

Western Confluence

Fall 2018 Issue 9

NATURAL RESOURCE SCIENCE AND MANAGEMENT IN THE WEST

PEOPLE ON PUBLIC LANDS

Our Federal
Lands Legacy

Small Towns
Court Public
Lands
Recreation

A Cabin in the
Red Desert

New Science
Reveals
Wild Horse
Secrets

The Sagebrush
Rebellion
Lives On



UNIVERSITY
OF WYOMING

Western Confluence

Melinda Harm Benson, Publisher
Emilene Ostlind, Editor
Nicole Korfanta, Associate Editor
Tana Stith, Graphic Designer
Jessica Perry, Web Designer

Advisory Board

Julia Stuble, Guest Advisor
Anne MacKinnon
Chris Madson
Gregory Nickerson
Randy Teeuwen

Haub School and Ruckelshaus Institute

Drew Bennett, Professor of Practice
Melinda Harm Benson, Dean
Colleen Bourque, Administrative Associate
Maggie Bourque, Associate Lecturer
Kit Freedman, Project and Outreach Coordinator
Mandy Gifford, Academic Advising Manager
Joe Holbrook, Assistant Professor
Nicole Korfanta, Ruckelshaus Institute Director
Amanda Korpitz, Special Events Planner
Melanie Matthews, Academic Advisor
Dan McCoy, Recreation and Tourism Degree Coordinator
Kimberly Messersmith, Business Manager
Kevin Monteith, Assistant Professor
Emilene Ostlind, Editor
Steve Smutko, Spicer Chair in Collaborative Practice
Temple Stoellinger, Assistant Professor
Doug Wachob, Academic Programs Director
Jessica Western, Collaboration Program Director

Supporting Partners

This issue of *Western Confluence* is supported by generous contributions from Dick and Mary Lou Taggart, Liliane and Christian Haub, Gilman and Margaret Ordway, and the Walton Family Foundation.

Contact Us

Western Confluence is published by the Ruckelshaus Institute of Environment and Natural Resources at the University of Wyoming, helping communities address environmental and natural resource challenges.

wyo.edu/haub/ruckelshaus-institute

Twice a year, *Western Confluence* magazine brings you on-the-ground, science-based stories about the interdisciplinary, collaborative solutions to our toughest natural resource challenges.

westernconfluence.org
Western Confluence
Ruckelshaus Institute
University of Wyoming
804 E Fremont St
Laramie, WY 82072
(307) 766-2604
editor@westernconfluence.org

EDITOR'S NOTE

By Emilene Ostlind

Here in the West, we ask a lot of our public lands. As the photo collages on the cover and to the right illustrate, we pile demands onto the federal and state lands that surround our communities. These places must provide habitat, sustain wildlife, and protect endangered species; support grazing; produce oil, gas, coal, minerals, and timber; house renewable energy infrastructure; keep watersheds flowing; give us scenic vistas to enjoy and photograph; help us connect with history; and, importantly, harbor the places we love to camp, hunt, hike, run, fish, drive ATVs, ride mountain bikes, rock climb, ski, snowmobile, watch birds, paddle canoes, and much more. Despite the huge extent of these lands, the desires we place on them frequently overlap, in sometimes messy and confusing ways. And as the population of western states continues to grow—and increasingly mobile populations visit from other parts of the country and world—the pressures on these lands will only increase.

In this issue of *Western Confluence*, we examine how everyday people like you and me interact with the 400 million (plus or minus) acres of federally and state-managed public lands that make up more than half of the surface of the 11 contiguous western states. The following stories consider what our experiences on these western lands mean to us. This issue is less about industry and resource extraction (look at our past issues on energy development, water, forests, and other topics for stories about that) so much as it is about citizens' personal experiences on public lands.

For example, writer Emily Reed dives into a surprising study from the University of Wyoming's Business Marketing and Management Department about how people "consume" experiences on Bureau of Land Management lands. Gayle Irwin investigates the ways local resistance to a national monument changed to support over the years. Kit Freedman examines how some small towns in the west are looking to diversify their economies through recreation, which requires getting the right structures in place—from trails to taxation. And Ann Stebner Steele shares an essay about her family's secret spot in Wyoming's Red Desert, and what it's meant to generations of her family to access one certain patch of public land over the years.

Additional stories in this issue—by Josh Morse about human perspectives of mule deer migration, by Steve Smutko about Wyoming's effort to find permanent designations for wilderness study areas, and by R. McGregor Cawley about the never-ending Sagebrush Rebellion—touch on the difficulty of finding agreement about the highest and best use of our public lands. But it's not only how we use these lands. Public lands provide more than resources and services. They're also the places where we have life-changing moments, from first hunts to nights alone under the stars contemplating the universe, from marriage proposals to seeing our kids connect with the natural world. To that end, public lands management for the future is both about handling overlapping uses and about sustaining the human experiences we can't get anywhere else.

On the cover and above: We asked artist June Glasson, the 2018 Ruckelshaus Institute Communications Fellow, to create an image emphasizing all the demands we put on our public lands. In response, she chopped up old magazines and glued together the images to create this photo collage. See more of her interpretations of western people and places at juneglasson.com.



Editor's Note

Emilene Ostlind



OUR PUBLIC LANDS LEGACY

- 02 **Federal Lands in Public Hands**
The long history of Congressional intent to retain federal lands
Temple Stoellinger
- 04 **Your Federal Public Lands**
Infographic
Kristen Pope and Emilene Ostlind
- 06 **Why We Have Federal Land**
The citizens and leaders behind our public land heritage
Chris Madson
- 08 **National Monuments and Local Concerns**
What it means to have protected public lands in your backyard
Gayle Irwin



PEOPLE ON PUBLIC LANDS

- 12 **Banking on Trails**
Laramie could be the next western town to cash in on public lands recreation
Kit Freedman
- 17 **Consuming Experiences Instead of Stuff**
What quiet recreationists bring to the outdoor economy and how to reach them
Emily Reed
- 19 **A Different Kind of Map**
Social science reveals the contours of wildlife migration's human dimensions
Joshua Morse
- 23 **What to Do with Wilderness Study Areas**
A collaborative stakeholder group negotiates a solution
Steve Smutko



REFLECTION

- Belonging** | 27
An essay
Ann Stebner Steele

WORKING PUBLIC LANDS

- Where Domestic Sheep Still Roam** | 30
A court case challenges domestic sheep grazing on national forests
Marissa Fessenden
- Sharing Fences** | 33
Local knowledge guides research across public and private lands
Lauren Connell and Courtney Duchardt
- Bullies on the Range** | 36
Wild horses are winning out over wildlife in the struggle for water
Nicole Korfanta
- Tracking Wild Horses** | 39
Technology addresses an old rangeland challenge
Jacob D. Hennig
- One Steppe** | 41
New tools to improve management of Wyoming's sagebrush steppe ecosystem
Michael Curran, Nicholas Graf, Jana White, Amanda Withroder, and Peter Stahl

CURRENTS

- News and Happenings from the Ruckelshaus Institute** | 43
Celebrating 25 years, *Wild Migrations* book published

UPSTREAM

- Rebel Yell** | 45
Why the Sagebrush Rebellion didn't end with Malheur
R. McGreggor Cawley

FEDERAL LANDS IN PUBLIC HANDS

The long history of Congressional intent to keep public lands public

By Temple Stoellinger

Bob Keiter is the Wallace Stegner Professor of Law, University Distinguished Professor, and Director of the Wallace Stegner Center of Land, Resources, and the Environment at the University of Utah S. J. Quinney College of Law. He is a leading national expert on public land and natural resources law and the author of *To Conserve Unimpaired: The Evolution of the National Park Idea*; *Keeping Faith with Nature: Ecosystems, Democracy, and America's Public Lands*; and *The Wyoming State Constitution* along with other books, book chapters, and law review articles. Prior to teaching at the University of Utah, Professor Keiter served for 15 years on the faculty of the University of Wyoming College of Law and was also a member of the Haub School Advisory Board.

As the Director of the Stegner Center, Professor Keiter recently co-authored four legal white papers on the transfer of public lands movement (available at law.utah.edu/research/stegner). I interviewed Professor Keiter to learn more about the legal and historical background underlying this movement.

Western Confluence: Why do we call federal land "public land"?

Bob Keiter: The term "public land" has been around since the

beginning. It reflects the fact that under our constitutional scheme, Congress is elected by the people and is representative of them. Congress has the power under the constitution over the federal lands; therefore, the general public is the ultimate owner of federal lands, and thus, public sentiment drives federal public land policy.

The notion of public sentiment driving public land policy has been more recently reflected in a variety of Congressional acts including the National Environmental Policy Act, the Federal Land Policy and Management Act, and the National Forest Management Act—all of which provide multiple opportunities for public engagement and public involvement in planning and decision making regarding federal lands. It is quite clear that Congress regards public engagement in these types of decisions as a critical part of resources management today.

WC: Did Congress intend to maintain ownership of federal lands?

BK: Over history, Congress never has just one policy intention. Different Congresses have different intentions, and how Congress approaches issues like public lands evolves and changes over time in response to the

circumstances that Congress is confronted with.

Early on, Congress was inclined to dispose of federally owned public lands in order to promote settlement and development and expansion. It did so through a whole variety of laws including homesteading laws and the like.

But, also early on, Congress decided that some of these lands merited retention in federal ownership and began to do that with establishment of the national parks and national forests during the latter part of the nineteenth century.

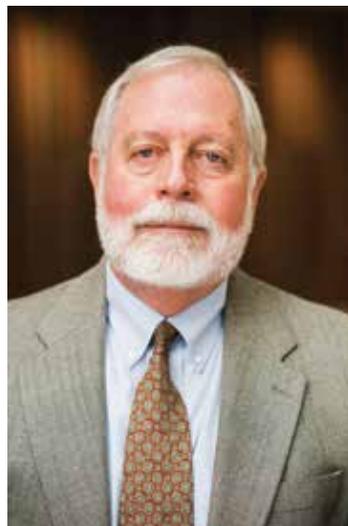
WC: How has Congressional intent regarding public lands evolved?

BK: Congress's disposal policy carried forward into the 1930s when we hit the Great Depression and a severe drought—the Dust Bowl—gripped the country. During that time, it became evident that most of the attractive federal lands in the West had been acquired by settlers and there was little new homesteading. It also became evident that there was a need for more rigorous management in order to protect resources and promote economic development.

Congress and presidents started withdrawing more federal lands, and in 1976 Congress passed the Federal Land Policy and Management Act, which explicitly said that from that point on, the federal government would retain public lands in federal ownership and oversee and regulate them to promote multiple uses.

Supporters of the transfer of public lands movement argue that Congress never intended to keep so much federal public land and that those lands should be transferred to the states. Do public lands rightfully belong to the states or the federal government?

Federal public lands were initially acquired by the federal government during the 19th century, principally through treaties with foreign nations



Bob Keiter, University of Utah
S. J. Quinney College of Law

that previously claimed those lands. Federal ownership continued through territorial status and statehood. Western states never owned or had a claim of ownership to these lands. Underlying all of this was the notion, which drove Congress from the outset of the nation, that these lands had been acquired by the blood and treasure of the nation as a whole and hence belonged to the nation as a whole. In fact, the federal government was under no obligation to provide lands to the western states upon statehood, but it did in the form of school trust lands to promote a national public education policy.

WC: *How does the recent transfer of public lands movement relate to the sagebrush rebellion?*

BK: Since the 1970s, when a presidential administration adopts policies that impose additional regulatory restraints on the use of federal lands, or tilts policy in the direction of conservation on federal lands, some Western states and residents have pushed back against that basic policy choice in the form of movements like the sagebrush rebellion. The sagebrush rebellion was the first modern manifestation of this sort of federal/state conflict over the federal lands. It arose after the adoption of the Federal Land Policy and Management Act and the additional regulations that it imposed regarding things like livestock management on public lands, the recognition of wilderness as an acceptable use on BLM public lands, and other provisions that were regarded as making it more difficult for ranchers or imposing additional regulations for development purposes.

WC: *How have the sagebrush rebellion and similar movements evolved through time?*

BK: The movement has taken different tacks over time. The sagebrush rebellion was based on the argument that the states rather than the federal government own

Underlying all of this was the notion ... that these lands had been acquired by the blood and treasure of the nation as a whole and hence belonged to the nation as a whole.

—Bob Keiter

these lands, a proposition soundly rejected by the courts. The 1990s saw the growth of the wise-use movement. Wise-use movement supporters argued that state and local governments were entitled to control or dictate policy on the public lands and that the federal land managers would have to adhere to local preferences. Again, that notion was soundly rejected by the courts at the time. More recently, during the Obama administration, we saw the rise of the transfer of federal lands movement, which was predicated upon the idea that there somehow was an obligation on the part of federal government in the original statehood acts to transfer the ownership of federal public lands to the states. That argument has not really gone anywhere politically or in the courts. Although the State of Utah has threatened to sue, it has thus far not filed a lawsuit and seems at the moment inclined to back away from litigation and to seek a political remedy during the Trump administration.

WC: *Could Congress decide to transfer some or all of the public lands to the states?*

BK: Yes, Congress has broad authority over the federal lands by virtue of the Property Clause found

in Article 4 of the Constitution. The Property Clause has been interpreted by the courts to grant broad authority—“without limitation,” according to the Supreme Court—to Congress to decide what to do with the federal lands including whether to retain them in federal ownership, to preserve them in national park or wilderness status, to lease them, or to dispose of them. If Congress could be persuaded, it could convey the federal lands to the states.

WC: *Is that scenario likely?*

BK: I don't think so, for a number of reasons. It is quite difficult to get any kind of legislation through Congress generally and this specific type of legislation would incur an awful lot of opposition. I suspect the opposition would not be solely along partisan lines. Federal lands are an extraordinary asset to the nation as a whole and, among other things, generate substantial revenues for the treasury primarily through energy development. I don't know why in this era of budget deficits, a representative from an eastern or a southern state would agree to just transfer those lands to Utah or some other western states.

WC: *Do you have concerns about the transfer of public lands Movement?*

BK: What worries me most is that it diverts attention away from the difficult resource planning and allocation issues that we face on federal lands and undermines the opportunity to collaborate locally to try to resolve some of these issues. It holds out the false hope that somehow there is a legal argument that would result in the transfer of these lands when that is highly unlikely.

WC: *What would be the impact to states if federal lands were transferred?*

BK: As a result of the interest that the Utah legislation generated, a number of other states adopted somewhat similar legislation, several of which called for studies of what the economic implications of transfer of federal lands to the states would be. Pretty much across the board, the conclusion was that it would be a net economic loss to the states rather than a gain. The only way it could potentially pencil out is if the minerals were transferred along with the surface ownership, which is highly unlikely given the long history of the federal government reserving mineral rights even when it earlier conveyed land to the states. Even if the minerals were transferred, it would still be very hard for the bottom line to work out positively given the costs that the states would have to assume.

At the end of the day, to try to make this work out economically, states would have tremendous incentive to either pursue all-out development on these transferred lands, or resort to selling them, which would take them out of public ownership and change the character and culture of the West.

Temple Stoellinger is a faculty member in the University of Wyoming Haub School of Environment and Natural Resources and the College of Law.

Your Federal Public Lands

By Kristen Pope and Emilene Ostlind

The United States of America is unique in the world for its vast system of federal public lands, which make up more than a quarter of the country's land area. Those federal lands, mostly concentrated in the 11 westernmost states and Alaska, span everything from rivers and canyons to sagebrush steppe and alpine peaks. They include protected national parks and monuments as well as productive energy fields and expansive rangelands. They host fish and wildlife habitat, timber production, the watersheds that supply our cities, and an ever-expanding range of recreational experiences.

Federal lands are a source of both experiences and resources. In 2017, companies paid more than \$6.9 billion for resources extracted from federal lands, mostly oil and gas. That money goes to the states and American Indian tribes; to the General Treasury; to the Reclamation, Land and Water Conservation, and Historic Preservation Funds; and elsewhere.

Here's a breakdown of our federal public lands for reference as you read the rest of this issue.

FOREST SERVICE

Established

1905



193

million acres

2018 Budget

4.7

billion

MISSION

To sustain the health, diversity, and productivity of the nation's forests and grasslands to meet the needs of present and future generations

USES

- Forest research, management, and products
- Forest and watershed restoration
- Minerals management
- Wildlife, rare plants, and native vegetation habitat
- Livestock grazing
- Recreation
- Wildland firefighting

UNITS

- 154 national forests
- 20 grasslands

LOCATION

43 states and Puerto Rico

30,000

employees



BUREAU OF LAND MANAGEMENT

USES

- Outdoor recreation
- Livestock grazing
- Mineral development
- Energy production
- Hunting and fishing
- Protecting cultural, historic, and natural resources

Established

1946



UNITS

- 10 percent of US lands and 30 percent of US minerals
- National conservation lands including
 - ◊ 27 national monuments
 - ◊ 21 national conservation areas
 - ◊ 223 wilderness areas

MISSION

To sustain the health, diversity and productivity of the public lands for the use and enjoyment of present and future generations

LOCATION

Mostly western US and Alaska

248

million acres
(700 million subsurface)

10,000

employees

2018 Budget

1.1

billion

FISH AND WILDLIFE SERVICE

Established
1940

2018 Budget
2.8
billion



856
million acres
(some jointly managed)

- 19 million in the continental US and Hawaii
- 77 million in Alaska
- 760 million in American territories/islands in the Atlantic and Pacific

MISSION

To work with others to **conserve, protect and enhance** fish, wildlife, and plants and their habitats for the continuing benefit of the American people

USES

- Protecting endangered species, migratory birds, and fish
- Protecting wetlands
- Hunting, fishing, birdwatching, and other recreation

LOCATION

50 states and territories

9,000
employees

UNITS

- 560 national wildlife refuges
- 70 national fish hatcheries
- More than 36,000 waterfowl production areas
- 86 field stations

NATIONAL PARK SERVICE
Department of Interior



USES

- Scenery
- Protecting cultural, natural, and historic resources
- Protecting wildlife
- Outdoor recreation
- Historic preservation

MISSION

To preserve unimpaired the natural and cultural resources and values of the National Park System for the enjoyment, education, and inspiration of this and future generations

LOCATION

50 states and territories

Established
1916

over
20,000
employees

84
million acres

UNITS

Over 400 units including

- national parks
- national monuments
- historic sites
- lakeshores
- battlefields
- scenic rivers

2018 Budget
2.6
billion

BUREAU OF RECLAMATION



Established
1902

over
5,400
employees

LOCATION

17 states

MISSION

To **manage, develop, and protect** water and related resources in an environmentally and economically sound manner in the interest of the American public

USES

- Providing water
- Hydroelectric power

UNITS

- 338 reservoirs
- 600+ dams constructed
- 53 power plants
- 289 recreation sites (with partners)
- 558 campgrounds

6.57
million acres

2018 Budget
1.1
billion

By Chris Madson

On June 30, 1864, the US Senate approved a grant of federal land to the state of California, a tract in the Sierra Nevada at the headwaters of the Merced River “known as the Yosemite valley... with the stipulation... that the premises shall be held for public use, resort, and recreation... for all time.”

Up until that summer day, the federal government had been committed to the idea that all the land it obtained, either by conquest, treaty, or purchase, was to be broken up and conveyed to individual owners. The Yosemite grant was the first tangible expression of a different philosophy of public land management—the idea that the people of America might want to hold onto some federally owned land for their collective use and enjoyment.

The idea began to emerge in the American consciousness a generation or more before Yosemite was created. As early as 1833, the artist George Catlin traveled to the Mandan villages in what is now North Dakota, where he saw the great herds of bison and the societies they supported on the way

to extinction. It was Catlin who first made the proposal: “... a magnificent park, where the world could see for ages to come, the native Indian in his classic attire, galloping his wild horse, with sinewy bow, and shield and lance, amid the fleeting herds of elks and buffaloes.”

Nearly forty years after Catlin broached his grand idea and eight years after Yosemite became a park, a coalition of local boosters and railroad interests petitioned Congress for another reservation on federal land. This one was much larger than Yosemite—more than 3,000 square miles—and, since there were no states in the region, it was to be managed by the federal government. President Ulysses S. Grant signed the bill to create the park on March 1, 1872. Yellowstone National Park—“for the benefit and enjoyment of the people”—was the first of its kind in the world, a new idea invented by a new nation.

