

MacMillan Private Lands Stewardship Program

FALL 2024 - SPRING 2026
PROGRAM UPDATE

A PUBLICATION OF THE
WHITNEY MACMILLAN PRIVATE
LANDS STEWARDSHIP PROGRAM



Dear partners and friends of the program,

This update covers a longer stretch than usual — Fall 2024 through Summer 2026 — spanning the year I spent on sabbatical, partially in Australia. That time away gave me the chance not only to learn from a new research community and landscape, but also to step back and reflect on the MacMillan Program’s first six years and the role it plays in supporting the stewardship of private lands across Wyoming and the West.

I think about that impact less in terms of the metrics often used in academia, such as journal impact factors and citation counts, and more in terms of something harder to quantify but far more meaningful to me: whether our work helps landowners and land managers make more informed decisions, and whether it strengthens the broader conservation community’s capacity to partner with those landowners to conserve the land, water, and wildlife that private lands provide. Looking back at those six years through this lens, I’m proud of what this program has built, including several projects highlighted in this report.

Virtual fencing is a clear example of that impact in motion. What started as a partnering role in a 2024 workshop convening ranchers, conservationists, and other stakeholders to explore this emerging tool has grown into a genuine body of work. MacMillan alum Travis Brammer is on the leading edge of putting these ideas into practice, piloting virtual fencing technology on the ground and earning a feature in the New York Times — a direct line from research and training here at UW to real innovation in the field. We’re now deep into case studies of pilot projects that Travis helped spearhead and preparing for a follow-up workshop this year.

We saw that same kind of traction elsewhere. Senior Research Scientist Hilary Byerly Flint’s research on national park visitors’ willingness to fund transboundary wildlife conservation was picked up by several media outlets and is advancing conversations around new mechanisms to fund conservation beyond park boundaries. And our partners continue to trust us with work at a growing scale, from the \$3.1 million multi-institution Grassland Futures effort led by The Nature Conservancy, to bringing social science expertise to Wyoming’s Migratory Big Game Initiative, which has grown into a west-wide conservation framework at USDA.

That impact also shows up in the people who move through our program, three of whom have taken exciting next steps in their careers and are highlighted in the following pages. Watching our research and training shape the next generation of conservation professionals is one of the clearest measures of impact I know. We’ve also welcomed new energy to the team: Callie Berman stepped into a new role as Associate Research Scientist, and we’re excited to bring on incoming graduate students Kara Clarke and Adrianna Williams this fall.

None of this happens without the trust and collaboration of our partners. As I look ahead to the next chapter of this program, I’m looking forward to continuing to work alongside all of you to turn research, teaching, and outreach into real impact on the ground. Thank you for sticking with us through these two busy years, and I look forward to catching up with many of you soon.

With warm regards,

Drew Bennett

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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.



Meet the Team

Research Scientists



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.

Graduate Research Assistants



JOCELYN WULF, Graduate Research Assistant

Jocelyn first became interested in the intersection between natural resources and environmental challenges at Dartmouth College, where she received a BA degree in Anthropology and Environmental Studies in 2020. While in New Hampshire, Jocelyn worked with the Natural Resources Defense Council to facilitate dialogue between paper companies and First Nations peoples to increase sustainable logging practices in the Canadian boreal forest. Following graduation, she returned to her home city of Washington, DC to work for The Nature Conservancy, focusing on the administration of national and international conservation grants. After 3 years at TNC, she left to become the Duck Watch Lead for City Wildlife– educating DC residents about urban waterfowl, safely relocating duck families, and rehabbing injured and abandoned ducklings. Jocelyn is excited to begin her graduate studies in Environment, Natural Resources, and Society in the Fall of 2024, where she will focus on natural capital approaches to conservation and ESG incentivization.

Incoming Graduate Students



KARA CLARKE, Graduate Research Assistant

Kara grew up in Wyoming, where a background in agriculture and a love for the outdoors inspired her interest in conservation. She earned a B.S. in Animal and Veterinary Sciences with a concentration in Production and a minor in Wildlife and Fisheries Biology and Management from the University of Wyoming. Her experiences in agriculture, fisheries, and wildlife conservation across the West led her to pursue research focused on practical solutions for working landscapes. In Fall 2026, Kara will begin graduate studies in Environment, Natural Resources, and Society while working with the MacMillan Program on a project investigating applications of virtual fencing technology in environmental conservation. Outside of her academic and professional pursuits, she enjoys hiking with her dog, hunting, fishing, and exploring the Rocky Mountain West.



ADRIANNA WILLIAMS, Graduate Research Assistant

Adrianna Williams is pursuing a Master of Science in Environment, Natural Resources, and Society at the University of Wyoming. She earned a Bachelor of Arts in Political Science and a Bachelor of Science in Environmental Science from the University of Missouri. Her research interests focus on community-driven environmental solutions and water allocation policy. Her passion for the outdoors began during her childhood growing up in rural Missouri and has continued through the past several years spent seasonally working as a whitewater raft guide on the Colorado River in southeastern Utah. Outside of her academic work, Adrianna enjoys hiking, snowboarding, and rock climbing.



SERA GLASS, Headwaters of the Colorado Graduate Communications Intern

Sera completed her master’s practicum with the Headwaters of the Colorado Initiative in summer 2026, working with the organization to develop webpage explainers for watershed restoration. She developed five webpages directed toward potential funders and landowners, overviewing five different concepts: watershed, river/floodplain, wet meadow, forest, and restoration methods. She plans to work within the conservation communication industry, and collaborating with HoC gave her the opportunity to create visual materials for a specific audience in an accessible way — a skill that’s valuable throughout the communication world. She was even able to join hydrological experts on a field outing to examine restoration opportunities on tributaries in the Colorado River Basin, an experience that helped inform the text and visuals she created for the explainers. Beyond gaining new skills in conservation communication, she also came away with a better understanding of what “restoration” means and just how complicated it can be to operate in the restoration world — there are so many ideas about what “good” restoration looks like. She’s excited to take what she’s learned collaborating with HoC and apply it to her future work.

