Dozens of other newspapers and radio programs covered the study including several regional NPR stations, *Colorado Politics*, the *Denver Gazette*, and the national political website *The Hill*.

ACCESS A SAMPLING OF THE MEDIA COVERAGE:

850 AM- KOA (Denver, CO): <https://koacolorado.ihc.com/featured/colorado-news/content/2023-09-26-western-landowners-alliances-hallie-mahowald-on-new-co-river-basin-survey/>



Next with Kyle Clark on 9News (Denver, CO): <https://www.9news.com/video/news/local/next/next-with-kyle-clark/study-says-farmers-along-colorado-river-are-willing-to- conserve-water-without-federal-regulations/73-31079295-6200-46f2-9a06-67943d32d284>



KUNC (Greeley, CO): <https://www.kunc.org/news/2023-09-26/colorado-river-growers-say-theyre-ready-to-save-water-but-need-to-build-trust-with-states-and-feds>

Capital Press (western US): https://www.capitalpress.com/ag_sectors/water/survey-reveals-barriers-to-colorado-river-water-conservation/article_f847b6d2-5e2e-11ee-a65a-6fd3042aa5c4.html

The Hill (national): <https://thehill.com/policy/equilibrium-sustainability/4224093-upper-colorado-river-basin-states-renew-plan-to-pay-farmers-for-water-conservation/>

Publications

Bennett, D. E. and T. Brammer. 2023. Agricultural Land Easements Workshop – Rising to the Challenge: Workshop Summary and Action Items. University of Wyoming, Laramie, WY: Ruckelshaus Institute of Environmental and Natural Resources. Available at: <https://www.uwyo.edu/haub/ruckelshaus-institute/private-lands-stewardship/agricultural-land-easements.html>

Bennett, D. E. and T. Brammer. 2023. Habitat leasing as an alternative to affirmative conservation easements in conserving wildlife on private lands. *Wildlife Society Bulletin*. 47:e1477. Available at: <https://wildlife.onlinelibrary.wiley.com/doi/full/10.1002/wsb.1477>

Bennett, D., M. Lewis, H. Mahowald, M. Collins, T. Brammer, H. Byerly Flint, L. Thorsness, W. Eaton, K. Hansen, M. Burbach, and E. Koebele. 2023. *Agricultural water users' preference for addressing water shortages in the Colorado River Basin*. University of Wyoming, Laramie, WY: Ruckelshaus Institute of Environmental and Natural Resources. Available at: <https://www.uwyo.edu/haub/files/docs/co-river-basin-ag-water-users-survey.pdf>

Bennett, D., and C. Mathis. “Custodians of two interests: Navigating economic realities and opportunities in stewarding private lands.” Chapter 13 in R. Lopez, J. Sanders, and J. Cathey, eds. *The Art and Science of Private Lands Stewardship*. Texas A&M University Press. *Forthcoming*.

Brammer, T., and D. Bennett. 2023. *Tools for Private Land Conservation*. University of Wyoming, Laramie, WY: Ruckelshaus Institute of Environmental and Natural Resources. Available at: <https://www.uwyo.edu/haub/files/docs/ruckelshaus/pubs/2023-tools-for-private-land-conservation.pdf>

Ferraro, P., T. Cherry, J. Shogren, C. Vossler, T. Cason, **H. Byerly Flint**, et al. 2023. Create a culture of experiments in environmental programs. *Science* 381(6659)L 735-737. Available at: <https://www.science.org/doi/10.1126/science.adf7774>

Haggerty, J.H., K. E. Epstein, **D. E. Bennett**, B. Milton, L. Nowlin, and B. Martin. 2023. “Wildlife, rural communities, and the rangeland livelihoods they share: opportunities in a diverse economies approach” Chapter 30 in L. B. McNew, D. K. Dahlgren, and J. L. Beck, eds. *Rangeland Wildlife Ecology & Conservation*: 933-967. Springer: Cham, Switzerland. Available at: https://link.springer.com/chapter/10.1007/978-3-031-34037-6_27

Paolini, K., A. Sisneros-Kidd, N. Gautier, R. Bonnie, K. E. Wallen, and **D. E. Bennett**. *Forthcoming*. Perpetuating corridor conservation: Using public perception to advance big game management. *Wildlife Society Bulletin*.

Whittman, T., and D. E. Bennett. *Forthcoming*. Cows or condos: Rancher and land-use outcomes following compensated federal grazing permit waivers. *Rangeland Ecology and Management*.



Photo by Callie Berman



Maggie Lang monitors an easement while interning with the Wyoming Stock Growers Land Trust during summer 2022

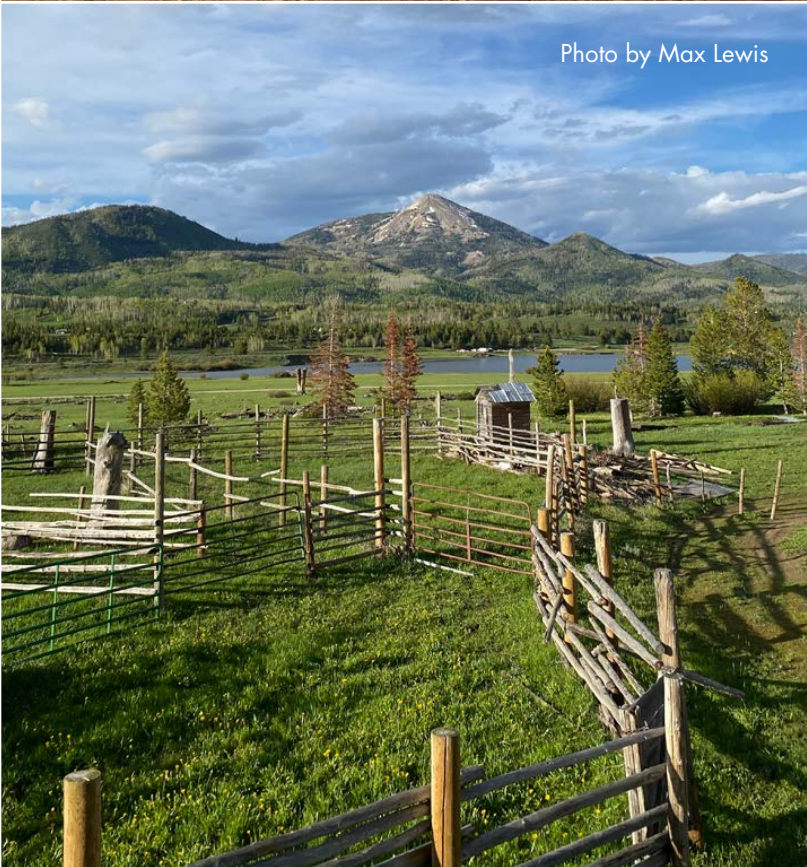


Photo by Max Lewis



Photo by Grace Carr



A PUBLICATION OF THE
**WHITNEY MACMILLAN PRIVATE
LANDS STEWARDSHIP PROGRAM**



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