As isolated as it was, Yellowstone began drawing tourists as soon as it was established. Three hundred came in 1872, and in 1890, nearly 8,000

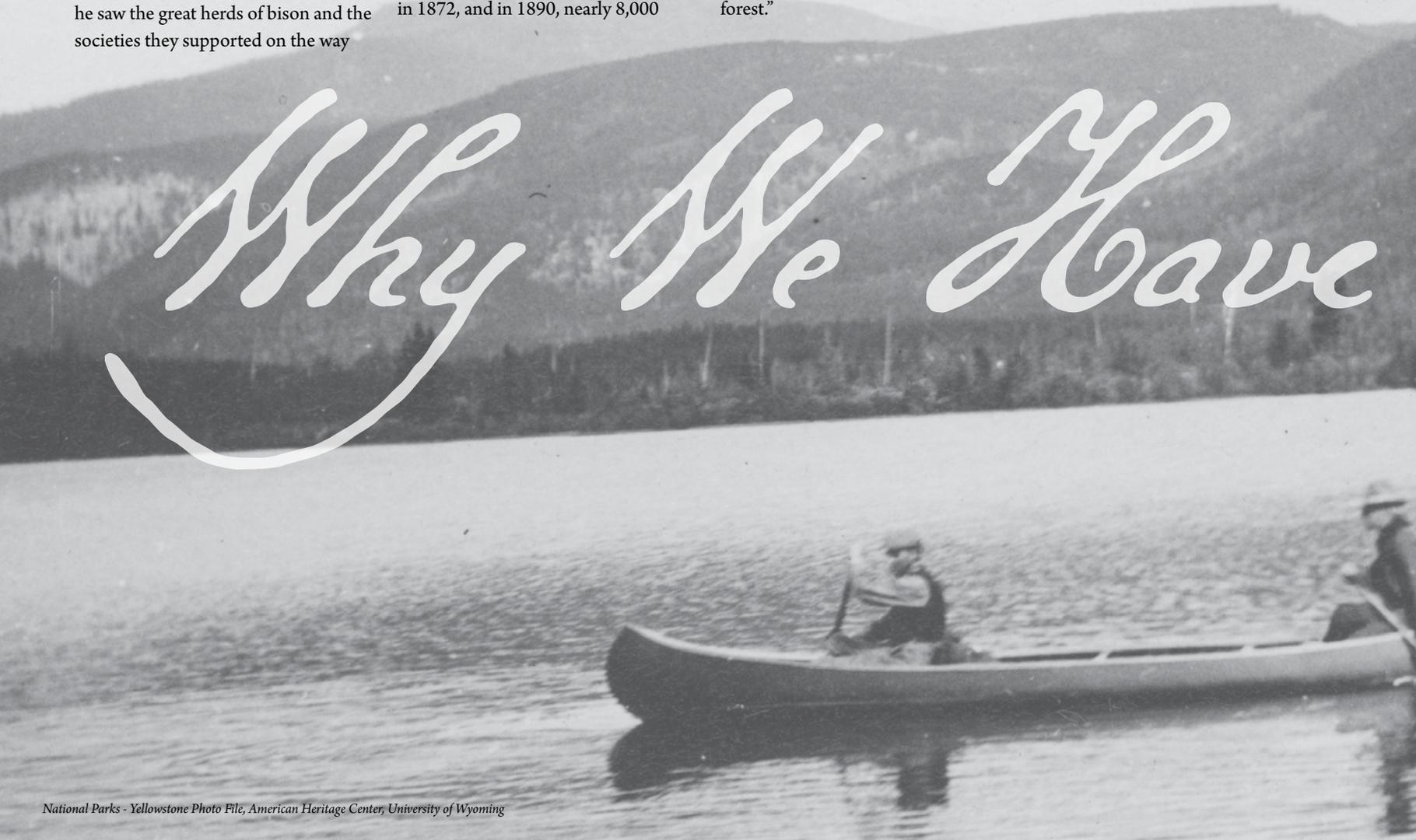
made the trek. The park was often front-page news as the eastern public followed the controversies over the management of its wildlife and natural features and adequate oversight and enforcement were established.

While the concept of the national park as a pristine reserve for public recreation was evolving, the country began to consider other models for protecting federal lands as well. In 1873, Franklin Hough, a New York doctor with a deep interest in the emerging science of forestry, took the podium at the annual meeting of the American Association for the Advancement of Science. In his address, “On the Duty of Governments in the Preservation of Forests,” Hough cataloged the problems that overharvest of timber can cause and discussed the national forest systems in several European countries. He offered several suggestions for the improvement of forest management in the United States, the first being “withholding from sale such wild and broken lands... so as to preserve the tract as a forest.”

In 1874, Secretary of the Interior Columbus Delano expressed his concern over “the rapid destruction of timber” on public lands and insisted that, unless some sort of legislative protection was adopted, all the trees of any value would be gone.

The views of men like Hough and Delano reflected a growing public dismay over the unsustainable removal of timber and other resources from federal lands. In 1891, this concern led to the establishment of the federal Division of Forestry, forerunner of the US Forest Service. While the new division demonstrated Congressional interest in sustainable use of the public’s land, it had no authority to curb abuses on federal holdings. Its primary focus was selling the importance of proper management of the nation’s forests.

Also in 1891, President Benjamin Harrison created the Yellowstone National Park Timberland Reserve, a 1.25-million-acre tract of montane forest and alpine meadows intended largely to protect elk summer range south and east of Yellowstone National



Why We Have

Park. It was America's first national forest. He quickly set aside fourteen more forest reserves, a total of 13 million acres that would serve as the nucleus for the national forest system. Almost as an afterthought, he also established Afognak Forest and Fish Culture Reserve in Alaska's Aleutian Islands, the first reserve in what would later become the national wildlife refuge system.

Thumbnail histories of public lands in America often begin with Teddy Roosevelt's presidency, as if the concept of federal reserves had sprung, fully formed, from the minds of Roosevelt and his forestry advisor, Gifford Pinchot. It's certainly true that Roosevelt and his mentors were deeply committed to the idea of preserving wildlife and wild land as well as to the more utilitarian precepts of wise use of timber, water, and forage, but an examination of history clearly shows that the philosophy that would eventually lead to national parks, forests, and grazing lands had

begun to develop before Roosevelt was even born. Included in that suite of ideas was the notion that the people were sovereign, endowed with the same rights the monarchs of the Old World had once held. Together, the American people owned the wildlife that roamed across the nation and could hold common title to the kind of parks and game reserves that in Europe had been the prerogative of the aristocracy.

Roosevelt was not only a committed conservationist but an astute politician who understood the public's views and values better than any other man of his time. During his administration, he added 130 million acres to the national forest system; 236,000 acres in five new national parks, and 820,000 acres in eight national monuments, including Grand Canyon. Many of these new reserves stirred outrage among the nation's robber barons and their minions, but

Roosevelt based his expansion of the nation's systems of parks and forests on a canny assessment of what a large majority of the people of the United States really thought. For more than a century before Teddy took the oath of office, Americans had been considering the transformations they had wrought across vast landscapes, and they had come to value the place wildlife and wild land held in their lives.

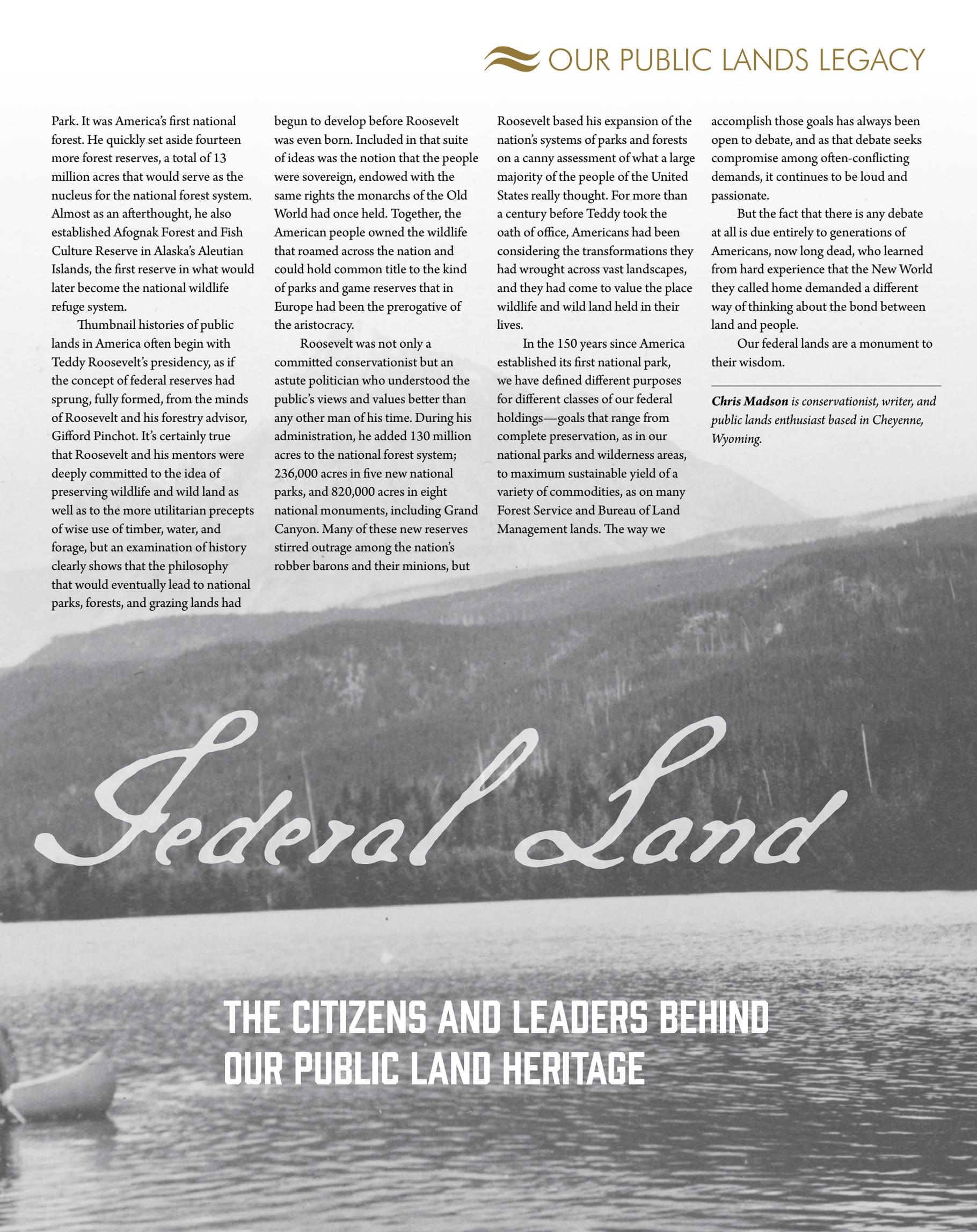
In the 150 years since America established its first national park, we have defined different purposes for different classes of our federal holdings—goals that range from complete preservation, as in our national parks and wilderness areas, to maximum sustainable yield of a variety of commodities, as on many Forest Service and Bureau of Land Management lands. The way we

accomplish those goals has always been open to debate, and as that debate seeks compromise among often-conflicting demands, it continues to be loud and passionate.

But the fact that there is any debate at all is due entirely to generations of Americans, now long dead, who learned from hard experience that the New World they called home demanded a different way of thinking about the bond between land and people.

Our federal lands are a monument to their wisdom.

Chris Madson is conservationist, writer, and public lands enthusiast based in Cheyenne, Wyoming.



Federal Land

THE CITIZENS AND LEADERS BEHIND
OUR PUBLIC LAND HERITAGE

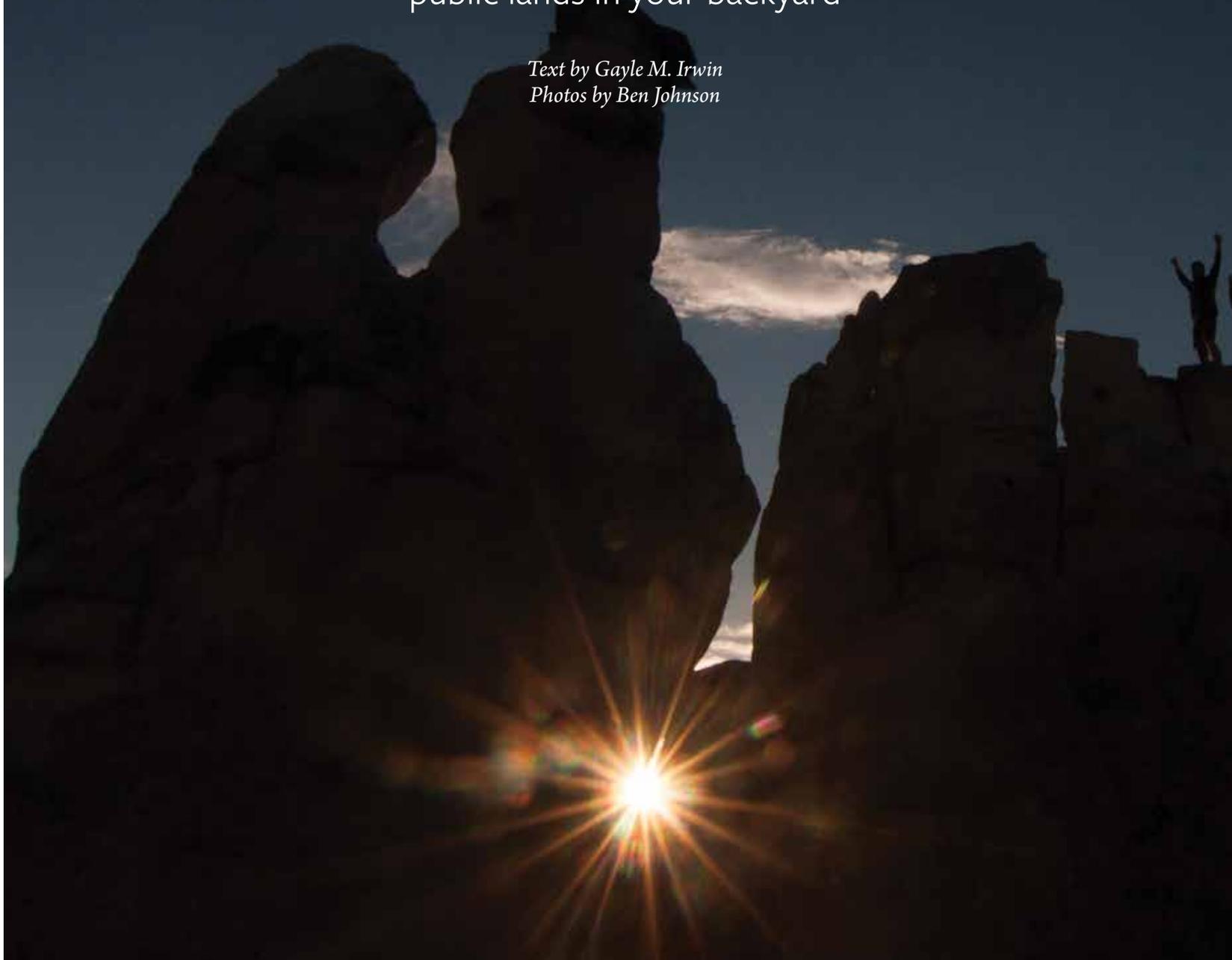
NATIONAL MONUMENTS

A N D

LOCAL CONCERNS

What it means to have protected
public lands in your backyard

*Text by Gayle M. Irwin
Photos by Ben Johnson*



“A lot of the kids are taken aback. This is in their own backyard and they’ve never been there. It’s a positive experience for us all.”

— *Laurie Baum*

Waves lap the shoreline. An endless stellar canopy shimmers in the ink-colored sky. Smoky fragrance drifts from a campfire, and 20 middle school students sit around the dancing flames. Some toast marshmallows or write and draw in journals. Ten others wash, dry, and pack away dishes from the evening meal. A few adults mingle, voices low. The night is quiet except for the whispered words and the rattling pans for those camping along the Upper Missouri River in north-central Montana.

For more than a decade, students and educators from Fort Benton and Highwood Schools have explored the wide river and the surrounding isolated Upper Missouri River Breaks National Monument. The expedition introduces youth to a natural national treasure—and much more.

“For many kids, it’s their first time camping, first time away from their parents, first time outside overnight,” said Connie Jacobs, former director of Fort Benton’s Upper Missouri River Breaks National Monument Interpretive Center, who implemented the program. “They learn a lot. Montana is a rural state, but many kids don’t have primitive outdoor experiences.”

Local teachers Renee McDonald and Laurie Baum partnered with Jacobs nearly a decade ago, taking their students into the national monument. Although Baum retired last year and Jacobs oversees a different center in another state, McDonald continues to take Fort

Benton students on the Missouri and nearby Marias Rivers. Students experience hands-on learning in subjects like biology, geology, history, and math. They also learn how to set up tents, operate a canoe, cook over a campfire, and administer first aid.

“The students are amazed,” Baum said. “They like the experience of the river. They find it so peaceful, and they learn to respect and care for the land.”

“A lot of the kids are taken aback. This is in their own backyard and they’ve never been there. It’s a positive experience for us all,” said McDonald.

Such experiences and educational opportunities were threatened last year when the Trump administration considered rescinding several national monument designations including the Upper Missouri River Breaks National Monument. For some people, that review opened wounds from 20 years ago, while many others found solidarity in the common cause to keep the monument intact.

HISTORY OF THE MONUMENT

In addition to outdoor recreation activities like canoeing, hunting, camping, fishing, and birdwatching, the Upper Missouri River Breaks National Monument is a portal into history. The region’s rugged landscape captivated the 1804–1806 Lewis and Clark expedition. “As we passed on it seemed as if those scenes of visionary enchantment would never have an end,” Meriwether Lewis wrote in his journal on May 31, 1805. Native Americans used the area to hunt bison

and other game, and the region served as refuge for the Nez Perce as they fled the US Army in 1877. Steamboats chugged upriver from growing cities like St. Louis into the frontier town of Fort Benton. Homesteaders attempted to etch out a living at the turn of the 20th century. American history, vast vistas, and diverse animal and plant life led the US Congress to protect a 149-mile stretch of the Upper Missouri River in 1976 with a wild and scenic designation.

Daily, Hugo Turek experiences the enchantment of the Upper Missouri River Breaks about which Lewis wrote. His ranch lies next to the monument, and he’s floated the wild and scenic portion of the Missouri River. He’s also been on the front line of protecting the region. In 1999, Turek met then-Interior-Secretary Bruce Babbitt, who was considering placing the area under greater protection as a national monument. They floated the river with a contingency of reporters, and, at Babbitt’s request, Turek helped set up discussions in local communities regarding monument status.

“We held four public meetings: in Havre, Fort Benton, Lewistown, and Great Falls,” he said. “They were balanced between proponents and opponents. More than 450 people came to the meeting in Great Falls.”

Afterward, Turek and other members of the Central Montana Resource Advisory Council came up with a list of more than 25 items “everyone agreed on,” including monument land remaining open for

grazing, hunting, and fishing.

“It was like a blueprint, but there were no boundary recommendations—we couldn’t agree on that,” Turek said.

The council’s list was sent to Washington, DC. Combined with Babbitt’s recommendation for area protection, in January 2000, President Bill Clinton designated nearly 378,000 acres of land as the Upper Missouri River Breaks National Monument under the auspices of the federal Bureau of Land Management. This move, done through the 1906 Antiquities Act, generated major controversy.

REACTIONS TO THE MONUMENT DESIGNATION

Boundaries were a primary thorn. Within the monument’s borders are about 39,000 acres of state land and 80,000 acres of private land. Although the landowners “can do whatever they want on their private land,” according to Josh Chase, BLM’s acting monument manager, many private property owners and others were against the monument. During the Bush administration, when Montana was under a new governor, then-Montana-Congressman Dennis Rehberg introduced legislation to redraw the monument’s boundaries in order to exclude private and state lands.