Featured Supported Student Experiences



JACK VOLLBRECHT, Wyoming Stock Growers Land Trust Student Intern

Jack was an intern with WSGLT this past summer. Over the course of the summer, he was responsible for monitoring and enforcing conservation easements across the state of Wyoming. His duties included reviewing conservation easement deeds, monitoring properties for violations, and helping to create deeds for new conservation easements. This experience with WSGLT laid the groundwork for Jack’s upcoming master’s program in the Haub School focused on voluntary wildlife conservation.



EZRA STEPANEK, Headwaters of the Colorado Student Intern

Ezra was a communications intern with the Headwaters of the Colorado Initiative during the Spring 2026 semester. He redesigned and created content for their website to more effectively communicate the collaborative’s work, goals, and mission. He also designed informational materials, including multiple flyers, a five-page fundraising document, a conference poster, a newsletter template, and information sheets. Working with HoC gave Ezra valuable experience collaborating with professionals to communicate real-world environmental information, while strengthening his web design, graphic design, and synthesis skills. Ezra enjoyed his time with HoC and appreciates the connections he made through the opportunity, which led to additional contracted work related to water management in the headwaters region of the Colorado River Basin.

HAPPY TRAILS!

Over the past two years, team members Nita Tallent, Katie Doyle, and Lucas Thorsness left the team to take exciting next steps in their careers.

Nita successfully defended her thesis, “A Tale of Two Trails,” before stepping into a new role teaching science at Wheatland High School. She calls it the hardest job she’s ever attempted, but she remains as committed as ever to the mission and to serving a rural part of the state.

Katie completed her master’s studying the social dimensions of migration corridor conservation in Wyoming before joining PERC this past year as a Conservation Associate in the Conservation Innovation Lab, where she’s helping the team test innovative conservation ideas on the ground — including supporting several exciting pilot applications of virtual fencing in conservation.

Lucas spent several years with the program, first as a graduate student and then as a Research Scientist in a joint position with the Merkle Research Group, creating geospatial tools and datasets to improve conservation for migrating big game and advance our understanding of water rights in the Upper Green River Basin. He has now started as the Eastern Colorado Additive Conservation Manager, where he’ll work with landowners to implement conservation practices that enhance agricultural productivity and natural resources on their land.

We wish Nita, Katie, and Lucas very happy trails in their paths ahead and will greatly miss their contributions to the team. We look forward to future collaborations in their new roles and are excited to see all they will achieve.



Featured Projects

ADVANCING VIRTUAL FENCING: FROM WORKSHOP TO THE FIELD

Building on the momentum of the June 2024 “Cattle and Conservation” workshop hosted with the Property and Environment Research Center (PERC), Beyond Yellowstone Living Lab, and other partners, the MacMillan Program’s virtual fencing work has grown substantially over the past two years — moving from early conversations about the technology’s potential into published research, regional outreach, and legal scholarship.

The centerpiece of this work is a new perspective article, “Advancing Conservation Through Virtual Livestock Fencing,” published in the journal Biological Conservation in collaboration with co-authors from PERC, the Greater Yellowstone Coalition, World Wildlife Fund and other partners across the region. The article examines the conservation potential of virtual fencing technology and outlines how conservation organizations can accelerate its deployment through cost-sharing partnerships, habitat lease agreements, payment for ecosystem services schemes, and supportive policy frameworks.

The program also helped translate this research into practice on the ground. In January 2025, 125 ranchers, land managers, and conservationists gathered in Cody, Wyoming, for the Wyoming Virtual Fence Symposium, organized by the East Yellowstone Collaborative and the Greater Yellowstone Coalition to explore the potential of virtual fencing to improve livestock management, conservation outcomes, and rangeland health across the Greater Yellowstone Ecosystem. The symposium was funded in part through an Alumbra Innovations Foundation grant to the Haub School, and Callie Berman played a key role in providing the MacMillan Program’s financial and technical support for the event.

Finally, JD/MA student Sam Johnson contributed an important legal dimension to this work, publishing “Fencing in a Technological Age: Utilizing Federal Regulatory Frameworks to Implement Virtual Fencing on Federal Public Land” in the Colorado Environmental Law Journal. The article examines how virtual fencing fits within the existing legal frameworks that govern the BLM and U.S. Forest Service — including range improvement regulations, right-of-way law for communication infrastructure, and NEPA review processes — and draws on case studies from Colorado and Nevada to show how early adopters have navigated these rules in practice. Johnson closes with a set of policy recommendations, including calls for clearer agency guidance, better coordination between the BLM and Forest Service, and stronger data privacy protections for ranchers using the technology on public land.

Project Leads: Drew Bennett, Callie Berman, Sam Johnson

Key Partners: Property and Environment Research Center, Greater Yellowstone Coalition, World Wildlife Fund, Beyond Yellowstone Living Lab

Funding Partner: Alumbra Innovations Foundation

Publications: <https://celj.cu.law/?p=1159#post-1159-Toc230013700>



INVESTING IN NATURAL CAPITAL: LESSONS FROM THE AMERICAN WEST

In the American West, growing wildfire risk, drought, and strained water supplies have pushed conservation groups, investors, and public agencies to look for new ways to fund protection and restoration of natural capital — the forests, rivers, and rangelands that provide clean water, wildfire resilience, and other benefits underpinning both ecosystems and local economies. Despite its enormous value, natural capital is chronically undervalued and underfunded through conventional economic and policy channels, prompting a wave of experimentation with new investment models meant to close that gap.

What We Did

We conducted a comparative analysis of four natural capital investment initiatives across the American West, examining their financing structures, governance models, and ecological and economic outcomes. Drawing on interviews with key stakeholders and review of project documents, annual reports, feasibility studies, and media coverage, we investigated what makes these investments succeed or stall. The four cases include: Blue Forest’s Yuba I Forest Resilience Bond, which used blended capital to accelerate forest restoration and reduce wildfire risk; the May Ranch conservation easement and carbon credit project, which paired permanent land protection with participation in carbon markets; Quantified Ventures’ Environmental Impact Fund for wildfire mitigation, an ambitious pay-for-success model that ultimately never launched; and the Teton Basin Water Users Association’s incidental aquifer recharge initiative, which has sustained voluntary participation even though the water market it anticipated never materialized.

What We Found

1. **Blending Capital:** Successful initiatives combined philanthropic, public, and private capital to balance risk, attract partners, and sustain long-term efforts.
2. **“Sufficient Science”:** Credible, actionable ecological data — even amid uncertainty — was critical for building trust and justifying investment.
3. **Social Capital is Foundational:** Strong networks of trust and collaboration often enabled collective action even when financial incentives alone were weak.



4. **Scale Matters:** Projects designed to cross ecological and economic thresholds, such as landscape-level forest treatments, were more likely to generate measurable benefits and justify continued investment.
5. **Structural Limits Persist:** Many projects still depend on philanthropic or public funding, and success often hinges on unique legal, ecological, or institutional conditions that limit replication elsewhere.

These findings suggest natural capital investments are promising but contextual solutions that work best when aligned with local conditions and designed as integrated socio-ecological initiatives rather than purely financial mechanisms. While they cannot fully resolve the underlying problem that many ecosystem services remain economic externalities, they offer valuable pathways for channeling more resources toward conservation and restoration where enabling conditions exist.

Project Lead: Jocelyn Wulf

Funding Partner: Alumbra Innovations Foundation

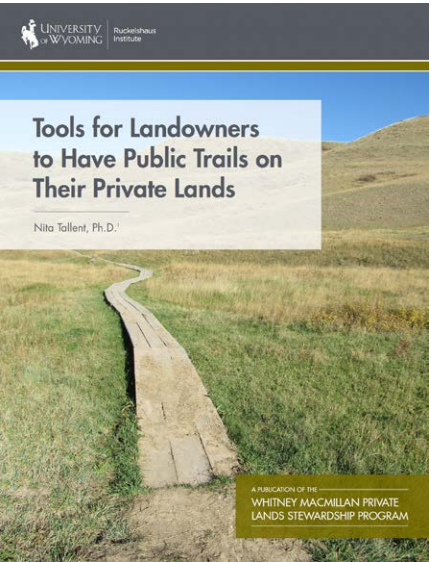
Read the report: <https://wyoscholar.uwyo.edu/items/92d3e599-b413-4bef-bff9-76e48f71dd59>



TOOLS FOR LANDOWNERS TO HAVE PUBLIC TRAILS ON THEIR PRIVATE LANDS

Although public lands host hundreds of millions of acres of trails, gaps between those lands in urban, rural, and peri-urban areas often leave recreationists without a way to connect to them or to open space closer to home. Private land in between could fill that gap, but landowners face a real conundrum: how to open their land to the public for recreation or transportation without giving up their rights, privacy, and security. The same conservation tools long used to protect private land for habitat, agricultural production, scenic, and historic values can also be used to establish public trail access—often while benefiting the landowner financially.

This handbook draws on conversations with land trusts, conservation professionals, and landowners across the country to understand how public trails get established on private land. It walks landowners through the full process: assembling the right team of legal, financial, and conservation partners; choosing among the mechanisms available to decide whether they retain or relinquish title to their land; setting up stewardship, monitoring, and collaborative agreements; and addressing common landowner concerns around liability, privacy, and accessibility. It includes appendices with a directory of resources, a model memorandum of agreement, and a guide to funding sources for trails. More specifically, the handbook highlights the following insights:



1. **No One-Size-Fits-All Mechanism:** Landowners can choose among at least eleven mechanisms for establishing public trail access, from conservation easement donations and licensed trail agreements to outright sale.
2. **Tax Incentives Can Offset the Cost:** Conservation easements donated for public recreation, habitat, or historic preservation can qualify for a federal income tax deduction under IRC § 170(h).
3. **A Cross-Disciplinary Team Is Essential:** Successful projects bring in a land trust representative, legal counsel, financial advisor, and government or recreation partners from the start, since few land trusts alone have the capacity for long-term ecological stewardship.
4. **Stewardship Has Three Distinct Layers:** Easement compliance monitoring, ecological land stewardship, and trail condition monitoring each require separate attention—and unlike public lands, private trail lands generally lack a mandated regulatory structure for any of them.
5. **Legal Protections Vary by State:** Recreational Use Statutes shield landowners from liability as long as they don't charge a fee or restrict access, but policies differ significantly by state, and the risk of prescriptive easements from long-term casual use remains an unsettled legal issue in parts of the West.
6. **Grant Funding Favors Nonprofits:** Individual landowners generally can't apply directly for government trail grants, which pushes many toward partnering with a land trust or other nonprofit to access funding.

The handbook is meant as a starting point for curious landowners and other stakeholders rather than legal, financial, or conservation advice, – and it points landowners toward the professionals who can tailor guidance to their property and state. Ultimately, it aims to expand the public's opportunities to enjoy the outdoors, regardless of who owns the land they explore.