However, people had already started to accept and even support the monument. Those efforts to downsize it never got out of the House of Representatives, said Turek, who testified at committee hearings.



Three committee members wrote that Rehberg's bill, "is both bad and unworkable public policy that attempts to play on people's fears rather than dealing with the facts and as such it should be rejected by the House."

Meanwhile, a new recreation economy started to grow up around the monument. Nicole Fugere, owner of Adventure Bound Canoe and Shuttle Company in Fort Benton, began guiding people through the breaks along the Missouri River more than a decade ago. She's owned the business for two years, and in a community of less than 1,500, employs 15 to 20 people each season. The business shuttles between 2,000 and 3,500 canoeists and guides on about 120 river trips annually.

"We have increased the number of clients [served] over time," said Fugere. "People come for the Lewis and Clark experience, and they wouldn't come if it wasn't cared for, protected. The monument is huge for me."

Having the river and the monument to which she transports and services outdoor recreationists adds not only to her coffers, but also to the tax base of the community and state. Several Montanans cited

how visitation to the monument contributes to the local and state economy. "Outdoor recreation is a booming industry," said Montana musician and rancher Rob Quist, "and public lands are an economic driver for our state."

"People are curious to see the monument—it appeals to the outdoor recreationist," said Gayle Fisher, executive director for central Montana's tourism region. "The national status [of the monument] benefits communities, for it brings a little more traffic into the area. The river and the monument are part of the mix we use to market the region—it's a tool in our toolbox."

Research finds public lands, including national monuments, are good for business. According to a report issued last year by Headwaters Economics, a non-partisan research group in Bozeman, Montana, "national monuments are consistent with economic growth in adjacent local communities." That includes the small towns around the Upper Missouri River Breaks.

"People value these lands out here," Turek said. "I think the economic impact is yet to be realized."



GRASSROOTS RESPONSE TO MONUMENT REVIEW

Despite many local attitudes about the monument shifting over the years from opposition and distrust of federal oversight to acceptance and support for increased revenues from tourism, in April 2017, President Trump and Secretary Zinke announced they would review national monuments and possibly rescind some, including the Upper Missouri River Breaks. Montanans and others spoke out in great numbers, some in favor of keeping the monument and others in favor of reducing the monument's size or completely eliminating protection. Those desiring change included many area ranchers.

Citing his opinion about lack of public input during the initial designation process, area landowner and member of Missouri River Stewards Matt Knox told the Billings Gazette that he "would be in favor of overturning" the monument's status.

Others sent letters expressing concerns. Last July, the Gazette excerpted a letter from rancher Laura Boyce, who has family property within

the monument's borders. "We would like to do some estate planning," she wrote, "but are very limited out there, because who wants the half in the monument? What is the future there? Will we continue to be allowed to graze cattle?"

In response to the possibility of changes to the Upper Missouri River Breaks National Monument through the administration's review, the non-profit Friends of the Missouri River Breaks, of which Turek is a board member, partnered with state and national organizations to encourage supporters and others to become involved in the monument status discussion.

"We had good collaboration," said Tim Dwyer, executive director of the friends' group. "Working with organizations like the Wilderness Society and the Wildlife Federation helped us reach more people—they have larger memberships. Montanans see a threat to public lands; public lands are a reason we live here. Several small business owners in Fort Benton also stepped up."

One of those was Fugere.

"I could not imagine there not being a monument—it's a huge part of history," she said.



Montanans considered themselves conservationists, up from 71 percent the year before.

A MONUMENTAL EXPERIENCE

More than 2.8 million comments were submitted during the national monument review in 2017, and, according to a report summary submitted to President Trump by Zinke, they “were overwhelmingly in favor of maintaining existing monuments ...” In August 2017, a few weeks before announcing his controversial decision to downsize Bears Ears and Escalante National Monuments in Utah, Zinke recommended no changes be made to the Upper Missouri River Breaks National Monument.

This remote region of Montana, where Quist says, “you’ll experience the least amount of civilization that you can find in the world,” for now, remains unchanged. Modern explorers generate revenue for local communities and discover the knowledge, solitude, and wonder that the 1805 expedition experienced.

“What many [students] told me afterwards, even after high school or college, was that being on the river

was the best thing they’d ever done in school,” said Jacobs, who started the school river adventure. “Some I’ve met later in life have gone on to work in an outdoor setting.”

“The monument is a place for recreation, for learning,” Fort Benton educator McDonald said. “If it wasn’t a monument, we’d likely lose a lot of our history—the tepee rings, the trails, the homesteads. There’s so much history here—those stories are our stories.”

Gayle M. Irwin of Casper, Wyoming, writes regularly for *Wyoming Rural Electric News*, and has contributed stories to the *Casper Star-Tribune* and the *Chicken Soup for the Soul* books. She has won awards from Wyoming Writers, Inc., the Wyoming Press Association, and 2016’s Writing Well creative writing contest. Visit her website at gaylemirwin.com.

Ben Johnson is a freelance photographer and environmental field instructor based in Montana.

She became part of a movement called Hold Our Ground, a coalition of individuals and organizations who came together in response to the administration’s review of the Upper Missouri River Breaks National Monument. According to the organization’s website, 24,000 Montanans spoke in favor of continued protection.

“Montanans value their public lands, they truly do,” said Turek. “If we get rid of public lands, if there was no

monument, the lands would be sold off to the highest bidder—they would be owned by very wealthy people. We’re creating less and less [public] land, and people want outdoor experiences.”

A survey released in June 2017 by Colorado College, Conservation in the West, showed 77 percent of Montana residents wanted to keep existing national monuments so designated; 16 percent wanted reduction or removal. The survey also noted 78 percent of



Pilot Hill Project Area and adjacent state land

BANKING ON TRAILS

Laramie could be the next western town to cash in on public lands recreation

By Kit Freedman

On a Thursday evening last March, a crowd of eager residents packed into the gymnasium of the Lincoln Community Center in West Laramie to learn more about the Pilot Hill Project—a community-led effort to purchase 5,500 acres of rolling foothills and short-grass prairie east of town. Long desired by locals, many of whom grew to love the land when it was previously accessible with special permission from the owner, the property offers outstanding views and recreational opportunities, and would give the community the chance to permanently protect an important recharge zone for Laramie’s primary drinking water source, the Casper Aquifer. It also offers front-door access to 55,000 acres of public land in the Pole Mountain Unit of the Medicine Bow National Forest.

But with a price tag of \$10.5 million, the property isn’t exactly cheap. And what’s more, organizers of the purchase effort note that, in addition to the purchase price, the community would need to raise an additional \$4–4.5 million to pay for trails and restrooms, hire staff, and install fencing and signage.

That’s a big ask for Wyoming’s poorest county. And Laramie—with its potholed streets and buckling sidewalks—can hardly afford to keep its emergency services running, let alone come up with a sizeable contribution to help fund the purchase of property outside city limits.

“We as a city are struggling right now just to pay for basic road maintenance,” concedes Laramie Mayor Andi Summerville. “We are literally having discussions about what services we cannot provide anymore.”



Still, finding a way to pay for Pilot Hill could be important to Laramie's economic future. All throughout the West, communities are reinventing themselves and their economies by investing in expanded recreational access on public lands through projects like Pilot Hill that draw visitors, and their checkbooks, to town. The purchase could bring real money to Laramie, especially if the community's tax structure will allow it to capitalize on all that recreation can offer.

"It's really difficult to see this project that could have enormous economic benefit and have absolutely no cash to be able to help bring the project to fruition," admits Summerville.

But with the growing recognition in recent years of the outdoor recreation industry as an important driver of

economic development, many think it's an opportunity the community simply can't afford to pass up.



According to the Outdoor Industry Association, nationally, outdoor recreation generates almost \$900 billion a year in consumer spending on everything from lift tickets, guides, and lodging to equipment, food, and clothing—more than what Americans spend each year on household utilities and pharmaceuticals combined. The Colorado-based trade organization reports that in 2016, outdoor recreation supported 7.6 million jobs and contributed more than \$125 billion in federal, state, and local tax revenue. According to the Department of Commerce's Bureau of Economic Analysis, which uses a more limited economic measure than that of OIA, outdoor recreation accounted for over 2

percent of the nation's Gross Domestic Product, or \$412 billion, in 2016.

"It doesn't sound like much, but that's twice the value of automobile sales in this country," says Ray Rasker, executive director of Headwaters Economics, a Bozeman, Montana-based non-partisan think tank that's focused on improving community-development and land-management decisions. "It's bigger than mineral production of oil, gas, and coal combined."

OIA reports that outdoor recreation in Wyoming is responsible for \$5.6 billion in consumer spending annually, provides 50,000 direct jobs, and generates over \$500 million each year in state and local taxes. That's still far less than Wyoming's extractive industries like coal and oil, but amid the recent downturn in the state's energy economy, recreation has

caught the attention of state leaders who have been scrambling to diversify Wyoming's economy and break free of the boom and bust cycle that has plagued the state for the better part of the last century.

"We truly believe that this is a growth industry in Wyoming," says Nephi Cole, a policy advisor for outgoing Wyoming Governor, Matt Mead.

With nearly half of the state's total land area designated public land, and the lowest population density of any state in the lower 48, they might be on to something.



Hoping to benefit from a larger cut of the outdoor recreation economy, many in the Laramie community are excited that the Pilot Hill purchase would create new public land immediately adjacent to town.



The Pilot Hill project purchase would connect Laramie to trails in the Medicine Bow National Forest.

Data suggest that when Americans recreate outside, they typically do so on public land. According to a recent report by the Center for Western Priorities, US public lands in eleven western states see more than 290 million visits each year—equivalent to almost one visit for every person living in the United States.

“There’s something about public lands that creates a lot of economic growth,” says Rasker.

According to research by Headwaters Economics, counties in eleven western states that claim nearly half of all the nation’s public lands have since the 1970s outperformed

the rest of the country in several key economic measures. While it’s difficult to tease apart the specific source of economic growth attributable to public lands—whether from agriculture, resource extraction, or recreation and tourism—it’s telling that counties with more protected federal lands (locations where energy development and resource extraction are off limits) have seen significantly higher growth in employment, jobs, and personal income. Per capita income growth has also been slightly higher in those places.

According to Rasker, outdoor recreation on public lands contributes to the economic growth of western

communities in two distinct ways. The first relates to tourism and the visitor recreation impact.

“People come, they spend money, they buy gear, they stay at hotels,” says Rasker. That’s the tourism component.

To be sure, western states with the most public land visits report the greatest consumer spending on outdoor recreation.

Another way outdoor recreation helps grow western economies is through amenity migration—that is, by attracting people to move to beautiful places with recreational opportunities that improve their quality of life. For instance, some research shows that the aging baby boomer generation is choosing to move to places with access to outdoor recreation, bringing a large demographic shift to western communities. Baby boomers—those born in the post-war period between 1946 and 1964—account for 80 percent of US personal wealth, and as they retire, they bring their substantial resources with them.

While baby boomers may not be spending all of their retirement, social security, and investment income on the latest outdoor gear, they do build homes and require healthcare, which stimulates other sectors of the economy.

Like baby boomers, businesses and entrepreneurs are also attracted to places where their workforce can enjoy an increased quality of life and recreate on public lands. Whereas historically employers would typically set up shop in places where they could find work or an educated labor force, namely urban centers, today’s digital economy allows people and businesses to work from just about anywhere they have an internet connection. And that means many are choosing to live and work in places where they have access to the outdoors.

“And it’s not just for the CEO of a company,” explains Rasker, “but also as a way to recruit talent. They say, ‘Come work for us. Don’t go to Boston or San Francisco—come work for us

and you can go fly fishing after work.”

Such is the case with Weatherby, Inc., a firearms manufacturer, which announced in January it would move its manufacturing headquarters from Paso Robles, California, to Sheridan, Wyoming. When explaining his company’s decision to relocate, Weatherby’s President and CEO, Adam Weatherby, cited Wyoming’s gun-friendly culture and “endless access” to the great outdoors as prime motivators for making the move.

“We wanted a place where we could retain a great workforce, and where our employees could live an outdoor lifestyle,” Weatherby told the Wyoming Business Council.

It’s that point that has entrepreneurs like John Pope excited about the Pilot Hill Project. Pope is the CEO of Blue Sky Group, a Laramie-based company that owns and operates a mix of technology and sustainability businesses that employ about 100 people in the community. He originally moved to Laramie in 1991 for graduate school. Following years of living other places, Pope returned to Laramie

“The Pilot Hill purchase represents a sea change for the quality of life in the town of Laramie. And that wow factor is important when it comes to recruiting people to live here, and for companies to come here.”

*John Pope
CEO, Blue Sky Group*

in 1998 to start the company that would ultimately become Blue Sky because of its location and easy access to trails for outdoor recreation.

“When I moved here in '91, we used to use the Cactus Trail regularly,” recalls Pope, describing a now off-limits section of trail that lies just north of the Pilot Hill property. Although Cactus is not part of Pilot Hill purchase, it gives those familiar with the trail a taste for what’s possible if the project were to go through.

“I still remember the wow factor that everyone had, being able to start in downtown Laramie and directly connect to the beauty and open space of the Laramie Range,” he says. “The Pilot Hill purchase represents a sea change for the quality of life in the town of Laramie. And that wow factor is important when it comes to recruiting people to live here, and for companies to come here.”

Pope believes in the ability of the Pilot Hill land purchase to transform Laramie so much, in fact, that his company donated a couple months’ salary to hire an organizer for the Pilot Hill Project to mobilize partners and community members to make the purchase happen.

“We think the people that are trying to put this together are serious,” he says. “That’s partly why we’re supporting it. They needed someone to do the work to get things moving, to get the funding together to make this happen. So we tried to solve that.”

That someone was Melanie Arnett, a local database manager and avid mountain biker. Since she assumed the position in January, the number of volunteers working on the project has grown from around 40 to well over 100, and over 600 individuals and groups have signed a pledge to donate money to the purchase effort. In addition, several local business organizations, charitable foundations, federal and state agencies, and others, have joined the effort, donating time and resources with hopes of making the

purchase a reality and remaking Laramie into a thriving outdoor recreation destination that can attract more people and businesses to the community.

If they’re successful, there are several examples of cities and towns throughout the West that give organizers hope that, by seizing the opportunity to better connect the City of Laramie to nearby public lands, the community can cash in and grow the local economy.

Take Fruita, Colorado. Twenty-five years ago, the sleepy farm town of 4,000 tucked along the banks of the Colorado River on Colorado’s Western Slope was heavily dependent on oil and gas extraction for revenue and was known more for its dinosaur fossils and apple orchards than its trails. Then in 1995, a group of locals opened a bike shop, worked with the BLM to build a world-class trail system on public land north of town, and started a bike festival. Fast forward to today, and Fruita is a bustling town of 13,000 and a mecca for recreationists of all types,

including bikers, hikers, paddlers, and wildlife watchers. Visitors who make the pilgrimage to town can choose from several hotels and restaurants, but that’s just the start. A recent socio-economic study of the trail networks in Grand Valley, Colorado, of which Fruita is a part, found that the economic impact of trail users on the area’s annual Gross Regional Product—that is, the market value for all final goods and services produced in a region—is well over \$14.5 million and the total labor income that results from visiting trail-user spending regularly exceeds \$9 million. That translates into an estimated \$2.25 million in state and local taxes each year to help pay for the city’s roads, schools, and emergency services.

The same goes for Boise, Idaho. Beginning in the late 1980s, a group known as the Boise Front Coalition began work to connect neighborhoods to nearby public lands via a community trail network. The Ridge to Rivers trail system now hosts nearly 200 miles of multiple-use trails that generate almost \$5 million in tax

revenue each year to the City of Boise, and an additional \$2.5 million to Ada County, according to the Ridges to Rivers Partnership. Today Boise is the fastest-growing city in the US, thanks in part to its access to outdoor recreation.

And it doesn’t stop there. Three Forks, Montana; Duluth, Minnesota; Eagle, Colorado; Prineville, Oregon; even Bentonville, Arkansas—all have shown remarkable economic growth following community investment in outdoor recreation and trails access on public land.

Though Laramie is not likely to triple in population size, as is the case for Fruita, or to become the nation’s fastest growing city, like Boise, there are plenty of reasons to believe that expanded recreational opportunities and public lands access have the potential to transform Laramie into a popular outdoor destination where people and businesses want to visit, live, work, and play.

For one, the town’s location along I-80 means that potential recreational



The farmer's market in downtown Laramie is a draw for residents and visitors.



The Pilot Hill Project Area purchase would protect open space adjacent to Laramie.

tourists are always passing through. Coupled with Wyoming's business-friendly tax environment (the state has no income or corporate tax) and a new 100-gigabit statewide broadband network, Laramie is also well-situated to attract new businesses to town, and convince existing ones, to relocate.

And with efforts underway for a major enhancement of the existing trail infrastructure in the Pole Mountain unit of the Medicine Bow National Forest that would directly connect to Laramie via the Pilot Hill trails, the potential for Laramie becoming a much sought-after mountain-biking destination seems greater than ever.

Unlike Moab, Fruita, and many other western mountain-bike destinations that are too hot to ride in the summer months, Laramie is a high-elevation town that rarely exceeds 80 degrees and is free of rattle snakes, poison oak, and other hazards found elsewhere. Moreover, Laramie's proximity to population centers like Denver and other cities and towns along the Front Range means that it can expect to attract visitors from neighbors to the south in search of fewer people and miles upon miles of flowy single track.

"We could have all of the Front Range coming up here to mountain

bike," Arnett told attendees at the March meeting. While that concerned some community members who don't want to compete with crowds at their favorite trailheads, it also represents an outstanding economic opportunity if Laramie can manage the growth and squeeze a few more dollars out of all those visitors.



Whether the community can come up with the \$10.5 million needed to purchase the land remains to be seen, but recent developments make the acquisition more likely. Organizers of the Pilot Hill Project say they've raised nearly three-quarters of a million dollars so far in community pledges and donations alone. And in June, the Wyoming State Board of Land Commissioners gave approval to proceed with the detailed analysis of a land exchange in which private landowners in Albany and Laramie Counties could acquire stranded parcels of state-owned land within their landholdings at appraised value. The money the landowners pay for those isolated State parcels would then be pooled and used to purchase the Pilot Hill property for State ownership. But even if the entire \$10.5 million value of Pilot Hill is net through such an exchange, the

community would still need to come up with the \$4.5 million to pay for infrastructure costs and a management endowment. To do that, project organizers say they are pursuing other funding options like grants and easements.

And yet, even if the purchase goes through, whether Laramie could actually realize a sizeable economic benefit depends, in large part, on the city's tax structure. Though any increase in the number of visitors or residents in Laramie is sure to have a positive financial impact on the community, the magnitude of that impact is less certain.

"Municipalities in Wyoming are the most fiscally dependent on their state government of any city or town nationwide," explains Laramie Mayor Andi Summerville. "We have the least fiscal independence, or fiscal authority, of anybody else in the country. Which means that we have no ability to raise our own revenue as a city government."

Unlike communities across neighboring states like Colorado and Idaho, which allow municipalities to determine their own tax rates and to decide what goods and services to tax, Wyoming municipalities have only a couple of local tax options to choose from. That means Laramie could

be flooded by mountain bikers and still not see enough revenue to cover things like street repair and basic city services.

If Laramie and other communities around Wyoming want to maximize the economic gains from outdoor recreation through projects like Pilot Hill, they'll need the ability to generate more local tax revenue. But any change to the existing tax code requires legislative approval.

"We think [the legislature] should give municipalities more flexibility," Summerville says. In the case of Laramie, that could mean taxing food, alcohol, and professional services—even groceries.

"If the city voters want another sales tax to capitalize on what's actually going on here, that should be an option," suggests Summerville. "So rather than limiting municipalities' ability to generate new sources of revenue, the legislature should be working to develop solutions that enable communities like Laramie to really capitalize on projects like Pilot Hill. It could do amazing things for the community."

Kit Freedman is an associate research scientist for the Ruckelshaus Institute of Environment and Natural Resources at the University of Wyoming.