Project Lead: Nita Tallent

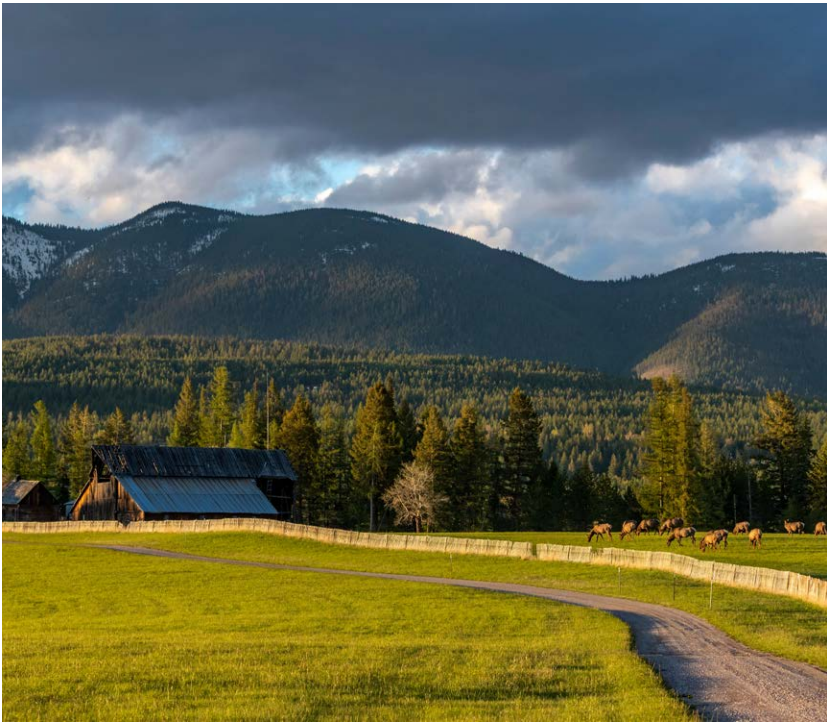
Read the handbook: www.uwyo.edu/haub/files/docs/ruckelshaus/pubs/public-trails-private-lands-handbook.pdf



Example business model highlighting the Yuba 1 Forest Resilience Bond.

LIVING WITH ELK, MULE DEER, AND PRONGHORN: LANDOWNER EXPERIENCES WITH BIG GAME ACROSS WYOMING

Migratory big game—elk, mule deer, and pronghorn—depend on resources spread across the landscape and move seasonally to find them. Across the American West, roads, residential growth, and energy development have squeezed these species into narrow corridors that cross private working lands. In 2022 the U.S. Department of Agriculture, in partnership with the State of Wyoming, launched the Migratory Big Game Pilot to conserve elk, mule deer, and pronghorn migration corridors and habitat, later scaling the effort into Idaho and Montana as the Migratory Big Game Initiative. Understanding how landowners who live alongside these animals experience conflict, manage their land, and view conservation programs is essential to the Initiative’s success.



What We Did

We are conducting a multi-year evaluation of how the Migratory Big Game Initiative affects landowner attitudes, intentions, and conservation behavior. In the first phase, we mailed surveys to 2,276 landowners of 40 or more acres across Wyoming priority areas and surrounding big game range, asking about their experiences with and attitudes toward big game, their land management plans for the next decade, and their views on conservation programs. We received 631 responses, a 28% response rate, and will resurvey landowners in a few years to track how sentiments and behaviors change alongside this large-scale public investment in habitat conservation.

What We Found

- 1. **Positive Attitudes Despite Conflict:** Most livestock producers reported fencing damage, trespassing, and forage competition from big game, yet over 90% of landowners still said they enjoy seeing big game on their land, and most are proud to provide habitat.
- 2. **Proactive Management:** Many landowners have adopted wildlife-friendly fencing, left extra forage for big game, and managed invasive species to benefit wildlife, often adopting several practices at once.
- 3. **A Coming Land Transition:** 70% of landowners said it is at least somewhat likely they will transfer their land to the next generation within 10 years, and the average landowner age is 68.
- 4. **Intent to Keep Land Intact:** Despite this coming transition, 69% said selling is unlikely and 83% said subdividing is unlikely, reflecting a strong desire to preserve intact landscapes.

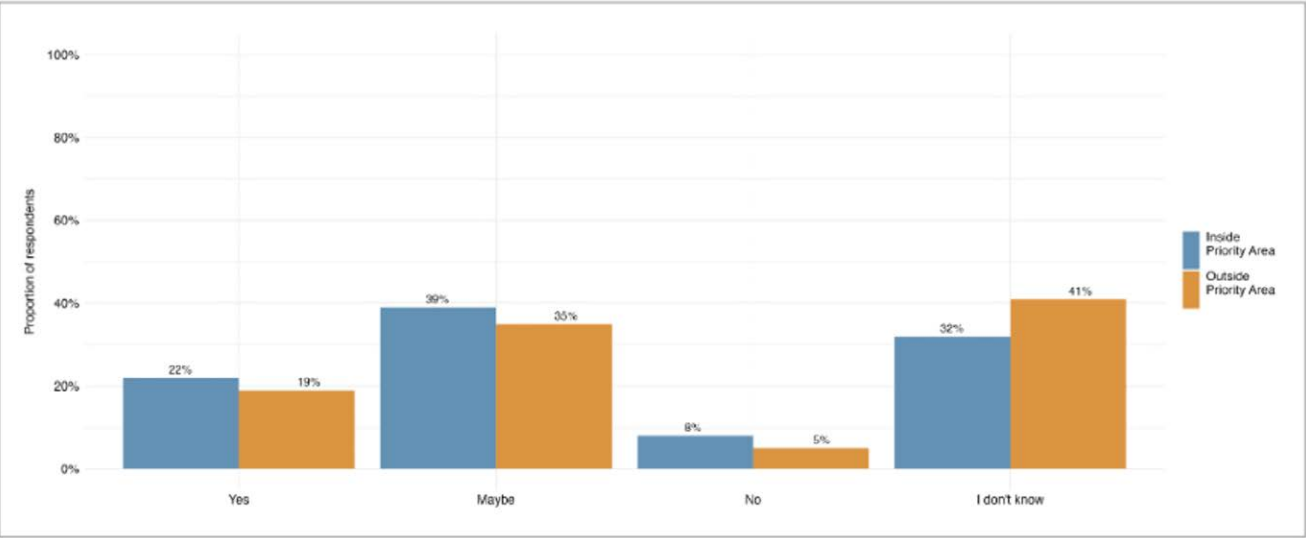
- 5. **An Engagement Gap:** Few landowners have connected with conservation organizations, though the Wyoming Game and Fish Department has worked with 62% of respondents and earned high trust and willingness to collaborate again.
- 6. **Low Awareness, High Openness:** Most landowners are unfamiliar with the Migratory Big Game Initiative, but over 90% are at least open to participating once informed, pointing to a major outreach opportunity.

Together, these findings point to a landowner base that is largely supportive of big game and inclined to keep their land intact—a promising foundation for conservation. Realizing that potential will require bridging the engagement gap, raising awareness of program offerings, and helping landowners’ intentions translate into lasting, landscape-scale outcomes as land passes to the next generation.

Project Lead: Hilary Byerly Flint

Funding Partners: U.S. Department of Agriculture under agreement number FSA22CPT0012500; Beyond Yellowstone Living Lab

Read the report: https://www.uwyo.edu/haub/_files/_docs/landowner-exp-big-game.pdf



When asked about whether they would participate, landowners expressed considerable interest in (and uncertainty about) participating in the Migratory Big Game Initiative

Ongoing Research, Outreach, and Engagement Efforts

GRASSLAND FUTURES: A COLLABORATIVE RESEARCH PROJECT TO INCREASE GRASSLAND RETENTION

Grasslands across the Great Plains of the United States and Canada are being converted at an alarming rate, with 1.9 million acres of intact grassland lost to row crop conversion in 2022 alone. Once converted, impacts to biodiversity and carbon storage are immediate and difficult to reverse, and restoration can take decades. The MacMillan Program has joined Grassland Futures, a multi-year, multi-institution research effort to better understand what drives grassland conversion and what enables long-term retention.



The \$3.1 million project, led by The Nature Conservancy, brings together multiple partners including Nature United, World Wildlife Fund, Colorado State University, Cornell University, Michigan State University, the University of Alberta, and the University of Wyoming in a highly collaborative, co-developmental model. The team is building a shared picture of current grassland extent and conversion trends, then digging into why some working grasslands stay intact while others don't and what can be done to tip the balance toward retention.

Callie Berman is leading the MacMillan Program's involvement in the project and spearheading efforts to identify the social, cultural, economic, and ecological factors that enable grassland retention despite conversion pressure—including supporting mapping of land ownership dynamics in high-risk counties and exploring real-world case studies of successful retention. The project team will also translate these findings into practical guidance, working with partners to build a systems-level understanding of how these factors interact and to identify concrete pathways and solutions for keeping grasslands intact. Results will be synthesized and shared broadly with producers, NGOs, companies, and researchers across the Great Plains.

Project Lead (MacMillan Program): Callie Berman

Funding Partner: Foundation for Food and Agriculture Research

Key Partners: The Nature Conservancy, Nature United, World Wildlife Fund, Colorado State University, Cornell University, Michigan State University, University of Alberta

BEHIND THE DEAL: INVESTMENT STRUCTURES AND INVESTORS IN NATURAL CAPITAL PROJECTS

Building on findings from our comparative study of natural capital investment initiatives in the American West, this project takes a closer look at the mechanics behind these deals — examining common impact investment structures and the range of investor types participating in conservation and natural capital projects. As interest in blended finance approaches continues to grow, understanding how different capital sources (philanthropic, public, and private) are structured and combined, and what motivates different investor types to participate, is critical for designing natural capital investments that are both financially viable and ecologically effective. This research aims to provide practitioners and potential investors with a clearer roadmap for navigating and replicating successful investment models across the region.

Key MacMillan Personnel: Jocelyn Wulf

Funding Partner: Alumbra Innovations Foundation



FROM PILOTS TO PRACTICE: ADVANCING VIRTUAL FENCING AS A TOOL FOR RANCHING AND CONSERVATION

Building on the momentum of the 2024 “Future of Virtual Fencing: Cattle and Conservation” workshop, the MacMillan Program is hosting a follow-up workshop in 2026, in partnership with the Property and Environment Research Center (PERC) and the Beyond Yellowstone Living Lab, to continue advancing how virtual fencing technology can support both ranching operations and wildlife conservation goals. As part of a broader effort, we also are conducting an in-depth review of five virtual fencing pilot projects to glean practical lessons on how the tool is being used on the ground for livestock production and natural resource conservation alike. These case studies will help identify common challenges, promising practices, and pathways for broader adoption among the ranching and conservation communities.

Key MacMillan Personnel: Kara Clarke

Key Partners: PERC, Beyond Yellowstone Living Lab

Funding Partner: Alumbra Innovations Foundation



Markets, Marsupials and Memories: Reflections from Time Down Under

In the previous program update, I shared that I'd be spending the first half of 2025 in Canberra, Australia, as a Fulbright Scholar and visiting scientist at the Commonwealth Scientific and Industrial Research Organisation (CSIRO). That time has come and gone, and my family and I have been back in Wyoming for the past year with a semester's worth of new perspectives, relationships, and ideas to continue to reflect on.