Consuming Experiences INSTEAD OF STUFF

What quiet recreationists bring to the outdoor economy and how to reach them

By Emily Reed

With BLM maps in hand and fragments of descriptions from locals, Eric Krszjaniek searches for an old Indian village in Wyoming's Shirley Basin. As he walks across the landscape, he pauses often to reference his *Rockhounding in Wyoming* guide and note the types of rocks in the area. Krszjaniek brings along his camera to capture the expansive landscapes that BLM lands encompass: remnants of history, blocks of petrified wood, and contorted trees standing guard over grassy plains. Whereas others turn to national forests and national parks to recreate, Krszjaniek likes to explore BLM lands through hiking, camping, and backpacking—all forms of "quiet recreation."

It's the subject of his doctoral research in the University of Wyoming's Management and Marketing Department where, before graduating in 2018, he studied how these and other forms of quiet recreation on public land affect consumers. Krszjaniek's research explores a growing trend in quiet outdoor recreation—anti-materialism, the pursuit of experiences instead of stuff. Krszjaniek set out to understand the link between the two, with big implications for how outdoor recreation is managed and promoted in Wyoming and other states.

To dig into the motivations behind this anti-consumption, Krszjaniek interviewed individuals who self-identified as quiet recreationists as well as individuals who help manage the lands that quiet recreationists use. In the vernacular of the Marketing and Management Department, the study participants were "consumers" who seek out not material goods, but experiences. They trend toward solitude and minimal community and are a hard-to-reach group for purposes of marketing. His results provide insights into consumer behavior and patterns that traditional research in marketing tends to overlook.

He found that the very nature of some quiet recreation activities such as backpacking, led participants to intimately examine which material items were necessary and which were not. By paring down to the essentials, participants were then free to focus on the experience rather than making decisions. "It's easier—you don't have to worry about things. You've got one choice of shirt," said one interviewee. The positive emotion that stems from the experience prompts consumers to reduce their material possessions even further. Participants reported that they also became mindful of the lifecycle of products, caring for their material possessions and decreasing the need to buy new things.

As consumers downsize their material possessions, says Krszjaniek, "anti-materiality behavior eventually becomes a goal in and of itself separate from the experiential consumption experience." Some recreationists take anti-materialism one step further by competing against one another for who can live most simply. Krszjaniek writes in his dissertation that the consumer "is driven to consume even less as a form of competition, and not doing so becomes a point of stress and consternation." Some participants expressed a sense of guilt for having too many things. One individual labeled herself as an over-consumer

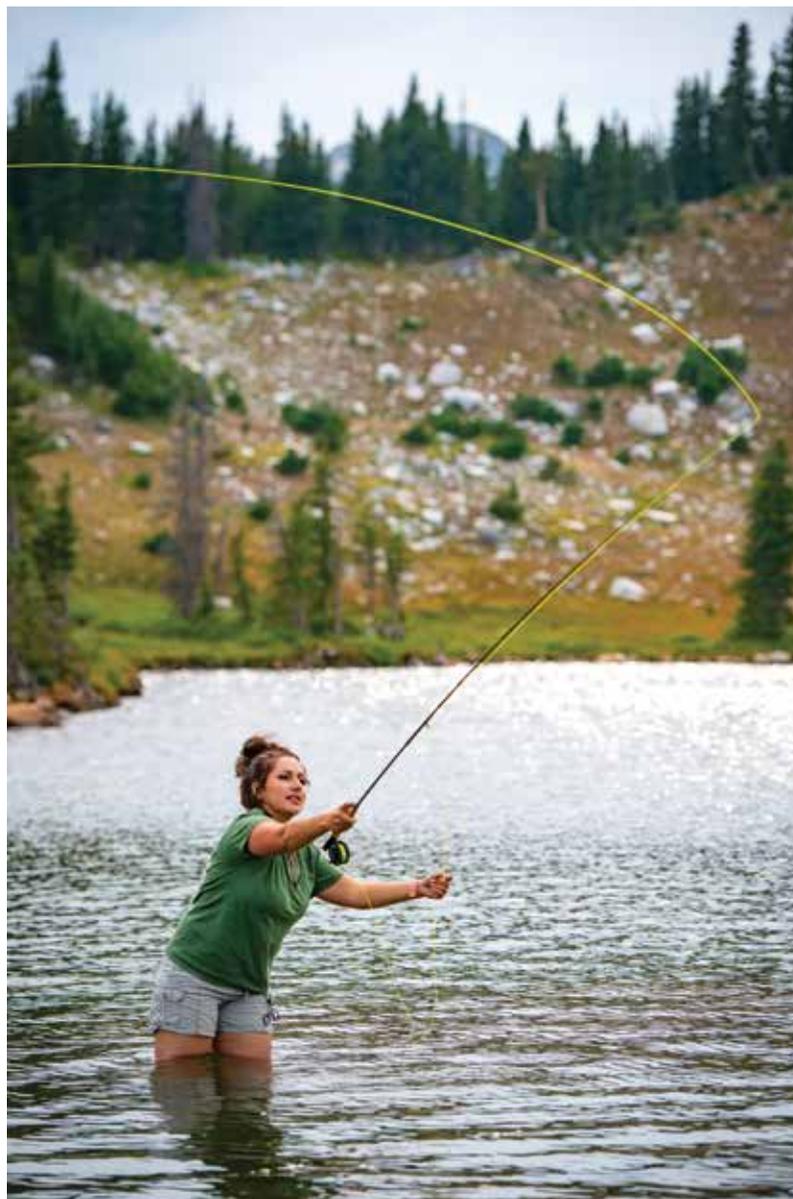
The diversity of Wyoming’s public lands, together with the diversity of its visitors, offers a range of experiences—something that the business community and others in Wyoming could market.

because she lives alone in a two-bedroom apartment full of stuff.

While current marketing theory holds that anti-consumption is a trend in consumer behavior, Krszjaniek found that “anti-consumption is actually a move by consumers toward a different form of consumption.” Quiet recreationists tend to collect experiences, which they often share with others either directly or indirectly through social media such as the photo-sharing platform Instagram. For some, the experience and sharing behavior that follows are similar to a religious experience. “The consumer becomes evangelical to the non-practicing and not-yet-awakened experiential consumer,” Krszjaniek says. The consumers, driven by their experiences, become proselytizers of their consumption. As one participant stated, “I want to express to other people how valuable and good they [the experiences] are.”

Beyond sharing and seeking out versions of these experiences, Krszjaniek found that quiet recreation experiences can “transform a consumer’s identity and lead to internalized behavioral changes.” After an initial experience, participants said they started to devote greater amounts of time to be outside. Krszjaniek explains this as part of an identity change among quiet recreation participants: “If you really enjoy something, you get some positive effect from it and you want to have more of that, [and] it becomes higher on your list of priorities ... you become this person that seeks out these things and through that, it becomes something you’re known for and it makes you who you are.”

The increasing desire to recreate causes individuals to source out specific places to fuel their experiences. But not all public lands



are equal in their ability to support these quiet-recreation experiences. Some study participants expressed resentment toward national parks because of the sheer numbers of people and the extensive infrastructure that makes the experience feel too curated. Instead, study participants reported a preference for recreation on BLM lands to fulfill a need for fewer rules, unstructured land, quiet, and the opportunity for introspection.

While these types of experiences require little-to-no materials, consumers still need specific goods to facilitate them such as cars, fuel, food, and lodging—helping boost the economy. A 2014 study commissioned by Pew Charitable Trusts found that BLM lands in Wyoming generated \$112 million dollars in overall spending and 1,074 jobs from quiet recreation. The economic contribution from quiet recreation on public lands is particularly

important to Wyoming, where tourism is the second-leading industry.

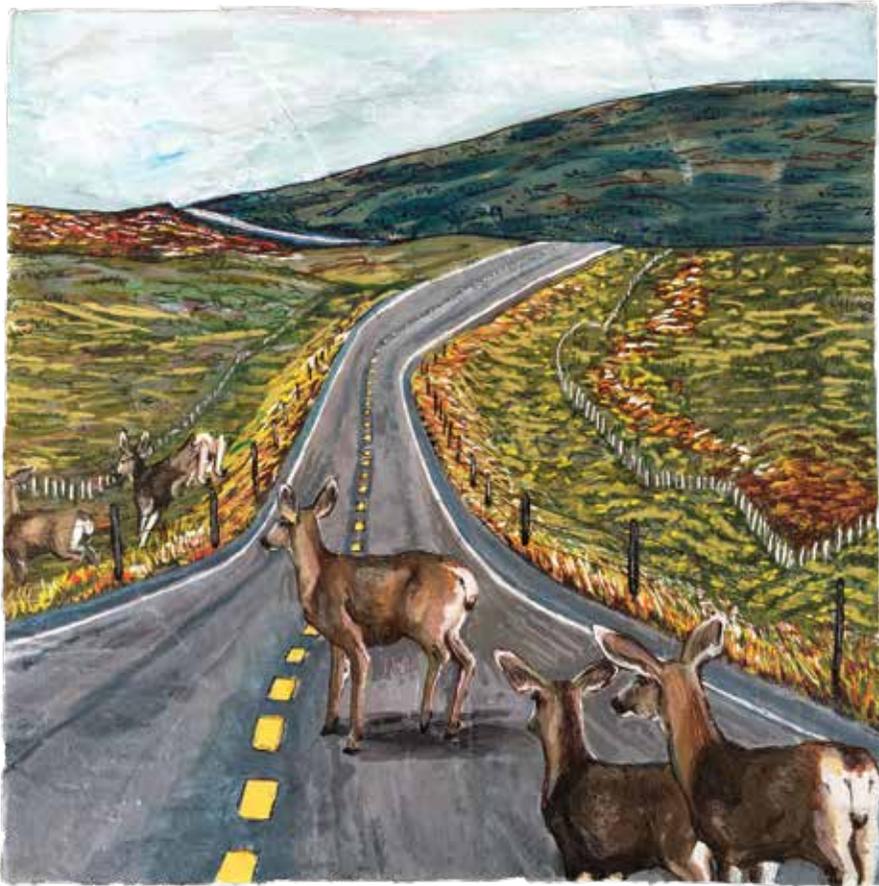
The diversity of Wyoming’s public lands, together with the diversity of its visitors, offers a range of experiences—something that the business community and others in Wyoming could market. But relative to surrounding states, such as Utah and Colorado, Wyoming lacks in its efforts to promote quiet recreation opportunities on BLM lands. “There is huge potential to develop ecotourism around these BLM areas,” Krszjaniek says. Service providers such as hunting outfitters, climbing guides, and mountain biking guides could promote and support quiet recreation, allowing out-of-state visitors to experience the state in ways that are different from more popular places such as national parks. With specialized knowledge and experience, outfitters and guides could attract more visitors to BLM lands, which tend to be spaces with limited roads, signage, and amenities. Such services would help visitors create positive experiences on BLM lands, drawing them back to these places again and again.

While some Wyoming residents fear that promoting quiet recreation will lead to more people and diminished recreation experiences, research like Krszjaniek’s shows a big upside—the creation of more sustainable consumers that still help fuel Wyoming’s economy. “If we can adapt and see these trends and then provide a sustainable lifestyle and community,” reflects Krszjaniek, “we will indeed benefit economically from promotion of quiet recreation.”

Emily Reed is a University of Wyoming undergraduate student majoring in English and Environment & Natural Resources. Her writing is inspired by connections between people and nature.



A Different Kind of MAP



Social science reveals the contours of wildlife migration's human dimensions

Text by Joshua Morse

Artwork by Mary Katherine Scott

On an early June morning, I found Jessi Johnson and her hunting partner loading up a bright red pickup, deep in discussion about the best spot to scout for bedded-down deer. They settled on Red Canyon, where Jessi had her first solo hunt a few seasons ago. I clambered into the back seat of the truck, notebook and binoculars in hand. This scouting trip would be my first glimpse into a world I had been studying from afar for months.

As we rumbled through the canyon, Jessi began to spot well-hidden mule deer. Hours later, I was starting to get the hang of it, picking out a doe nestled underneath an awning of juniper. She held my attention for 10 minutes at least, but as Jessi's hunting partner put the truck in gear to leave, I noticed Jessi still craning her neck, keeping the animal in view as long as possible. With a small smile she settled back into her seat and remarked, "I could have watched that deer all morning."

Jessi was one of the first of over fifty people whose deep investment in mule deer became the focus of my summer. I was a graduate student researching a long-distance mule deer migration from the lowlands of the Red Desert to the mountainous Hoback Basin, 50 miles west of Red Canyon. However, the focus of my work was not the deer themselves but the human stakeholders whose values, goals, and conflicts will decide how wildlife migrations are managed. As a social scientist, I had come to Wyoming to map the human dimensions of the Red Desert to Hoback migration: who cares about the migration and why, what problems they see facing it, and what they think we should do about these challenges. In wildlife management, conflict between human stakeholders is increasingly recognized as a major barrier to good policy. My research aimed to help stakeholders better understand the social and political barriers to sustaining the migration for future generations.



I began my quest to map the cultural landscape underlying the Red Desert to Hoback migration as a master's student at the Yale School of Forestry in Connecticut. I had never seen a mule deer and was planning to conduct my thesis on land conservation in New England. But one October morning, my

advisor mentioned the Red Desert to Hoback migration in passing during a lecture on human-wildlife coexistence. That same afternoon, I was making plans to travel to Wyoming.

In the following months of preparation, I discovered that the Greater Yellowstone Ecosystem's wildlife migrations are masterpieces of ecological choreography. Every spring, thousands of mule deer—a ghostly grey species that is both more rugged and more graceful than the eastern white tail—leave the low-elevation sagebrush deserts where they have weathered the harsh Wyoming winter in pursuit of fresh graze in the mountains. Any old-timer will tell you that deer migrate seasonally from the deserts to the uplands. What makes the Red Desert to Hoback migration special is its length—150 miles from start to finish—and the fact that it persists despite the increasing fragmentation of Wyoming's landscape. Highways, subdivisions, and energy development have all restricted the movements of big game species like mule deer, elk, and pronghorn. Scientists and historians

believe that wildlife migrations on the scale of Red Desert to Hoback might once have been common, but today, they are practically unheard of.

University of Wyoming biologist Matt Kauffman sees the Red Desert to Hoback migration as a crucial opportunity. "There is probably a tipping point in the amount of development that can occur along the length of the migration [before the route is lost]," he observed early in our conversation. Kauffman was quick to add that science is a long way off from pinpointing that tipping point. But, the cost of losing migrations—the ecological pulse of the west and a cornerstone of the region's cultural heritage—is at the forefront of his thoughts. The implication that we have already reached that tipping point and lost many, many wildlife migrations hung heavily over our meeting.

In 2011, biologists using advanced GPS collars first documented mule deer traversing the 150 miles between the Red Desert lowlands and Hoback Basin. A ground-breaking analysis of biological and physical threats to the newly

documented corridor was quick to follow these initial studies. Acting on this work, conservation organizations placed key private parcels along the migration corridor under conservation easement, ranchers modified miles of fences to ease wildlife crossings, and Wyoming Game and Fish drafted new regulations to protect corridor habitat. However, these successes fall short of a comprehensive approach to managing the Red Desert to Hoback migration—or any other migration—for the long-term.

Just about everyone wants to see the Red Desert to Hoback and other migrations continue. But, stakeholders have very different ideas of what obstacles must be surmounted to get there. My research aimed to bring these diverse perspectives into focus. Out of 50 conversations and then some, 45 yielded comprehensive interviews that I was able to analyze in detail, painting a picture of how the migration's stakeholders understand "the problem" facing it. As it turns out, there is not just one concept of the problem where this migration is concerned, but four.



Early in the summer, I drove to Jackson to speak with someone who could get me acquainted with the physical challenges facing the Red Desert to Hoback migration. Chris Colligan works for the Greater Yellowstone Coalition, an environmental nonprofit in Jackson, where he advocates for issues ranging from wildlife migrations to endangered species status for the grizzly. When we met to discuss the Red Desert to Hoback migration, Chris defined the problem as making sure that the corridor remains physically passable for migrating deer. He highlighted the progress in this arena: "[The NGOs] are working with the conservation district to do a lot of fence modification," he noted, "[but] the piece I've been most interested in has been the highway-crossing element." Chris went on to explain that additional highway

wildlife crossings along the Red Desert to Hoback corridor would not only ensure the persistence of that migration, but could also benefit other wildlife species that move along roughly the same route.

Before visiting the Red Desert to Hoback corridor, I doubted the relevance of engineering fixes like overpasses and fence modification in the grand scheme of safeguarding a long-distance migration for posterity. Chalk it up to the academic hubris of an untested social scientist. A short drive down Scab Creek Road south and east of Pinedale expanded my perspective. Scanning the desert for the telltale ears of resting mule deer, a flash of white against the grey-green of the high plains seized my attention. I stepped out of my car to regard the bleached bones of a deer leg hanging limp between two strands of barbed wire. The rest of the unfortunate animal's skeleton lay splayed out beneath the fence, picked clean by ravens and magpies. Faced with such a grizzly scene, the physical hurdles that migrating deer must traverse—and that human stakeholders must find ways to mediate—are impossible to ignore.

A focus on the physical barriers to migrations was a common thread throughout my summer. In addition to Chris, 15 more of my 45 interviewees shared this orientation. They listed a dizzying array of obstacles along the corridor—and potential solutions. Ranchers reported that migrating wildlife routinely got stuck in their fences and saw help from NGOs installing wildlife-friendly fencing as an opportunity to collaborate. Department of Transportation officials proudly cited the speed at which they had responded to requests from the scientific community to install wildlife-friendly fencing along the migration corridor. Energy industry representatives pointed to the role that funding from their companies played in making technical fixes to obstacles along the migration corridor. However, the physical barriers to





migration were not the only challenges that stakeholders identified during my interviews.

A few weeks after my conversation with Chris, I caught up with a biologist from an oil and gas firm operating along the corridor to discuss a different angle on the migration. The biologist preferred that I not report his real name, so, we'll call him Nate. Over the course of our conversation, I began to get a sense of the complex social landscape that stakeholders invested in the migration must navigate. In my experience, finding anyone working in energy willing to talk with a graduate student studying migrations had proved challenging. But to my surprise, one

of the first things that Nate wanted to discuss with me was this very reticence. As it turned out, Nate and I had both attended the same public forum on the Red Desert to Hoback migration during the previous November. And, we had both been struck by the near absence of energy industry representatives at the event. Industry representatives had been invited to the forum, Nate clarified, but many chose not to attend because, "we generally don't show up to events where we anticipate heckling." However, Nate wasted no time in stressing that he believes that this elusiveness is a mistake. "In a state like Wyoming," he observed, "relationships are very, very important."

And yet, my interviews underscored just how difficult maintaining working relationships around a topic like migration can be. Across my interviews, feelings of mistrust and disrespect were evident. Ten more interviewees in addition to Nate, running the gamut from NGO and agency staff to die-hard back-country hunters, highlighted the challenges that encouraging collaboration between disparate factions posed to the migration. With this tension clearly in mind, Nate summed up his perspective on the key obstacle facing the Red Desert to Hoback migration as "the fact that you don't have a lot of people in the middle." This struck me as a

grim perspective on the long history of conflict between development interests and conservationists in the West, and a contentious one in its own right given the mule deer's popularity. As Nate sees it, fence modification, overpass installation, and even implementing new conservation policies will remain slow going until social tensions can be resolved among stakeholders with different ideas about how to manage migrations.

Perspectives on the physical and social challenges facing the Red Desert to Hoback migration seem to have little in common at first glance. But there is one key similarity: both conceptions of "the problem" facing migrations assume that the overarching policy process that will decide the migration's fate is fundamentally sound. As my summer neared its end, one final conversation revealed how this very assumption of fair governance is among the challenges facing the migration.

"Wyoming has a problem," proclaimed Sarah (who preferred that we not share her last name), "with people outside of Wyoming trying to dictate what we should do." Sarah and her husband both come from ranching families and run an outfitting business just north of Pinedale. They have been making their living guiding elk and mule deer hunters into the Bridger-Teton National Forest for decades. Big game is a livelihood for Sarah, giving her a clear stake in how species like mule deer are managed.

The interests of outsiders are another matter. For Sarah, the problem is not about fences, about bringing people to the table, or about helping polarized voices reach common ground. Rather, it is about making sure that the players involved in deciding the migration's fate have an honest stake in the matter. As Sarah bluntly put it: "If you don't live here, why should you be the one who has a say in what goes on here?" Having a right to comment on an issue like the Red Desert to Hoback migration, in Sarah's opinion, is contingent on



understanding how the issue impacts the people for whom it is a part of every-day life. Sarah worries that in Wyoming outside interests are shaping wildlife policies that have local consequences, with the potential to disenfranchise the people most directly invested in the state's wildlife. Similar perspectives, focused on a perception of lopsided distributions of power in the governance of Wyoming's wildlife, cropped up among an additional 10 interviewees as diverse as state officials and local newspaper reporters.

Physical, social, and governance problems comprised the majority of my interviewees' perspectives, but not all. What challenges did the last seven see facing the migration? Much to my surprise, none. As one state employee put it, "We have a great resource here, so it's kind of hard to mess up a good thing." These stakeholders saw no disparity between current conditions and desired conditions for the migration. Although this non-issue perspective was the least common in my interviews, it does contribute to the complex social and political landscape surrounding the Red Desert to Hoback migration.

Without question, Wyoming is burdened with an abundance of

polarizing issues. But, the state's landscape and wildlife are powerful reminders of the importance of making a go of it, despite the different priorities and values of its human inhabitants.

Each night, as I set out my camp on public land backlit by sun sinking behind the Wyoming Range, I found a kind of balance. Wrestling with tent stakes or my bear bag, I would work over my day's interviews, often perplexed by the dizzying array of perspectives I was uncovering, and always tired. But by the time I spread my sleeping bag and bedded down in the sagebrush—not unlike a mule deer—my confusion would have given way. I found it impossible to dwell on the differences that sometimes seemed to define this migration and its human stakeholders, when faced with the landscape that we all found ourselves working on, in, and for.



A thousand miles and change on the rented Nissan Leaf. Fifty conversations and then some, and night after night camped out along the migration corridor. From the vantage point of these experiences, I no longer see the Red Desert to Hoback migration as a single management challenge, but as a series of related problems that twist and turn together

like a braided rope. It is the lifeline that keeps a great mule deer herd intact in an unforgiving landscape. It is a perilously narrow stretch of undeveloped land crisscrossing highways and fences along the foothills of the Wind River Range. It is a spider web of stakeholders, at times with precious little in common holding them together. And it is a vivid reminder of the fact that not all who feel they should have a place at the decision-making table believe their voices are being heard.

If my observations from a summer along the migration corridor have any potential to help, I think it stems from this insight: while the challenges facing the migration are diverse, they need not be divisive. As it stands, stakeholders across southern Wyoming share a fundamental value where the Red Desert to Hoback migration is concerned—they want to see the migration survive and thrive for future generations. The diverse problem definitions they adhere to exist because of their diverse experiences of this common concern.

Two weeks before my return to New Haven, I found myself working over these intertwined conundrums while coming to terms with the fact that I was lost in the Hoback.

The aspen-dotted slope of some nameless mountain rose gently against a bluebird sky, and acres of hay glowed in the late afternoon light. A movement at the edge of the hayfield caught my attention. Timidly, a mule deer doe stepped onto the two-track ahead of me. Her oversized ears swiveled in my direction, and her body tensed. As she turned her head to fix me with her wide, wild eyes, I spotted a thick black GPS collar on her neck. I reached for my camera as the doe sprang away. But, she left a lingering impression. Even when the way forward is unclear, the deer at the heart of the Red Desert to Hoback migration are a tangible reminder of our common cause.

Joshua Morse earned a master's degree in environmental science from Yale School of Forestry for his work on the Red Desert to Hoback migration. He is now pursuing a PhD at the University of Vermont's Rubenstein School of Natural Resources, where he studies the ways that hard-to-quantify benefits from ecosystems are represented in policy.

Mary Katherine Scott teaches for the Honors College at the University of Wyoming and creates multimedia artwork about people and place. See more of her work at marykatherinescott.com.

What to Do with Wilderness Study Areas?

*A collaborative stakeholder group
negotiates a solution*

By Steve Smutko

On a sunny afternoon in early May, twelve people sat around plastic tables in a classroom in the Carbon County Higher Education Center in Rawlins, Wyoming. All were members of the Carbon County Wyoming Public Lands Initiative Advisory Committee. Since this was their 18th meeting, they were comfortable working together. They spoke honestly and openly about their beliefs and attitudes regarding management of public lands. Sitting behind the committee were a few ranchers who depend on grazing allotments in the Ferris Mountains Wilderness Study Area, one of four wilderness study areas, or WSAs, under consideration, and a subject the committee would discuss later that afternoon.

Committee member Jeff Streeter, the North Platte Project Manager for Trout Unlimited, presented the finer points of a proposal to designate the Encampment River Canyon WSA as a new wilderness area within the National Wilderness Preservation System. John Johnson, a Carbon County Commissioner and a member of the Carbon County committee asked for more details about Streeter's suggestion to adjust the boundary of the proposed wilderness area. Streeter pointed to a map projected on the classroom whiteboard. "I'd like to move the current WSA boundary just to the other side of the creek so that the Odd Fellows Lodge members can get to their headgate with motorized equipment," he said.

Streeter's proposal for designating the Encampment River Canyon as wilderness wasn't the only option under discussion by the Carbon County committee.

Leanne Correll, an agricultural consultant specializing in conservation issues who represents the general public on the committee, proposed that the WSA should be designated as a national conservation area instead, which would allow limited motorized access for grazing permittees, a use not permitted in designated wilderness areas. While Streeter's wilderness proposal had backing from committee members representing state and national conservation organizations, those with agricultural roots in the county preferred Correll's option.

The committee had agreed to seek a consensus solution on future designation and management recommendations for the four WSAs in Carbon County, and ironing out the differences in these two proposals was not going to be easy. Although the trade-offs between establishing the Encampment River Canyon as a wilderness area or a national conservation area may seem minor—a few ATV trips each year to repair fences and inspect irrigation structures—the implications of wilderness designation are huge in Wyoming. For some, designating new wilderness areas is the only sure way to protect remaining pristine wild places. For others, wilderness is exclusionary, limiting working lands and motorized or mechanized access. The diverse interest groups represented on the committee needed to engage in a deliberate negotiation process, one in which each participant stood to gain something. My role, as a facilitator hired by the committee, was to guide them through that process and help them successfully arrive at consensus recommendations. They had to let go of entrenched positions about wilderness and explore agreements that would benefit both the



landscapes and people of Carbon County.



A Wilderness Study Area is a federally managed roadless natural area that provides outstanding opportunities for solitude and primitive recreation and has the potential to become a wilderness area. WSAs are managed to protect their wilderness character and potential until Congress either designates them as wilderness or releases them from WSA status for other uses. In Wyoming, many areas have remained in limbo under a temporary WSA status for more than 30 years.

The Wyoming County Commissioners Association created the Wyoming Public Lands Initiative as a locally led process to recommend permanent designations for Wyoming's Wilderness Study Areas. Any county with a WSA could opt into the initiative and appoint an advisory committee to negotiate the desired future uses and management of the county's WSAs. If approved by their respective Board

of County Commissioners, the recommendations of each county committee will be bundled together later this year and advanced to Wyoming's Congressional delegation for introduction as a federal lands bill in Congress.

Wyoming is home to 45 WSAs comprising just under 706,300 acres. The Bureau of Land Management (BLM) manages 42 of them, and the US Forest Service manages the other three. The Carbon County Wyoming Public Lands Initiative Advisory Committee is one among eight such advisory committees that have formed statewide to negotiate the future management and designation of 24 of those WSAs or about 352,330 acres in Carbon, Fremont (in part with Natrona), Johnson, Park, Sublette, Teton, and Washakie (in part with Hot Springs) counties. In addition, a combined Johnson-Campbell County committee was formed to develop recommendations for the Fortification Creek WSA.

The task that these eight advisory committees agreed to take on is not trivial. Each committee must represent

diverse interests related to public lands designation and, "to the maximum extent possible," reach decisions by consensus. Committee members are to review and evaluate the natural, cultural, social, and economic aspects of each WSA; gather public input; and develop management recommendations appropriate for the lands under consideration and the people who use them. To accomplish this, committees may also consider other areas within each county for potential inclusion in their recommendations, including potential wilderness areas, land-use designations, transfers, or other management actions not within the boundaries of existing WSAs. Wanting to take action on the four WSAs in Carbon County, the County Board of Commissioners voted to assemble an advisory committee to tackle the issue.



Carbon County formed its committee in the fall of 2016. The 11 committee members came from

backgrounds including education, ranching, conservation, small business, and county government. Each member represented a specific constituency such as motorized and non-motorized recreation, hunting and fishing, agriculture and ranching, energy development, or conservation. Two committee members represented the general public. All came together with the intention of working collaboratively to find a set of management designations that make sense for the people and landscapes of Carbon County.

Soon after the committee was formed, Carbon County Commissioner, rancher, and committee co-chair John Espy requested facilitation assistance from the University of Wyoming's Ruckelshaus Institute. As a teacher, researcher, and practitioner in collaborative decision making, I agreed to facilitate the committee. My primary responsibility was to guide it through a multi-party collaboration process where members could gather and share information, clearly communicate their interests, generate and evaluate management options, negotiate tradeoffs, and reach agreement.

I soon discovered that the Wyoming Public Lands Initiative came with some built-in challenges that would make collaborative decision making difficult. One challenge was that not everyone agreed that wilderness study area designations should change at all.

"Current management of the WSAs is a problem for some and not for others" said Joe Parsons, director of the Carbon County Conservation District and a committee member. "To find a solution to a problem that we don't all agree to is really difficult."

Since most WSAs are currently managed to protect their wilderness character, the status quo was more acceptable to wilderness advocates than to ATV users, for example. "I would much rather see the WSAs

retained in their current status than released to general management,” said Connie Wilbert, Executive Director of the Sierra Club’s Wyoming Chapter and a Carbon County committee member. “Designations other than wilderness are difficult to justify as a conservation gain for most of Wyoming’s WSAs.”

Changing the status of a Wilderness Study Area takes an act of Congress, and if the committee failed to reach agreement on a WSA designation, that area would likely remain a WSA for years to come—a better outcome for a conservationist than for, perhaps, a rancher. This difference in perceptions of the status quo made it so some parties could take an all-or-nothing position and created a group dynamic that made collaboration difficult.

A second challenge of adapting the Wyoming Public Lands Initiative process to multi-party collaboration was finding middle ground between the two polar positions of either designating a WSA as wilderness or releasing it to general management. Whether a landscape will be called wilderness or something else is as important as how it will be managed. For this collaboration to work, some WSAs had to become wilderness areas, and some had to be released—or close to it. That would be easier if the WSAs were large enough to accommodate wilderness and some other form of management, or if there were a sufficient number of WSAs under discussion that some could be designated as wilderness and others managed for different purposes. In Carbon County, with only four relatively small WSAs neither condition exits. Reaching agreement was not going to be easy.



Most of the committee’s first year was spent collecting information about the four Carbon County WSAs, touring them on foot and by small aircraft, and gathering input from people throughout the county. Over

this time, the committee developed a shared understanding of the characteristics and character of the four WSAs. They also refined and shared their own values and beliefs about these areas, building rapport and trust. The Carbon County committee agreed that an acceptable solution would need to meet all parties’ most important interests, so the group spent time talking about the principles and beliefs their interests are based on.

“The slow, careful process where people get to hear about others’ views and the reasons behind them was critical,” said Espy.

“Most people have been able to express their interests pretty well,” said Parsons. “The ability to put our interests on the board and see that we aren’t that far apart was really interesting.”

“We are a very positive group,” added Correll. “We’ve been on field trips together and we talk together on breaks and in between meetings. We have been able to have one-on-one conversations even though we disagree. That’s what has helped us work well together.”

But not all committee members felt that their interests were taken to heart by everyone. “I have done my best to communicate my values-based appreciation of wilderness and its importance,” said Wilbert, “but I don’t think that other members really see my viewpoint. I feel there is far more acknowledgement of the validity of agricultural interests than conservation interests.”

From their review of the WSAs and their “slow, careful process,” the committee generated a range of management options for each WSA such as designation as wilderness, conservation with directed management, or release

to general management by the BLM. With all the options on the table, negotiations began in earnest in June.

Negotiation implies conflict and disagreement. It requires intense interaction among committee members—many of whom are friends and neighbors—that can feel adversarial at times. This made many on the Carbon County committee uneasy. As the group’s facilitator, my role was to steer them toward agreements based on all parties’ interests. I aimed to help each negotiator maximize his or her gains while allowing the other parties to make gains as well.

In June, they settled on 13 different proposals for the four WSAs. Wilderness designation was on the table for each WSA as were other options. To explore areas of agreement, they took straw polls identifying components of each proposal that committee members could support or not. The straw

polling revealed that even though some directed management proposals could result in wilderness-like management, the addition of lands to the National Wilderness Preservation System was necessary for some conservation members. To reach consensus, the committee needed to agree where and how much wilderness would be part of the mix of land management designations.

As the spring winds began to dry the Carbon County landscape to its typical brown summer hue, the committee honed management options into about a dozen succinct proposals. In their July meeting, they negotiated trade-offs between WSAs, adjusted boundaries of special management areas, and debated the addition of wilderness areas. The character of the negotiation changed from that of creative cooperation to an arduous search for agreement.



In the end, the committee reached tentative consensus on designation recommendations for three of the four WSAs. They proposed that Encampment River Canyon be designated wilderness minus 3.88 acres surrounding an irrigation point of diversion on Miner Creek. Prospect Mountain WSA would also garner a wilderness designation, and an additional 1,200 acres of BLM land north of the WSA would achieve special management area designation to limit motorized access and energy development. The committee proposed that the Bennett Mountains WSA become a special management area prohibiting energy development but allowing some motorized access. For the Ferris Mountains, the largest of the four WSAs, the committee agreed to disagree. Its status will not change from WSA as a result of this process. In October the committee submitted its recommendations to the Board of County Commissioners for approval. Once approved, the recommendations will eventually



make their way to Congress though it remains to be seen whether or how quickly Wyoming's Congressional delegation can get such a proposal passed.

The committee was relieved to find that they could actually come to agreement. "I wasn't sure until the last meeting when people began to compromise and look at the best option for the management of that resource instead of drawing lines in the sand," Espy said. "I saw people giving and taking. This couldn't have happened without spending the past year meeting and building faith and trust."

"It was more difficult than I anticipated and took more time than I thought it would, but it just takes time to do this kind of work," said Parsons. "I think this is our best shot for getting a locally driven designation for our public lands. We complain about top-down management of public lands and here is our opportunity to work from the local level up. I think we've been able to do that."

Steve Smutko holds the Spicer Chair for Collaborative Practice at the University of Wyoming Haub School of Environment and Natural Resources and is a public-process facilitator in the Ruckelshaus Institute, publisher of this magazine.



Carbon County Wilderness Study Areas

ENCAMPMENT RIVER CANYON WSA

4,547 acres

Spanning the Encampment River, this WSA provides superb fishing, hunting, backpacking, horseback riding, and hiking opportunities. It is easily accessed from campgrounds and cabins near Encampment, Wyoming. The popular Encampment River trail follows the canyon upriver through the WSA, leading to the nearby Encampment River Wilderness.

PROSPECT MOUNTAIN WSA

1,145 acres

Abutting the Platte River Wilderness on the Medicine Bow National Forest, this WSA is forested with lodgepole pine and aspen, offering crucial winter habitat for the Snowy Range elk herd. Outside of hunting, most recreational use is confined to a primitive public road that forms the WSA's northern boundary and provides boating access to the North Platte River.

BENNETT MOUNTAIN WSA

6,003 acres

A high plateau rises above Seminoe Reservoir with numerous tributary draws and steep rocky ledges and walls. Grass and sagebrush grow between pockets of pine, aspen, and willows. Recreation access is limited since private land surrounds the WSA except for a state-owned section near its northeastern boundary. The mountain offers secluded recreation sites, but they are small, and visitors may overlap as they travel between canyons.

FERRIS MOUNTAINS WSA

22,245 acres

Undulating bands of light-gray limestone along the mountains' steep south face resemble the cartoon trail of a hopping kangaroo. Ferris Peak, the highest point in the Great Divide Basin, rises 3,000 feet from the valley floor. Steep slopes, deep canyons, and meadowlands define the mountain range. The rocky cliffs provide excellent nesting habitat for many raptors, particularly prairie falcons and golden eagles. The area also holds habitat for elk, mule deer, and bighorn sheep.



BELONGING



AN ESSAY

By Ann Stebner Steele

Sunlight and wind circled me, a girl looking out over the Red Desert and the small stream below. Perched next to a gnarled, twisted juniper that had been dead for my entire life, I sat at the edge of the draw that held the green meadow where my family had been camping since before I was born. I could look down into that meadow, onto the stream ribboning through the plump thickets of willows. I could see the old line shack tilting at the top of the meadow, a dilapidated, wooden structure that had once housed shepherders for the summer. Farther downstream, I could see our fire ring, set into the flat earth just before the canyon walls pinched in. I could see our backpacking tents—mine, my brother’s, our parents’. Our mother reclined in a camp chair with a book open on her knee, our father chipped golf balls, and our family Labrador chased them into the long grass.

And, when I looked up and across the draw, I could

see the sweep of the desert going on to Oregon Buttes and the edge of the world. I could see all that sage, the faint threads of two-track roads winding through it, the hint of the Sweetwater River’s canyon, just a shadow interrupting the misleading flatness of that land.

It was easy to think it existed just for us, my family of four. It was easy to breathe in the tang of sage and the faint dampness of the creek far below and to know that it belonged to me.



But did it belong to me, to my family? Yes, and no.

Like so much of the West, most of the Red Desert, including our meadow, is public land. As members of the public, we owned it in a sense, along with other members of the public. But we also laid claim to it, as many Westerners have done with many pieces of land over the years, through the time we spent there—the days and weeks that revealed to us the temperament of the stream,

the patterns of the wind during calmness and storm, the shape of shadows in all seasons.

It did not matter to me that the camp was public land, not when I was very young. My family began hunting antelope and camping in Wyoming's Red Desert when my father's father was a boy. My parents, my uncles, and my aunt discovered our camp in the early 1980s, before my brother and I were born. My brother was eight weeks old the first time my parents took him to the camp, and I was six weeks old for my first trip. This was a land of dust and wind and distant horizons, a land that tourists rushing past on the interstate would likely compare to the moon. From our front door in Rawlins, the trip to the desert swallowed one hundred miles and three hours, most of it on dirt roads. We rarely saw anyone else on our way to the camp, never shared the meadow with other outdoorsmen. It seemed our very own oasis, our family secret.

But the story of ownership of that meadow is complicated. The meadow is, in legal fact, part federal land and part state land. These governments follow different management principles. Federal agencies like the Bureau of Land Management (BLM) manage most of the land under their care according to the doctrine of multiple use. However, the Wyoming State Board of Land Commissioners must utilize state lands to raise funds for state institutions. I always wondered why these lands were commonly referred to as "school sections" and learned as an adult that schools were prominently named in the grants that originally transferred land from the federal government to the state for fundraising purposes. It seems more direct to simply call them "state trust lands" or "state lands," though I am partial to the hidden narrative behind the name "school section."

Until 1988, the state limited access to its lands to those who held grazing leases. When they expanded the statutes to include recreational day use, like hiking, hunting, and fishing, the board addressed the concerns



of grazing lessees by specifically prohibiting overnight camping and campfires. I do not know whether this prohibition limits damage done to state lands by careless users. I do know many families who, like my own, had formed deep connections to state land and camped on parcels that belonged to the state, knowingly or unknowingly, and that the state rarely intervened unless grazing lessees complained.