Working alongside CSIRO researchers Nikki Dumbrell, Katie Ricketts, and others, I had the chance to experience a major national science institution from the inside — one that draws scientists from all over the world and offers a truly international vantage point on the research we do here at home. The experience wasn't without its challenges (including one particularly memorable, and slightly mortifying, interaction with the Governor-General that I'll happily tell you about over a beverage sometime), but it was, without question, one of the most rewarding chapters of my career and personal life.

Professionally, I was struck by how many of the challenges facing rural Australia mirror what we see across the American West — from retaining young people in rural and regional communities to finding ways to boost agricultural productivity while conserving natural resources. I also had the opportunity to dig into Australia's experience as a global leader in environmental markets, including the country's new national Nature Repair Market policy. While Australia has years of hard-won experience navigating these markets, it was clear that even the most established programs continue to wrestle with the nuance, complexity, and tradeoffs inherent to environmental markets — lessons directly relevant to our own work here. Many of these insights came over excellent cups of coffee (Aussies are very proud of their coffee), meeting with environmental experts and researchers from across the country.

On a personal level, while the experience certainly came with its emotional ups and downs, it was a gift for our whole family. Our kids attended school in Canberra, we learned about Australia's rich Indigenous history and culture, and we spent as much time as we could exploring the country's natural areas and wildlife — including some truly spectacular birds. Snorkeling the Great Barrier Reef was a particular highlight that came with the physical sensation of my jaw dropping as I saw its corals up close for the first time. I'm grateful for the experience and know it will continue to shape my teaching and research for years to come, and I look forward to staying connected with the friends and collaborators we made along the way.

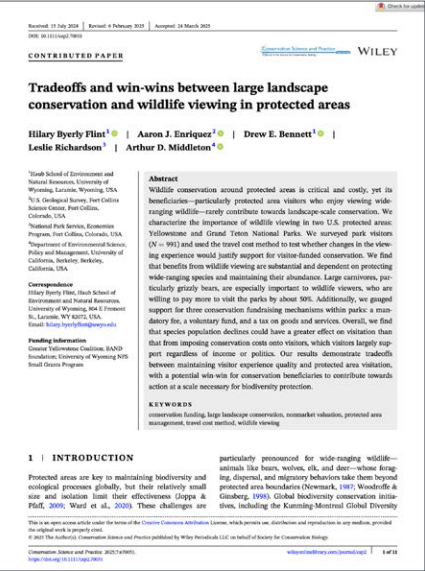


Featured Pulications

TRADEOFFS AND WIN-WINS BETWEEN LARGE LANDSCAPE CONSERVATION AND WILDLIFE VIEWING IN PROTECTED AREAS

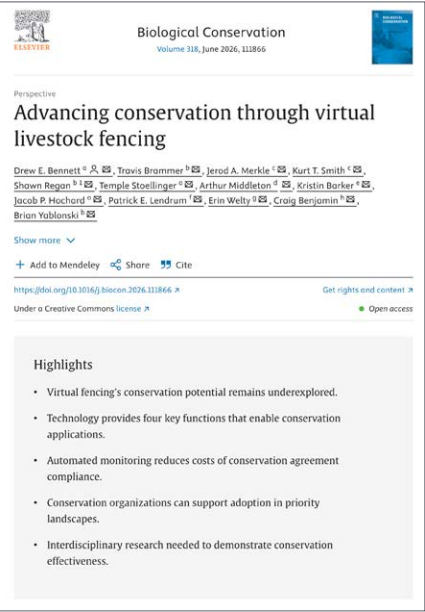
Millions of visitors come to Yellowstone and Grand Teton National Parks each year and opportunities to view grizzly bears, wolves, and elk are primary draws. Yet, the conservation needs of these wide-ranging wildlife extend well beyond park boundaries and into the broader mosaic of public and private lands in the ecosystem. In this study, we surveyed nearly 1,000 park visitors to estimate that wildlife viewing is worth roughly half a billion dollars to national park visitors each year. Grizzly bears and other large carnivores are especially prized—visitors who prioritize seeing these species are willing to pay about 50% more to visit. Nearly half of all visitors said they'd take fewer trips if wide-ranging wildlife became harder to see. Most visitors also supported the concept of a mandatory conservation fee or voluntary donation fund at park entrances to raise funds for conservation actions outside the parks.

The full open-access publication is available in the journal Conservation Science and Practice: <https://conbio.onlinelibrary.wiley.com/doi/pdf/10.1111/csp2.70051>