As a child, I did not understand that the meadow was bifurcated, split between the BLM and the state. It was a line we could not see, for there was no marker. As I grew older, I noticed that my parents, who regularly studied the maps, knew that the line existed. But it was tricky to name exactly where it was. The only landmark on the map was the creek, which redefined its banks every year during spring run-off. We would learn later that the bend that my parents thought marked the divide between state land at the top of the meadow and BLM land at the bottom was not the bend reflected on the map. But because our little corner of the Red Desert was largely unknown, or at least ignored at that time, the exact location of the line seemed unimportant.

Wind and snow circled the old juniper, and I pressed my palm to the tree's roughened skin. An early spring storm blew around me, drifting white

in draws and coulees of the desert. I was a young woman, just graduated from the University of Wyoming, and my boyfriend, Rob, stood with his arm around me. Except, now he was my fiancé—he had moments before knelt in the dust by the tree and asked me to marry him. With my boots against the gritty earth, I looked into his green eyes and felt something settle into place. I felt the cool gold of the unfamiliar ring warming on my left hand and looked out over land that I knew by heart—the desert sweeping away toward the silhouette of the Wind River Mountains, the land falling away into the creek's draw, the meadow spreading green and wet with snow-melt below.

But the meadow looked different. The line shack slouched at the top of the flat, nearly collapsed in on itself rather than standing upright. My family's tents crowded together downstream, just above the steep, narrow pitch of the creek's canyon rather than circled around the fire ring. Though Rob and I would celebrate with our families that night, I would miss the familiar set of the canyon as viewed from the fire, the clean view of the line shack upstream and the tree above. From our new, makeshift camp, we could not see the shack—it was veiled by thick willows, hidden. It was as if my world had been shifted a quarter turn, and nothing was quite where I had always known it to be. As I began to reorient myself, to find my

bearings, I struggled to reconcile the old ways with the new.

That line between BLM and state land had grown heavy since I was a child, and it weighed now on my sense of belonging, of ownership. In 2006, two years before Rob proposed, the State Legislature amended land-use statutes. The amendments aimed to both educate the public about and enforce the 1988 rules for public use of state lands. Restrictions on recreational use came under increased scrutiny, and game wardens and other law enforcement officers began issuing verbal warnings for violations like driving off-road or building a campfire. We were among the many families notified that our generational camp had been illegally set up on state land, where overnight camping and campfires were prohibited.

Perhaps we were lucky to have just received a warning, because the new statutes allowed for violators to be charged with misdemeanors and levied with fines of up to \$750 or even sentenced to jail time. But we did not feel lucky to discover that a place we thought we knew had shifted beneath our feet, become unstable, threatened to unbalance us. The sliver of BLM land where camping was legal was small, just wide enough for our tents but not to park our vehicles, and we worried that we would again be in violation of the state regulations. We began making phone calls, reading statutes, looking for a way to save the old camp, the original fire ring. We hesitated to build a new fire ring on BLM land, not wanting to dig into the tender grass of the meadow without cause.

Looking back, I suppose I should have known, even as a child, just how many people had claims to that place. We knew the local ranching families who owned grazing leases throughout the part of the Red Desert where we camped. And we knew that sheep ranching claimed space and history in the desert—the old line shack was a relic of this history, and we often drove through crowds of woolly ewes and lambs in Bison Basin on our way to

camp. We were safe in the desert, but we knew better than to get out of the truck near a sheep camp protected by the Great Pyrenees dogs that snapped and barked at our tires as we passed.

Through my middle school and high school years, we began to see more activity in the desert. Recreationists in side-by-sides, arrowhead and shed-antler hunters, fishermen on the Sweetwater River. We also found that drawing antelope tags in our favorite areas became difficult as more and more people entered the lottery. And then there was the Continental Divide Trail. What we once registered only as a series of markers along dirt roads became a major attraction for hikers, and we began running into people who identified themselves with trail names rather than real names and who called us “trail angels” for offering them cold water, soda, or beer. (If they had known how my father cursed when he saw them, how he bemoaned the fact that we’d have to “go back to town to get away from all the damned people,” I doubt they would have called us angels.)

At the same time, the increased drilling in the nearby Jack Morrow Hills and elsewhere in the desert brought not only new wells and rigs, but a peak in interest from environmental groups. Suddenly, the place I had always considered one of the lower forty-eight’s best-kept secrets was being featured in magazines, newspapers, and photography installations throughout the state and even nationally. I feared that others would find it, lay claim to it, take it from me.



Wind and dust circled me, and I dropped my eyes to the white glint of a stone by my boot. I stooped and plucked from the desert a piece of worked rock, an arrowhead or a spear-point. The shoulders had snapped off, but the point itself was beautiful, uniform. I imagined the disappointment its maker might have felt, watching something so close to taking shape suddenly falling to pieces in his hands. I closed it in my palm and

continued my hike to the old juniper at the top of the stream’s canyon.

I looked down at the meadow, looked out across the desert. So much had changed in the years since Rob asked me to marry him. We had recently returned to the desert after I completed graduate school a state away in Idaho, and, while we were gone, my family had successfully applied for a special-use lease that allowed us to make a legal claim to the meadow. The lease came with two stipulations: we could not prevent other people from using the meadow, and we had to build a cabin. Though Rob and I helped as much as we could, a great deal of the construction had occurred while we were in Idaho. How strange it was to stand at the top of the draw, look down at the meadow and see a solid, new cabin there. And how strange to know that, though we owned the cabin, we still did not own the land.

We had chosen to build where the old line shack had stood rather than at the far end of the meadow by the traditional fire ring. We believed that doing so would save the soft riparian

land from being chewed up by the heavy loads and frequent truck traffic involved in building the cabin. We also agreed that building at the site of the old shack, where a structure had stood for years, would leave the majority of the meadow unchanged.

Though we thought we would trek the quarter of a mile downstream to build our fires in the old ring, we rarely did. It was easier to buy a fire-pan and set it up near the cabin. The fire ring we circled when I was a child now sat cold and dark most of the year, and grass began to grow up around the stones. I grieved the loss of that tradition, even though I recognized that we had simply relocated to the top of the meadow. As I stood next to the juniper with the spear-point in my hand, I felt the whisper of a loss I could only begin to understand, as if my own grief for the place I had known as a child was a receding echo of something richer, deeper. I wondered how much the land itself had changed in the years since the spear-point’s creation. The creek shifting, cutting new banks into the soft meadow, trees sprouting from

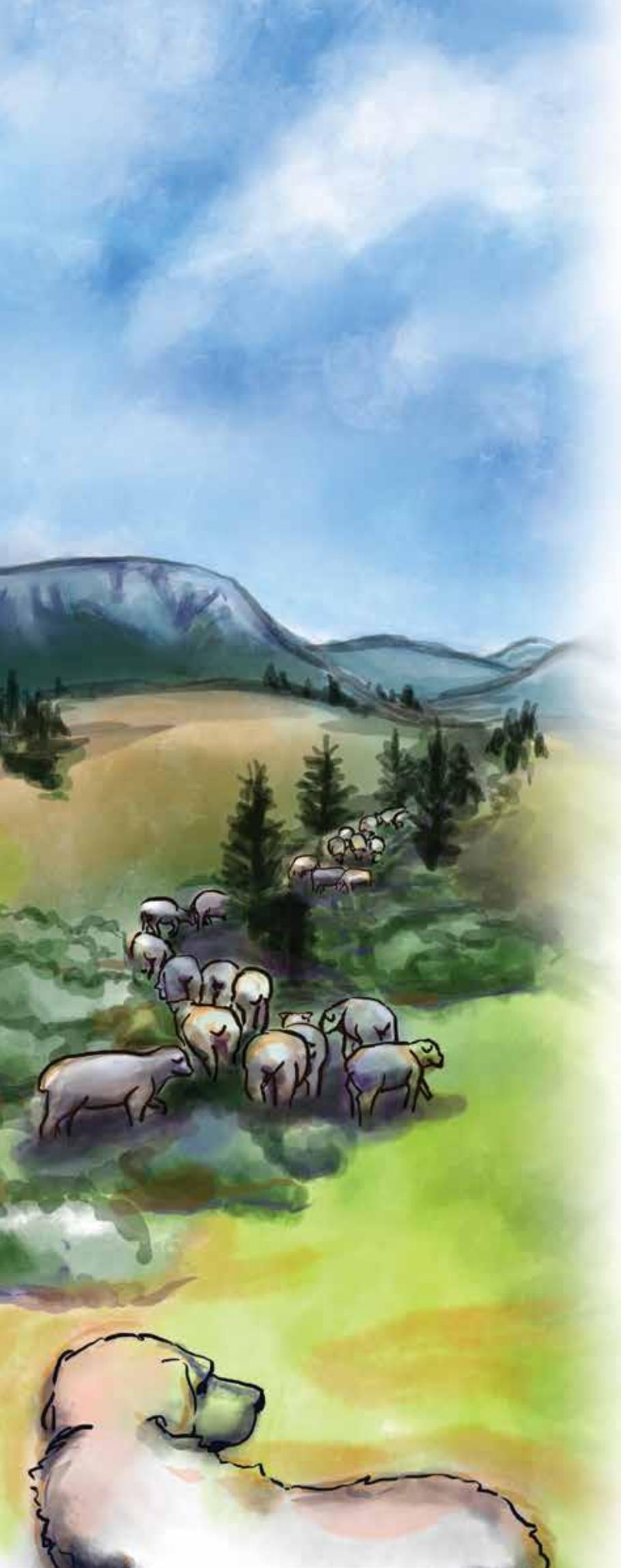
the rocky soil, then dying and falling, the wind eroding rock, sculpting new forms. Dirt roads beaten into the sage, oil wells sunk into the earth, fences spiked into the ground.

Yet the land endured, like that juniper with its roots clinging to the rock and its branches open to the sky. My family’s history with the place was but one story mapped there. The land held stories of so many people, of so many years. Our fire ring will continue to fade, and someday the cabin will fall or be torn down, just like the line shack that preceded it.

I knew as I held the spearpoint and looked over the desert that the land had shaped me more than I had shaped it, and that although it did not belong to me, I belonged to it. And I felt a kinship to all the desert’s children, to those who loved it and grieved it and made their livings from it, to all who carried stone, wind, sun, snow, and sage in their blood.

Ann Stebner Steele is a writer of literary fiction and nonfiction and a lecturer and advisor with the University of Wyoming Honors College. Find more of her work at annstebnersteele.com.





WHERE DOMESTIC

A court case challenges domestic sheep grazing on national forests

*Text and illustrations
by Marissa Fessenden*

In any court case, there are two sides. But in a wood-paneled courtroom at the Federal Building and United States Courthouse in Butte, Montana, differences between the two sides headed to court were not immediately apparent. Both groups of men and women assembled there in early March wore the practical vests, collared shirts, and dark blue jeans common to the mountain West. Both groups had left a chilly, blue-sky day to enter the courthouse. They emptied their pockets, left their phones with security and passed through a metal detector. Once the bailiff invited them into the courtroom, they sat in quiet clusters and waited for the judge to enter the chamber.

In one group, 59-year old Glenn Hockett gripped a notebook that held printouts of scientific papers he would refer to in a statement before the judge. He is the president of a small, all-volunteer, non-profit group called the Gallatin Wildlife Association and lives in Bozeman, Montana.

In 2015, his group sued the United States Forest Service to stop sheep ranchers from grazing public land in the Gravelly Mountains of southwestern Montana. At this latest hearing, the judge would consider their request for an emergency order to halt grazing in the Gravellys. It was the fifth such request they've made in addition to various motions and appeals that have moved the case forward intermittently during the past three years.

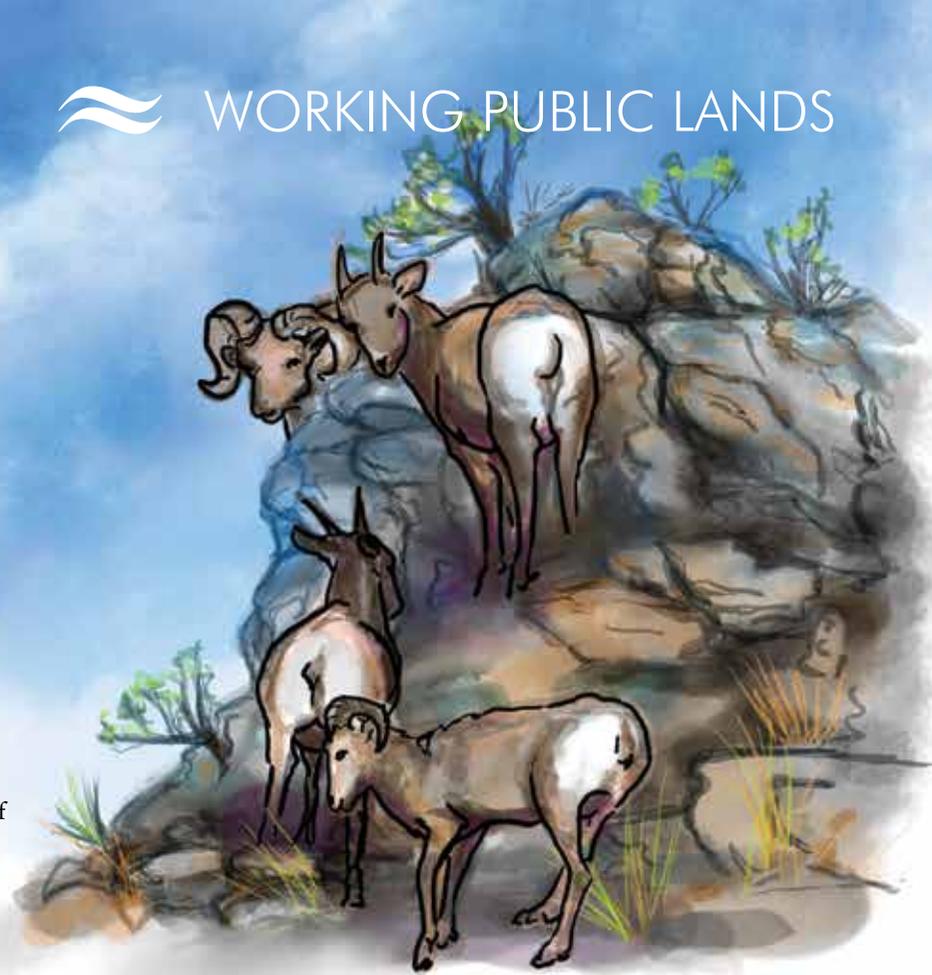
The group's main argument is that domestic sheep hinder

their use and enjoyment of public lands, primarily by threatening the survival of already-imperiled bighorn sheep, an iconic creature of the mountain West. Domestic sheep carry respiratory diseases that can kill bighorn sheep. Bighorns don't currently live in the Gravellys but one herd roams neighboring peaks to the north. Hockett and his group think the grazing allotments prevent the bighorns from moving into suitable habitat in the Gravellys. If they prevail, the case could change the future of grazing on public lands throughout the West.

The second group in the courthouse included two sheep-ranching families that live near the small town of Dillon, Montana. As they gathered, they exchanged comments about the courthouse security process, a routine that had become distressingly familiar. Among them was John Helle, 54, a third-generation sheep rancher and managing partner of Helle Livestock. If the judge issues an emergency order, these families would have to scramble to find new summer grazing land for thousands of sheep. It could be devastating to their livelihoods, Helle says.

The case is just one of several challenging sheep-grazing rights in recent years. Vulnerable bighorns, public land allotments for domestic sheep, and the evolving culture of the new West form a potent mix for conflict. At the heart of the issue is the challenge of balancing wildlife conservation on public lands with natural resource uses that support the livelihoods, character, and open landscape of the West. Sheep

SHEEP STILL ROAM



ranchers, with their long history in the region, want to remain on allotments administered by the U.S. Forest Service and the Bureau of Land Management. Wildlife advocates counter that domestic sheep hinder the reestablishment of healthy bighorn sheep populations. Individuals from both sides comb through scientific literature to find support for their views. They come to very different conclusions about what should be done for sheep management.

Nearly two million bighorn sheep once occupied the West, but their numbers plummeted to a few thousand by the early 1900s due in part to overhunting. Disease was another major factor. Domestic sheep are the carriers of respiratory illnesses to which bighorns have no resistance, experts now think. Once a herd contracts one of these illnesses, the pathogens remain in survivors and infect new lambs—a pattern that has affected herds across the West. Although restoration efforts bolstered the population to about 80,000 today, many herds remain small, isolated, and therefore easily killed off entirely.

In the court room that day, four different attorneys presented arguments to U.S. District Court Judge Brian M. Morris. Previously, Judge Morris had declined to halt grazing, though in 2016 he ruled that the Forest Service had failed to fully consider the impacts of two agreements made with sheep ranchers, didn't disclose the agreements to the public, and violated the National Environmental Policy Act in the process. Part of the agreements detailed that the ranchers should shoot on sight any bighorn spotted near domestic sheep. That dramatic action was posed as the last chance that managers had to ensure that an individual bighorn sheep wouldn't

take disease back to its herd. But it gave authority and responsibility to ranchers.

This time, the Judge Morris reminded the Forest Service of that failure and emphasized that they had not stuck to their own proposed schedule for resolving the issue. The judge added that unfortunately, the people who suffer the consequences of the delay are the two sheep ranching families that graze the allotments. "I have protected them so far," he said. "But at some point, the Forest Service has to do its duty and follow the law."

Both sides would have to wait weeks for Judge Morris to issue his next decision.

In a Bozeman coffee shop a few weeks later, Hockett explained that his passion for bighorns goes back decades. In the early 1980s, he advocated for bighorn sheep to be reintroduced in the Tendoy, a mountain range about 50 miles southwest of the Gravellys. "I kind of grew up with this herd," he says. "I watched it, knew it, went over there to view it." In 1993, he drew a hunting tag for a ram in the Tendoy herd, which at that time numbered more than 150 animals. His wife, Laurie, drew a ewe tag the same year. The hunt was successful and, to the Hocketts, a celebration of conservation efforts that created a herd viable enough to be sustainably hunted. But the winter after the hunt, pneumonia swept through the herd. Montana Fish, Wildlife and Parks counted only 28 sheep later that year, none of them lambs. "It was really disheartening, really shattering," Hockett says.

If any bighorn sheep still roam the Tendoy, they are likely the last of that herd. After the animals struggled for years against respiratory illnesses, Montana Fish Wildlife and Parks issued unlimited hunting tags

in 2016 with the goal of eradicating the remainder of the Tendoy herd. With a clean slate, the agency could reintroduce healthy bighorns to the range in the future.

Given the risk to bighorns, wildlife managers encourage separation between domestic and wild sheep. Montana Fish Wildlife and Parks' conservation strategy requires domestic sheep to stay 14 miles away from bighorns. Yet domestic sheep, whose meat, milk, and wool helped European-Americans settle the West, often live near or in suitable bighorn sheep habitat. Some of those lands are grazing allotments on public lands historically established for livestock use. While many domestic sheep grazing allotments have been retired due to declines in demand for wool as synthetics arose, some still remain.

In early April, the domestic sheep that graze the allotments in the Gravelly mountains started lambing. Helle checked on the progress in his lambing and shearing barn. There, three ranch hands moved between pens, working together to scoop up newborn lambs and dip their umbilical cords in disinfectant. Helle greeted them and then surveyed hundreds of ewes milling in a fenced

yard out in the sun, still round with their unborn young.

"I'm just super, super frustrated with the whole thing right now," Helle says. He fears that the goal of the lawsuits is to disrupt ranching operations, rather than arrive at a conclusion informed by best management practices. "I don't think it's a way that we solve any issues here in the West, where we've been conservation-minded ranchers for years."

Finding last-minute summer grazing grounds for the 10,000 sheep the ranch shears every year could prove impossible, Helle says. Even if land were available, the change would jeopardize his business. The Rambouillet breed the ranch keeps produces soft, curly wool for Duckworth, Inc., an apparel company co-owned by Helle that produces long underwear, pullovers, and more. In a declaration submitted to the court, Helle argues that the cool summers their sheep spend in the Gravellys' high country are responsible for Duckworth wool's unique properties.

On his ranch, Helle looked over the backs of the ewes waiting to lamb and up a series of sage- and grass-covered benches toward the Gravelly Mountains. His sheep would take a

meandering path across that landscape later that spring to reach national forest land in the mountains by July 1. “All this land evolved under grazing of some sort, whether it’s buffalo, bighorn sheep, or deer,” Helle says.

Like many in agriculture, Helle has a strong sense of stewardship over the land where he lives. Classes in range management and animal science at Montana State University supplement his years of observations and generational knowledge about the lands his sheep graze. “If you don’t graze it, it tends to get really rank and prone to fire,” he says. “When you remove grazing, it’s just like if you removed fire from timber: You get a non-succession type vegetation.” Grazing the land keeps it open and available for bighorn sheep to use it as their winter range, he says.

Helle pulled out his iPad to show photos of the sheep in the high country last summer. He pointed beyond the grazing sheep in one photo to slopes covered with dead trees.

Whitebark pine, killed by bark beetles. But a few green trees still stand amid the dead ones. He wondered if they have some kind of resistance to infestation. He sees a clear parallel to bighorn sheep.

Helle said he finds it puzzling that after a bighorn herd suffers a die-off, wildlife managers may kill the remaining animals. “Applying my genetic and animal selection science to that, I’d say ‘Wow, those sheep survived.’” Perhaps those are the sheep to keep around, not to kill off.

Hockett also looks to science to support his position. In the Bozeman coffee shop, Hockett paged through his printouts of scientific studies. He paused conversation to find a particular highlighted passage. Montana Fish Wildlife and Parks says that minimum number of bighorns needed to create a self-sustaining herd is 125, but Hockett’s highlighted passage—a technical discussion about the genetics of small populations—pushes that number up to 200. He can rattle off the official population counts of bighorns in the mountains north of the Gravellys for the past several years. “They’ve never counted over 80,” he says. Given his read of the science, that means the group isn’t likely to survive without a chance to expand into the Gravellys themselves. He says he fears that politics are overshadowing scientific understanding.

As in all scientific fields, the actual research surrounding bighorn

sheep and disease is ever evolving. Helle is right, some bighorns don’t die after exposure to pathogens. Robert Garrott, professor of ecology at Montana State University in Bozeman is learning what he can from those survivors. He runs two ongoing projects—one surveying bighorn herds in and around Yellowstone National Park and another studying herds across Montana. Nearly 4,000 bighorn sheep live in connected herds east of Yellowstone, thriving when other herds have failed. Garrott and his colleagues sampled more than 20 herds in and around Yellowstone, swabbing their noses and tonsils for pathogens that cause respiratory diseases. They’ve found that about 75 percent of the herds already have bacteria suspected to cause die-offs including pneumonia-causing species of *Pasteurellaceae* and *Mycoplasma ovipneumoniae*.

“That was very different from what people were thinking,” Garrott says. Many of the herds appeared healthy. The findings tell Garrott that not all die-offs may be caused by recent contact with domestic sheep. Many could be caused by bacteria already in the herd that flare up and kill due to some additional stressor or genetic weakness scientists have yet to understand.

Does that mean that Helle’s sheep could graze in the Gravelly’s alongside bighorns without fear of disease transmission? No, Garrott explains that much more research would be needed to draw such a strong conclusion. For now, bighorns are best protected by the 14-mile separation. The differences in whether bacteria can cause sickness and spread quickly likely vary from strain to strain. Even if a particular herd of bighorn has the same species of bacteria as a herd of domestic sheep, different strains could cause new die-offs.

In the meantime, agencies have to make management decisions with current available science. The lag between new scientific findings and current management practices gives space for concerned individuals to

step in through the legal system.

Hockett and the Gallatin Wildlife Association also have a case pending to halt grazing in another mountain range, where the Dubois, Idaho-based Agricultural Research Service Sheep Experiment Station grazes domestic sheep. These legal battles are part of a recent history of litigation challenging grazing allotments across the West. In some instances, the status quo and therefore the domestic sheep interests prevail. In a 2017 Wyoming case, the judge allowed the Forest Service to continue grazing allotments in the Medicine Bow National Forest because the bighorn population was viable in other areas of the Forest. In Idaho and California, the Forest Service closed portions of its lands to domestic sheep grazing allotments, sparking court challenges. In those cases, the decisions fell in favor of wild sheep conservation. In Utah, conservation groups have bought up grazing allotments from ranchers to get domestic sheep off the land and return habitat to bighorns. Many small battles add up to a landscape-wide conflict of push and pull between competing values.

In mid-April, Judge Morris denied the motion for an emergency order in the Montana case. Domestic sheep grazed this summer in the Gravellys, watched over by ranchers on horseback. In his ruling, the judge wrote that the Gallatin Wildlife Association did not meet the legal standards needed to justify an emergency order to halt grazing. Those standards are high and very little science figured into this particular decision. But the main case remains undecided, as the Gallatin Wildlife Association is appealing an earlier ruling.

Helle and Hockett will once again climb the steps of the courthouse in Butte to sit separately in the courtroom while their attorneys argue over the fate of two different species of sheep in the Gravellys.

Marissa Fessenden is a freelance journalist and illustrator based in Bozeman, Montana.

SHARING | FENCES

Local knowledge guides research across public and private lands

By Lauren Connell and Courtney Duchardt

“I’ve learned to tune out the incessant alarm calls of prairie dogs when I work,” says recent University of Wyoming graduate Lauren Connell. “It’s that or go crazy.” For the past three summers, Lauren has been measuring rangeland vegetation throughout the Thunder Basin National Grassland to understand how disturbances like prairie dogs and wildfires affect livestock forage and wildlife habitat, two main priorities for ranchers and public land managers in this region.

Poised on the transitional zone or “ecotone” between the Great Plains and sagebrush steppe, Thunder Basin boasts characteristics and wildlife of both a grassland and a shrubland. In this unique landscape, beef cattle and sheep graze alongside prairie

dogs, native ungulates, and birds like greater sage-grouse, burrowing owls, mountain plovers, and raptors. The secret of this diversity lies in its location. The landscape receives extra precipitation from the Great Plains to the east, but supports shrubs normally found in the high desert to the west. This unusual mix of temperature and precipitation means much of our knowledge gained through research and management in the Western Great Plains or high desert may not apply here. For example, models created to predict the behavior and effects of wildfire in the sagebrush steppe don’t work well in this ecotone. As such, managers and researchers are forced to rethink how these paradigms and approaches will apply to this unique landscape.

An additional management challenge in Thunder Basin is the

mosaic pattern of public and private land ownership. Following the Dust Bowl of the 1930s, a federal land buy-back program resulted in public land interspersed among private holdings, often within the same pasture. In addition to ranching and wildlife, Thunder Basin also contains significant energy development, including the world’s largest surface coal mine. Although land ownership is mixed in Thunder Basin, wild animals don’t care about human boundaries, so managing these resources requires a joint effort by stakeholders working on both public and private lands.

A non-profit group of 39 local ranchers, landowners, and energy representatives is rising to those challenges. The Thunder Basin Grassland Prairie Ecosystem Association (TBGPEA—read “tuh-BUG-Pea”), led by Executive

Director David Pellatz, partners with other non-profit organizations and local, state, and federal government entities to promote conservation and sustainability on working ranches. In the Thunder Basin National Grassland, TBGPEA works alongside the US Forest Service and other partners to help manage these working lands for humans and wildlife, creating management plans that balance diverse interests like energy development, ranching, and wildlife conservation. After almost 20 years of sharing fences and working together, TBGPEA and the US Forest Service agree: sound, locally based science is needed for the management of this vast region of mixed ownership, colliding ecosystems, and different land uses.

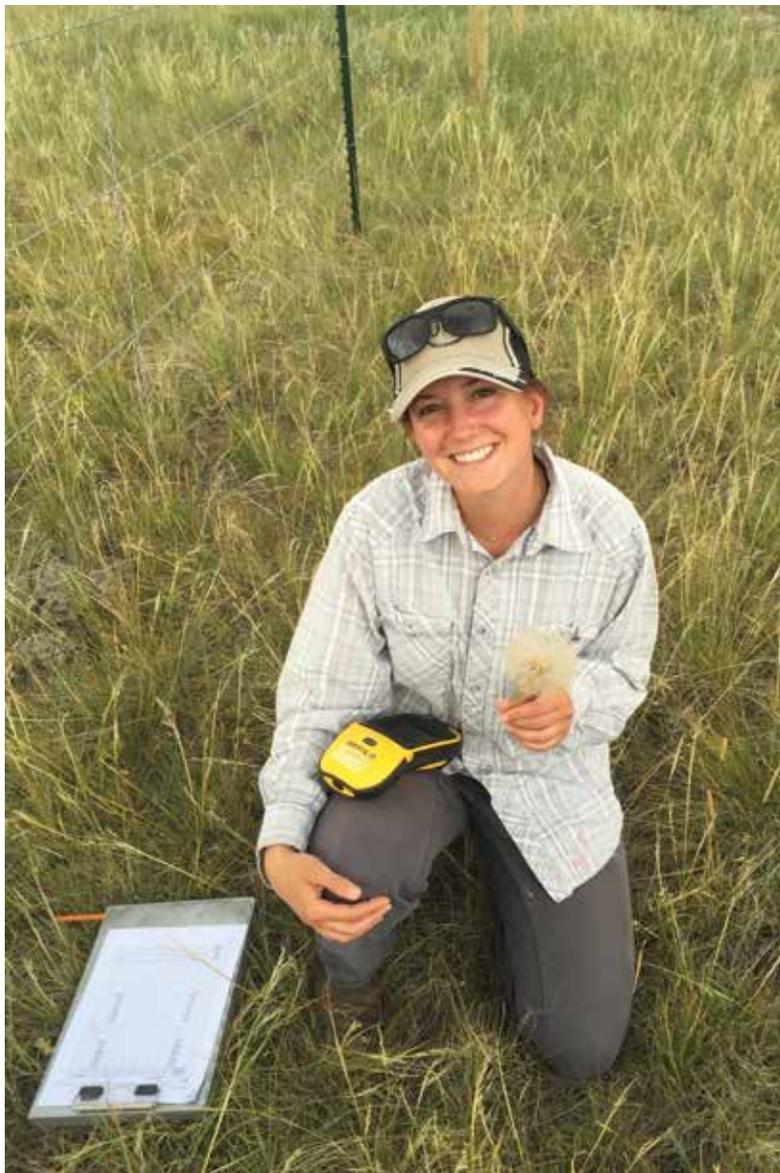
That’s why TBGPEA led the effort to collaborate with scientists



The Thunder Basin National Grassland in northeast Wyoming supports a variety of land uses from energy development to livestock grazing, and wildlife species such as greater sage-grouse, mountain plover, and black-tailed prairie dogs.



Courtney Duchardt (right) works with USDA Agricultural Research Service ecologist David Augustine to study how birds use habitat in the Thunder Basin National Grassland for her PhD in ecology from the University of Wyoming.



Lauren Connell researched how disturbances like grazing and wildfire interact to affect plant communities and forage production in the Thunder Basin National Grassland for her recent master's of science in rangeland ecology and watershed management from the University of Wyoming.

from the Agricultural Research Service (the research arm of the US Department of Agriculture) and the University of Wyoming Agricultural Experiment Station. The collaboration among TBGPEA, the Forest Service, and these two research institutions led to the creation of the Thunder Basin Research Initiative in 2014. The Research Initiative is a collaborative process—ranchers and land managers work with researchers to identify challenging management questions, generate research programs, and obtain funding to answer these questions. For example, how much forage grows during years of high, low, or average rainfall, and will there be enough for both livestock and native grazers? Does livestock grazing expose bird nests to predators? Conversely, is cattle and prairie dog grazing needed to ensure adequate nesting habitat for birds that require short grass? The Research Initiative helps answer these and other questions with rigorous science. In 2015, two University of Wyoming graduate students, Courtney Duchardt and Lauren Connell, joined in this effort.

Courtney's research focuses on bird species of conservation concern whose populations are declining throughout North America from habitat loss or changing land use. Thunder Basin is a boon for conservationists because it provides habitat for both grassland and sagebrush birds—two bird guilds for the price of one. But more habitat for grassland birds means less for sagebrush birds, so the Thunder Basin Research Initiative wanted to know how much habitat each bird guild needs to persist in this landscape.

One species of conservation concern is the mountain plover, a bird that requires a lot of bare ground for nesting. In Thunder Basin, the mountain plover benefits from prairie dogs, which create islands of short grass and bare ground in a sea of taller grasses and sagebrush. But not every wildlife species benefits from prairie dog disturbance. The greater sage-grouse, for example, requires expansive sagebrush for

winter forage and brood rearing, which is generally absent on prairie dog colonies. Courtney has been monitoring the bird community in Thunder Basin for the past four years to better understand how many prairie dogs are enough for the mountain plover, and how many are too many for the sage-grouse. "It's really about striking a balance between the needs of these very different wildlife species," Courtney explains, "and at a larger scale, balancing the needs of wildlife management and other stakeholders in the landscape to maintain this biodiverse region for future generations."

Although prairie dogs are crucial in creating mountain plover habitat, they're a concern for ranchers. Cattle can have a hard time accessing enough grass, and thus gaining weight, when they share pastures with prairie dogs. Local stakeholders asked the Thunder Basin Research Initiative, when it comes to prairie dogs and livestock, is there enough grass to go around? That's where Lauren's research comes in. She studied how prairie dogs, fires, and grazing animals influence both wildlife habitat and livestock forage. She found these disturbances sometimes alter vegetation communities in surprising ways in Thunder Basin. For example, Lauren expected herbaceous vegetation like grasses and forbs to flourish without livestock grazing. Instead, she was surprised to learn the height and density of herbaceous vegetation was very similar between un-grazed areas and those grazed by livestock at light-to-moderate stocking rates. She also confirmed that while fires effectively eliminate shrubs like sagebrush, they don't reduce overall plant cover because herbaceous vegetation can recover rapidly following fire. Another interesting finding: although prairie dogs can reduce the amount of grass on their colonies, the remaining grass contained more nutritional benefits than grass found outside of prairie dog colonies. "Most people don't realize grass on prairie dog colonies can be more nutritious for grazing animals but for livestock the benefits aren't

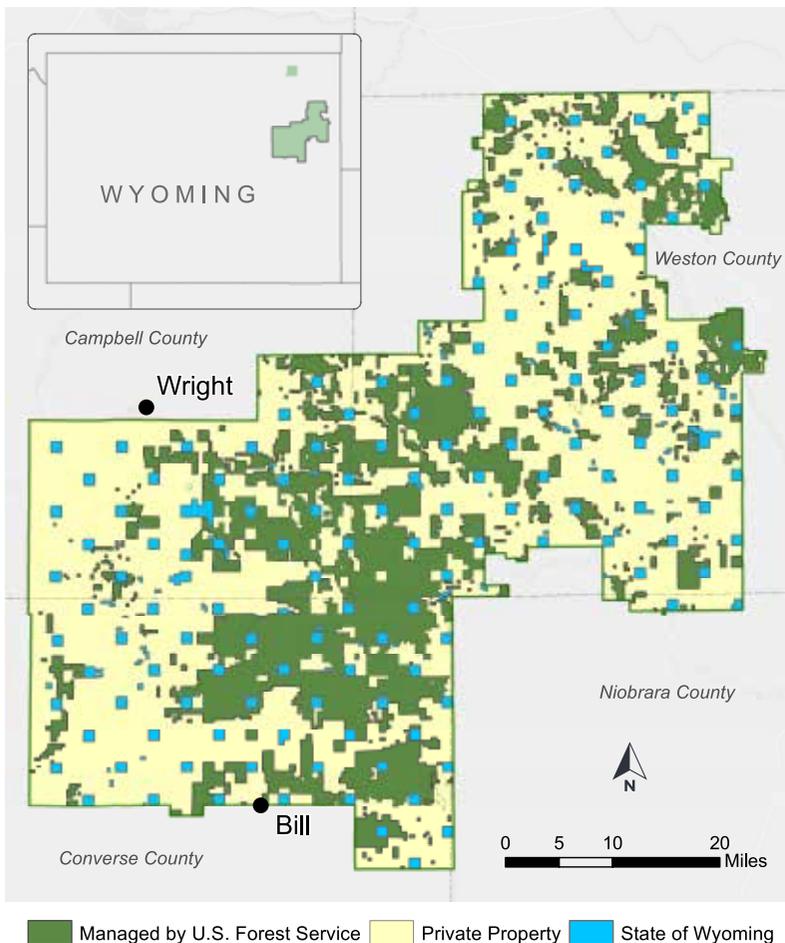
always enough to compensate for the reduction of grass,” Lauren explains.

So, what does this all mean? A mosaic of habitats in Thunder Basin, including areas with and without prairie dogs, may give cattle the flexibility to graze high-quality grass on prairie dog colonies when it’s available, then move off-colony when they want to find more grass. Such a mosaic is necessary for the birds too, since species like the greater sage-grouse need extensive areas of sagebrush, whereas mountain plovers need bare ground. These results are clarifying the best ways to balance the needs of ranchers and wildlife in this system.

Just as the landscape is dynamic, the Thunder Basin Research Initiative

has grown and changed over its first four years. Sharing fences in Thunder Basin is one of its greatest strengths—by communicating across the boundaries of background and land ownership, ranchers, managers, and researchers can really get at the heart of these issues. As part of this dynamic community, they’re constantly benefitting from seeing the grassland from a different perspective. This helps the team to hone in on particularly challenging and rewarding research questions. Although it might be easier to work in a less complicated system, they like the messiness; in this ecotone, there’s always something new to learn.

Wild animals don’t care about human boundaries, so managing these resources requires a joint effort by stakeholders.



The Thunder Basin National Grassland includes a patchwork of land ownership that complicates management.

Courtney Duchardt is in her fourth year of her ecology PhD at the University of Wyoming working under **Professor Jeff Beck** and **David Augustine** of the USDA-ARS. **Lauren Connell** is a private lands wildlife biologist for Bird Conservancy of the Rockies in partnership with the Natural Resources Conservation Service in Gillette, Wyoming. **Lauren** earned her master’s degree from UW in 2018 under **Professor Derek Scasta** and **Lauren Porensky** of the USDA-ARS.

Direct financial support for the Thunder Basin Research Initiative was provided by USDA-Agricultural Research Service and the Wyoming Agricultural Experiment Station

through funds received from USDA-Research, Education, and Economics non-assistance cooperative agreement 58-5409-4-011 and USDA National Institute of Food and Agriculture, McIntire Stennis project 1006367.

FURTHER READING

L. C. Connell, J. D. Scasta, and L. M. Porensky, “Prairie dogs and wildfires shape vegetation structure in a sagebrush grassland more than does rest from ungulate grazing,” *Ecosphere* (August 2018), <https://doi.org/10.1002/ecs2.2390>.

Courtney J. Duchardt, et al., “Disturbance shapes avian communities on a grassland-sagebrush ecotone,” *Ecosphere* 9 (2018). Open Access.

THE SURPRISING STORY OF CHEATGRASS IN THE THUNDER BASIN

In the sagebrush-steppe of the Great Basin, which lies 400 miles southwest of Thunder Basin, catastrophic wildfires are becoming more commonplace. In this region, fire promotes cheatgrass and cheatgrass, in turn, promotes fire, creating a “positive feedback loop” and leading to more frequent and hotter-burning wildfires. Under these conditions, cheatgrass can outcompete native vegetation by capitalizing on resources in a recently burned area—to the detriment of native plants. Even worse, cheatgrass makes an excellent fuel source for new fires, which reduce habitat for sagebrush-dependent wildlife like the greater sage-grouse. Cheatgrass is a short-lived forage resource for livestock and wildlife, and contributes to poor rangeland quality.

In response to questions posed by the Research Initiative, Lauren Porensky and Dana Blumenthal at the USDA-Agricultural Research Service began to investigate whether this cycle occurs in the same way in Thunder Basin. They compared cheatgrass density inside wildfire areas (burned 2–26 years ago) to nearby, paired locations that were unburned. Their study found that wildfires do not promote cheatgrass in Thunder Basin. In this ecotone, summertime precipitation helps native vegetation fight back against cheatgrass. Armed with this new information, managers can now focus their resources on other ecosystem threats. These findings are just one example of how collaboration within the Thunder Basin Research Initiative can shed new light on decades-old management challenges.