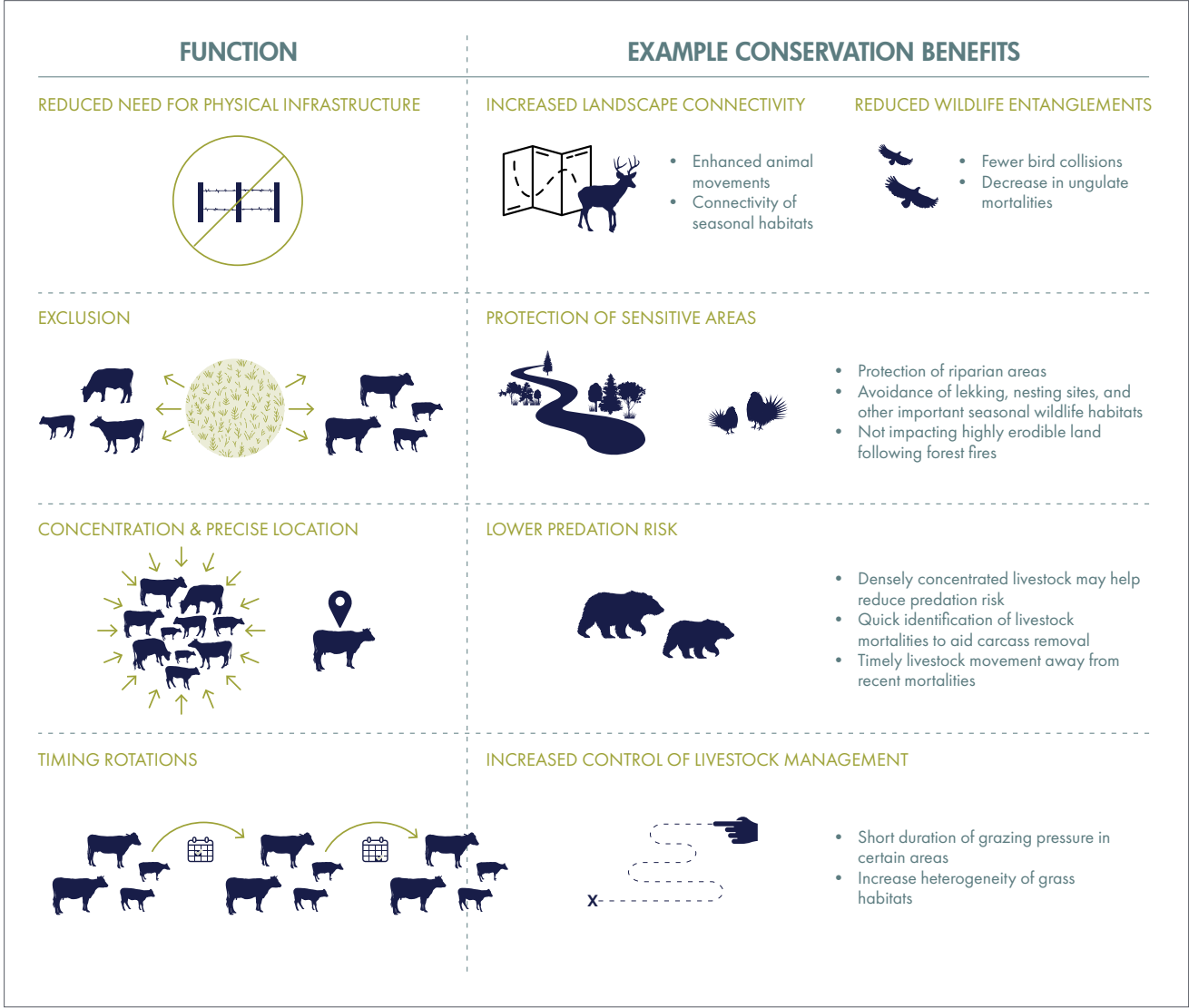
ADVANCING CONSERVATION THROUGH VIRTUAL LIVESTOCK FENCING

Virtual fencing has the potential to not only transform ranching, but also conservation on rangelands. This paper highlights four key functions that virtual fencing offers to advance conservation: removing physical fences that fragment habitat and injure wildlife, precisely excluding livestock from sensitive areas like riparian zones or nesting sites, concentrating livestock to control invasive species or reduce predator conflict, and enabling flexible grazing rotations that build habitat diversity. These functions could help restore landscape connectivity, protect vulnerable habitat, and ease long-standing tensions between livestock production and wildlife. Adoption still faces meaningful hurdles including battery life and cost, animal welfare considerations, data privacy concerns, and steep learning curves for both producers and livestock. Conservation organizations can help address these hurdles by cost-sharing technology in exchange for conservation-focused implementation, building virtual



fencing into innovative conservation agreements, and advocating for policies that make it eligible for the same support traditional wildlife-friendly fencing receives.

The full open-access publication is available in the journal Biological Conservation: <https://www.sciencedirect.com/science/article/pii/S0006320726001771>



The paper highlights four key functions of virtual fencing that support conservation oriented livestock management.

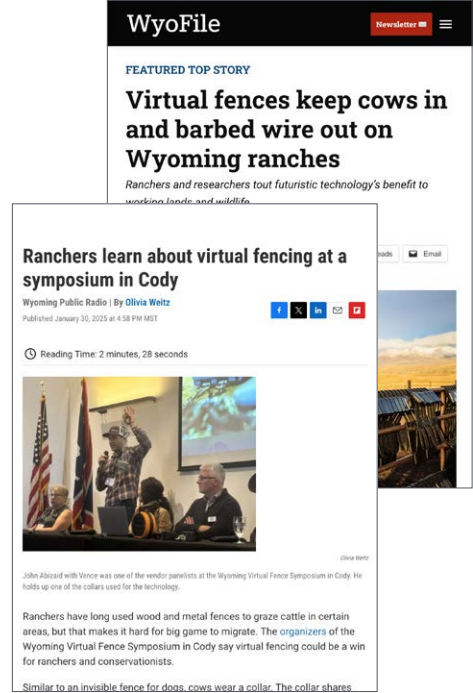
Other Program News

MacMillan Program team members and work was highlighted in several media pieces:

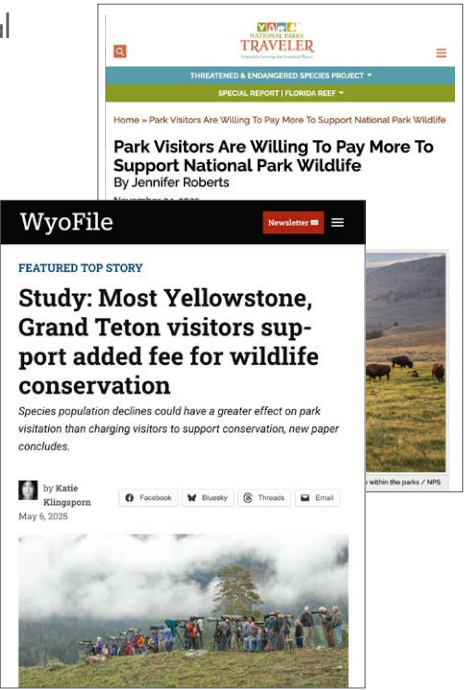
Hilary Byerly Flint’s research on national park’s visitors support for funding transboundary conservation was highlighted in several news outlets including:

- National Parks Traveler’s piece [“Park Visitors Are Willing to Pay More To Support National Park Wildlife”](#)
- WyoFile’s [“Study: Most Yellowstone, Grand Teton Visitors Support Added Fee for Wildlife Conservation”](#)

Several media outlets highlighted ongoing work related to virtual fencing’s application to environmental conservation efforts including MacMillan alum, Travis Brammer, and Drew Bennett’s ongoing research efforts:



- The New York Times feature [“Wyoming Cowboys Are Breaking Down Barriers, Literally”](#) highlighting Travis’s pioneering work to test the efficacy and viability of the tool.
- WyoFile’s [“Virtual Fences Keep Cows In and Barbed Wire Out on Wyoming Ranches”](#) featuring ongoing research on the technology’s potential in conservation.
- Cowboy State Daily Show with Jake highlighting the insights from the recent publication [“Advancing Conservation Through Virtual Livestock Fencing”](#) (interview begins at 2:24:00)
- Wyoming Public Radio’s [“Ranchers Learn About Virtual Fencing at a Symposium in Cody”](#) highlighting Callie Berman’s and Travis’s outreach efforts to share lessons with producers along the Absaroka Front — a symposium co-sponsored by the MacMillan Private Land Stewardship Program with financial support from the Alumbra Innovations Foundation.



Graduate Student Thesis Defenses

Two graduate students, Katie Doyle and Jocelyn Wulf, successfully defended their theses. Katie’s thesis, “Beyond the Bounds: A Study of Cross-Boundary Collaboration to Conserve Mule Deer, Pronghorn, and Elk Migration Corridors in Wyoming” was a key piece of the MacMillan Program’s study of the USDA-Wyoming migratory big game initiative. Drawing on interviews with federal and state agency representatives, tribal members, non-governmental organization personnel, and private landowners across five priority areas in Wyoming, the thesis examined how partners can work together across jurisdictional boundaries to conserve seasonal migration routes for Wyoming’s iconic big game species.

Jocelyn’s thesis, “Lessons in Innovation: Natural Capital Investments in the American West” presented a comparative analysis of four natural capital investment initiatives across the region, examining their financing structures, governance models, and ecological and economic outcomes. Drawing on stakeholder interviews and project documents, the thesis compared efforts including a forest resilience bond funding wildfire risk reduction, a conservation easement integrated with carbon market participation, a pay-for-success wildfire mitigation model, and a voluntary aquifer recharge initiative. The findings point to the importance of blending capital sources, building trust through credible science, and leveraging social capital and scale to sustain conservation outcomes — offering a nuanced picture of when and how natural capital investments can succeed.



Recent Publications from the Team

Bawa, R., D. Bennett, W. Y. Siu, B. Kirkland, D. Finnoff, and J. Hochard. 2026. Decomposing shadow prices under climate-driven growth scenarios: Insights from an elk herd case study. *Natural Resource Modeling* 39(2): e70034. <https://doi.org/10.1111/nrm.70034>

Bennett, D. E., T. Brammer, J. A. Merkle, K. T. Smith, S. Regan, T. Stoellinger, A. Middleton, K. Barker, J. P. Hochard, P. E. Lendrum, E. Welty, C. Benjamin, and B. Yablonski. 2026. Advancing conservation through virtual livestock fencing. *Biological Conservation* 318, 111866. <https://doi.org/10.1016/j.biocon.2026.111866>

Bennett, D. E., and J. Wulf. 2025. Investing in Natural Capital: Lessons from the American West. University of Wyoming, Laramie, WY: Ruckelshaus Institute of Environment and Natural Resources. <https://wyoscholar.uwyo.edu/items/92d3e599-b413-4bef-bff9-76e48f71dd59>

Berman, C., and Y. Darnenova. 2025. Nomadic roots of sharing: a case study of the Kazakh Sharing Economy. *Business & Society*. <https://doi.org/10.1177/0007650325136416>

Byerly Flint, H., and D. Bennett. 2024. Living with Elk, Mule Deer, and Pronghorn: Landowner Experiences with Big Game across Wyoming. University of Wyoming, Laramie, WY: Ruckelshaus Institute of Environment and Natural Resources. <https://www.uwyo.edu/haub/files/docs/landowner-exp-big-game.pdf>

Byerly Flint, H., A. J. Enriquez, D. E. Bennett, L. Richardson, and A. D. Middleton. 2025. Tradeoffs and win-wins between large landscape conservation and wildlife viewing in protected areas. *Conservation Science and Practice* 7(6): e70051. <https://doi.org/10.1111/csp2.70051>

Tallent, N. 2025. Tools for Landowners to Have Public Trails on Their Private Lands. University of Wyoming, Laramie, WY: Ruckelshaus Institute of Environment and Natural Resources. <https://www.uwyo.edu/haub/files/docs/ruckelshaus/pubs/public-trails-private-lands-handbook.pdf>

Urzedo, D., N. P. Dumbrell, C. J. Robinson, K. Ricketts, L. Walker, and **D. Bennett.** 2025. Pathways for advancing social measures in land stewardship decisions. CSIRO, Brisbane, Australia. https://research.csiro.au/vsfsp/wp-content/uploads/sites/441/2021/11/CSIRO-Social-Intel-Toolkit_20250922.pdf



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