For more information on this research see L. M. Porensky and D. M. Blumenthal, “Historical wildfires do not promote cheatgrass invasion in a western Great Plains steppe,” *Biological Invasions* (July 2016) 3333–3349, doi:10.1007/s10530-016-1225-z.



Bullies on the Range

Wild horses are winning out over wildlife in the struggle for water

By Nicole Korfanta

On a summer day in 2011, biologist Neil Perry was checking on prairie dogs he had translocated to a remote canyon in Mesa Verde, National Park, not far from the Four Corners region. At the base of the canyon was a spring, lifeblood to critters in this arid place. As an elk hunter, he took a minute to watch a half dozen elk single-file it toward the water. Just then, a large white stallion and his band of horses, “busted in and chased the elk up the hill,” Perry recalls. It was the same horse that had charged and chased him off the site the week previous. After that incident he thought, “Man, these guys can be pretty mean.” Now it was the elk’s turn to flee. The standoff lasted for the remaining hours that Perry finished his fieldwork—the horses guarded the spring while the elk watched from the hillside above, blocked from accessing the water.

The next year, Perry mounted camera traps at the spring to see if horse bullying was a fluke or

something more. The 100,000-plus digital photos of the spring showed elk and a few mule deer, but mostly wild horses—lots of horses. As he flipped through the sequences, the same story would emerge and repeat: as elk approached the spring, more often than not, horses ran them off. Out of 51 “interaction events” between horses and elk, only one brave (or very thirsty) cow elk and two rutting bulls made it past the horses. And because the horses tended to lollygag at the spring, elk and deer had few opportunities to visit the spring without encountering them. For all but horses, the spring may as well have been dry.

Elk probably arrived in Mesa Verde within the last 50 years, but mule deer were there long before horses, says Perry. Without a historical record, he can only speculate about what those interactions cumulatively mean: “There are a lot of deer in that canyon, but there aren’t as many as there should be. Horses have probably been excluding deer for decades.”

This same scene is playing out across the West, probably even right now as you read this. Wild horses are blocking other ungulates from accessing the water sources they need to survive in arid climes. Perry’s findings, published as a note in the journal *Southwestern Naturalist* in 2015, confirmed an earlier study showing that desert bighorn sheep in southern California bug out when horses arrive at a watering hole. Same too in the Great Basin of western Utah and in Nevada, where separate studies showed that mule deer and pronghorn visited water sources less often when horses were around. While Perry documented direct aggression, each of these studies found that just the presence of the socially dominant horses was enough to repel animals from watering holes and cause them to spend more time being vigilant. The authors of the Nevada study speculated that all that energy spent eyeing horses while not eating and drinking was enough to reduce the health and fitness of pronghorn there.

Horses outcompeting other ungulates for water adds to another problem in arid climates and drought years. Biologists and range managers have long suspected, and recent research confirms, that wild horses also compete with livestock and other ungulates, especially elk, for food. Their diets overlap and horses are voracious eaters. Competition from horses for food and water is a one-two punch for native ungulates in the arid West.

To some, what to make of this horse-wildlife competition for scarce resources depends on whether horses are native to the western landscape. A couple of small prehistoric horse species did roam North America during the Pleistocene some 14,000 years ago, together with camels and saber-toothed cats, before they all went extinct here. But, “at the time when horses did evolve here naturally, they were in a different ecology, a different suite of predators, and we don’t have that now,” says Perry.

Today’s US wild horse population

grew from domesticated horses that got away from Spanish conquistadors in the 1500s, and later, from the US Cavalry. Federally protected wild horse herds continue to mix with escaped ranch horses and those from tribal lands. All horses we think of as “wild” today are in fact descended from a domesticated variety that likely evolved somewhere else besides North America. To biologists, wild horses are feral.

To the public, the native-feral distinction is less clear and perhaps less important. What matters is that wild horses are protected by the 1971 Wild and Free-Roaming Horses and Burros Act, which codified the growing public perception of horses as “living symbols of the historic and pioneer spirit of the West” and “an integral part of the natural system of the public lands.” The Act, passed in response to public outrage over wild horse management that included mass round-ups, aerial gunning, slaughter programs, and even poisoning of water sources on public land, called for the US Forest Service and Bureau of Land Management to manage and protect wild horses from killing or harassment where they were found roaming at the time the act was passed. The 1971 act allowed for removal or destruction of old, sick, or unadoptable horses, and even healthy horses if range conditions deteriorate. But Congress, responding to public pressure, has so far nixed the killing of healthy wild horses through riders on annual appropriations bills.

Thanks to federal protection and the absence of many natural predators, the wild horse population near Mesa Verde and in many places in the western US, has exploded. As of March 2018, the Bureau of Land Management estimated the wild horse population at 67,000 West-wide. Horses are famously difficult to count. But if the estimates are close, that’s over three times what BLM deems an Appropriate Management Level—the number of horses and burros “that can thrive in balance with other public land resources and uses,” including domestic livestock grazing and wildlife objectives. With an average annual

As he flipped through the digital photo sequences, the same story would emerge and repeat: as elk approached the spring, more often than not, horses ran them off.

population growth rate of 20 percent per year, herd sizes can double every four to five years if unmanaged.

The sheer number of wild horses competing for limited range resources means that they often compete against one another too. After his initial study, Perry left his cameras at the spring. During a dry year, the photos again revealed a struggle as horses prevented other horses, mostly the youngest and the oldest of the band, from getting to the shrinking spring. “I watched

that stallion—who had been a really strong, powerful animal—when the water got so depleted, just wither down to almost nothing,” Perry remembers. “I thought that he was going to die.” He didn’t, but three or four other horses in the stallion’s band did. Their bodies joined the dozen or so horse skeletons that have come to encircle the spring through the generations. His observation was not an isolated one. In 2018, tribal officials reported that 191 horses were found dead, stuck in a drying-up stock pond on Navajo land in Arizona. Such gruesome scenes may grow with the expanding horse population.

What’s a range manager to do as horses proliferate and compete with each other and other species for scarce water? Perry says they can fence out horses from artificial wildlife watering holes called “guzzlers,” still allowing access by native ungulates. But that’s a short-term, small-scale fix for a problem that will only continue to grow.

Angela Yemma, a range

conservationist who worked near Navajo Dam, New Mexico, is studying range conditions in light of a wild horse population that’s over five times the local population objective. Yemma agrees that reducing conflicts with wild horses requires something bigger. “I think the only way to manage for it is to get the numbers appropriate on the range to try to reduce some of that competition.”

Deciding on appropriate horse numbers and how to get there is another story. With euthanasia effectively off the table, BLM gathers and pastures excess horses, although facilities are almost maxed out. Limited birth control and adoption of some horses account for the remainder of BLM’s wild horse management—not nearly enough to stabilize the population. The Wild and Free-Roaming Horses and Burros Act calls for federally designated wild horse population levels to be managed “to achieve and maintain a thriving natural ecological balance on the public lands.” The notion of “balance,”



Camera trap photo showing wild horses chasing an elk away from the spring.

Photo courtesy of Neil Perry



difficult to measure and now mostly abandoned by ecologists in favor of dynamic models, is a challenge to achieve when managing for multiple uses and without significant natural predation to regulate populations.

“The trial has been done for the last 30 years,” says Perry. “We are incapable of managing that in an ‘ecologically balanced’ way ... We need to change that.”

Frustratingly, a 2013 National Academy of Science report found that current management strategies are probably increasing the horse population growth rate by reducing density-dependent factors that would otherwise slow growth. That is, removing some horses improves conditions for remaining horses, allowing them to survive and reproduce even better. And yet, that same National Academy study says that “the consequences of simply letting horse populations ... expand to the level of ‘self-limitation’—bringing suffering and death due to

disease, dehydration, and starvation accompanied by degradation of the land—are also unacceptable.” Added to the unacceptable consequences, an ever-expanding horse population means that other wildlife species lose out as they compete unsuccessfully against horses.

Wild horses are not allowed within national parks like Mesa Verde. And yet, there they were at Perry’s spring in a remote canyon of the park. It’s not clear how they got there—Perry says they probably walked through a broken fence adjacent to the neighboring Ute tribal land. Park staff set about trapping the horses and, through a cooperative agreement with a local horse advocacy group, began moving them to a nearby ranch. But pressure from national horse advocacy groups forced park management to reconsider and trapping efforts were suspended. Now horse removal is in the cards again following a recently signed Environmental Assessment to remove horses from all of Mesa Verde,

Thanks to federal protection and the absence of many natural predators, the wild horse population near Mesa Verde and in many places in the western US, has exploded.

nearly six years after the park started the process.

“It’s a big policy step for one of the agencies to make that happen,” said Perry. If Mesa Verde is any indication, similar responses in other places with wild horses will be slow and contentious. Scientific evidence that wild horses are outgunning other wildlife is clear, but management solutions that also account for the public’s love of horses are much less so.

Nicole Korfanta directs the University of Wyoming Ruckelshaus Institute of Environment and Natural Resources and is an editor for *Western Confluence*.

FURTHER READING

National Research Council, “Using Science to Improve the BLM Wild Horse and Burro Program: A Way Forward,” Washington, DC: The National Academies Press (2013) <https://doi.org/10.17226/13511>.

Bureau of Land Management Wild Horse and Burro Program. Read reports, learn about adoptions, and see the latest on wild horses. <https://www.blm.gov/programs/wild-horse-and-burro>.

Neil D. Perry, et al., “Dominance of a natural water source by feral horses,” *Southwestern Naturalist* 60 (2015):390–393.

TRACKING WILD HORSES

Technology addresses a rangeland challenge

By Jacob D. Hennig

As the sun sets over the stark Skull Creek Rim, I sit in the sand and take a swig from my water bottle. I am lucky to have portable water in this barren landscape. Earlier in the day I walked several miles across the Red Desert to track down and evaluate the fit of a GPS collar on a wild horse, part of a study about how horses move across this vast landscape. I found the horse in question, along with dozens of others, yet never came across any water.

Wild horses, perhaps the most iconic species of the American West, have existed in North America since the 16th century, yet we know remarkably little about their movement habits or habitat preferences. The last study of wild horse home ranges in Wyoming is over 40 years old, and more up-to-date and accurate information is needed to inform management activities. GPS (global positioning system) technology, which has improved understanding, management, and conservation for vertebrate species around the world, has barely been used to study these animals. As a PhD student in the Department of Ecosystem Science at the University of Wyoming, I am working with professors Derek Scasta and Jeff Beck, using GPS technology to examine wild horse movements, home range sizes, and habitat selection for the first time in Wyoming. Our goal is to increase understanding of horse ecology to help the Bureau of Land Management (BLM) better manage the species.

The history of horses in the US provides context for this surprising lack of data. During much of the 19th and 20th centuries, widespread “mustanging,” or capturing wild



One of Hennig’s collared horses uses a summer range (brown hashed area) that spills out of the herd management area, spans private land (white), and even crosses a state line.

horses for sale or slaughter, occurred across the western US. Public outcry over harsh treatment of these animals manifested through a letter-writing campaign and the Hollywood movie *The Misfits*, and led Congress to pass the Wild Free-Roaming Horses and Burros Act in 1971. The act designates wild horses and burros as natural parts of the ecosystem and mandates that the BLM and US Forest Service provide habitat to sustain populations in areas they occupied as of 1971. Today, 177 designated Herd Management Areas (BLM) and 53 Wild Horse and Burro Territories (US Forest Service) are spread over 10 western states.

Since passage of the Wild Free-Roaming Horses and Burros Act, horse and burro numbers have increased substantially, with a current population nearly three times the maximum appropriate management level set by the BLM to maintain a thriving ecological balance. To reduce numbers, the BLM rounds up horses and burros for adoption or holds them in off-range facilities, yet the on-range populations can still double every four years. With legal restrictions on destruction of horses or burros, no natural predators, waning adoption demand, and financial constraints to off-range holding facilities, the federal government faces a huge challenge. This large horse population stresses public lands, which also support other uses including permitted livestock grazing, recreational activities, and habitat for wildlife like pronghorn and greater sage-grouse. For example, horse-occupied sites in Nevada had lower plant biodiversity, altered small-animal communities, and more soil compaction than similar sites without horses.



Meanwhile, because of horses' and burros' protected status, any proposed research is subject to scrutiny from the general public. In the 1980s, rigid, heavy, and improperly fit radio-tracking collars injured horses during a telemetry study in Nevada. Since then, horse-welfare advocates have opposed use of tracking collars to study horses and burros. Recently, improved collar designs and decreased weight of the units have potentially made the collars safer, leading the BLM to allow a few researchers, like myself, to conduct GPS-based studies.

Management agencies need modern data on where horses go and what drives their selection of home ranges. That need propelled the Wyoming Department of Agriculture and the BLM to fund our research. These agencies are interested in how much time horses spend outside of Herd Management Areas, on privately owned land, and outside the state of Wyoming itself. To begin answering these questions, we partnered with the BLM and US Geological Survey

Wild horses, perhaps the most iconic species of the American West, have existed in North America since the 16th century, yet we know remarkably little about their movement habits or habitat preferences.

to gather horses via bait-traps and helicopter round-ups in the Adobe Town Herd Management Area in southcentral Wyoming. Beginning in February 2017, we fit adult mares with GPS collars that record precise locations every two hours and last for two years. The collars also communicate via satellite to send locations every 24 hours directly to my computer, letting me know in almost real-time where the horses are so I can begin working with the data immediately. I will use the GPS

points to estimate the horses' daily movement lengths and average home range sizes. I will also examine the importance of different landscape characteristics to horses. For instance, how far do horses travel away from water sources, and do they prefer to spend time in predominately open areas or sites with rougher terrain? We also placed GPS transmitters on pronghorn and greater sage-grouse to investigate to what degree these three species overlap in habitat use. We published preliminary results in the spring 2018 issue of *Human-Wildlife Interactions* and should be publishing full results in 2020.

While my research is still in its nascent stages, the data gathered thus far are already yielding important results. By calculating home ranges of different horses, we can see that several individuals either live outside of the Adobe Town Herd Management Area, occupy multiple Herd Management Areas, or even spend much of their time in Colorado. The fact that horses don't

live within the boundaries of areas they are managed for has significant implications. The BLM currently uses aerial surveys to count horses within each Herd Management Area and estimate the amount of forage consumed by horses, which subsequently affects the number of livestock permitted in the area. Our GPS data provides more in-depth information on year-round horse use than aerial counts and could be used to more accurately estimate forage consumed. As our project advances, we aim to provide the BLM and other stakeholders with even richer information, such as maps depicting the probability of seasonal horse use across the study area, as well as information on how horse, pronghorn, and sage-grouse habitat overlaps in this desolate, yet beautiful landscape.

Jacob D. Hennig is a PhD student working with professors J. Derek Scasta and Jeffrey L. Beck in the Department of Ecosystem Science and Management at the University of Wyoming.

One Steppe

New tools to improve management of Wyoming's sagebrush ecosystem

By Michael Curran with consultation from Nicholas Graf, Jana White, Amanda Withroder, and Peter Stahl

In November 2014 the Douglas Core Area Restoration Team was all set to plant 16,000 sagebrush seedlings in a wildfire burn area east of Douglas, Wyoming. But as trucks carrying the seedlings from the commercial grower approached Wyoming, the temperature dropped. When the trucks arrived, it was -20° F, conditions that would have certainly killed most tiny seedlings. Instead of planting the seedlings, the team scrambled to find greenhouses to overwinter the plants. Replanting the burned area was just one aspect of a larger sagebrush habitat restoration effort organized by the Douglas Core Area Restoration Team. The team based the restoration plan on an extensive data set, which they had to compile from monitoring and collaboration with energy operators, private landowners, wildlife managers, and other entities with a stake in this landscape. All that data management and planning could have been much more streamlined if information about this landscape were organized into one location and the team had access to more effective planning tools.

Uses of Wyoming's wide open lands include livestock grazing, natural resource production, recreation, and wildlife habitat among others. Balancing economic development and conservation requires lots of reliable, well-organized information about the landscape. That's why researchers at UW are developing a web application that will collect and catalog information related to landscape disturbance, restoration efforts, and other conservation work to help improve land management decisions

in Wyoming. The goal is to tell the story of Wyoming's whole sagebrush steppe ecosystem, both public and private lands, in one place so that anyone—ranchers, developers, land managers, state and federal agency workers, conservationists, wildlife biologists, and others—can see in near real-time what is and isn't working to improve the sagebrush ecosystem and benefit the species that depend on it.



This effort started in 2008, when Wyoming's leaders feared that a potential endangered species listing for the greater sage-grouse would curtail natural resource production and agriculture. To protect sage-grouse and fend off those concerns, Governor Dave Freudenthal signed Wyoming's first Sage-Grouse Executive Order. The order designated "core areas" or key habitats throughout the state where avoiding or minimizing disturbance would protect a large number of greater sage-grouse. One of these, the Douglas Core Area, became a focus of deliberate, coordinated management activities and received perhaps the most attention of all Wyoming core areas, including efforts to compile and apply extensive overlapping data sets in a meaningful way.

The Douglas Core Area spans 66,813 acres of federal, private, and state land. Like much of northeastern Wyoming, some sagebrush within the core area has been converted to crops or grassland for livestock grazing and much of it has burned in several large wildfires. This place has become ground zero in Wyoming for managing ecological restoration and species conservation in the midst of oil and natural gas development. Oil and gas operators hold developable lease



Members of the Douglas Core Area Restoration Team plant sagebrush seedlings.

rights pre-dating the Sage-Grouse Executive Order, so managers here must plan for new disturbance in such a way that will not exceed allowed disturbance thresholds.

To do this, the Douglas Core Area Restoration Team, led by industry and including members from federal and state agencies, non-governmental organizations, environmental consultants, and academia, needed data and decision-making tools. They turned to the Density Disturbance Calculation Tool, which the University of Wyoming Geographic Information Science Center built at the state's behest in response to the Sage-Grouse Executive Order. The tool holds an extensive inventory of land disturbance, and planners use it to vet future activities in core areas with a goal of minimizing the overall disturbance footprint. But it doesn't hold information about

everything in the Douglas Core Area, and the team had to track down information from other sources and even collect their own data to develop the restoration plan.



The Douglas Core Area serves as a microcosm of Wyoming's larger land management challenges. Throughout the state, managers seek the best strategies to protect wildlife habitat, monitor restoration areas, maintain sustainable grazing and agricultural production, and produce resources such as oil, gas, coal, bentonite, uranium, trona, and wind energy. Since Wyoming is almost evenly split between public and private lands, planning also requires cooperation between government agencies and private land owners.

In addition to the Density Disturbance Calculation Tool, several

other databases influence planning for Wyoming's sagebrush steppe ecosystem. For example, in 2015 the Density Disturbance Calculation Tool was integrated with another tool from UW, the Wyoming Reclamation and Restoration Database, which tracks oil and gas development reclamation efforts. The resulting Surface Mapping and Restoration Tracking (SMART) tool combines data from the Density Disturbance Calculation Tool and Wyoming Reclamation and Restoration Database along with Game and Fish spatial data about sage-grouse populations to determine where mitigation could help the birds. Yet another system, Wyoming's Conservation Efforts Database, tracks disturbance, reclamation, and other conservation efforts using data from other tools as well as from private landowners, consulting firms, various state government agencies, and the energy industry.

In addition, federal agencies have multiple databases and tools of their own. In some instances, natural resource extraction companies are expected to report to four or more data systems, many of which contain overlapping data. Aside from being cumbersome for an operator to learn to use so many tools, the redundancy wastes time and money. Further, resource managers trying to make planning decisions must query several systems to get answers. In many instances, extraction companies, government agencies, and other entities all store data separately. At the same time, other parties with an interest in the sagebrush steppe ecosystem—such as ranchers improving wildlife habitat on their property—have limited options to report or get credit for their good deeds. Integrating the many existing tools into a single portal would lead to obvious improvements for many parties.

To address this challenge, the Wyoming Game and Fish Department, Wyoming Wildlife and Natural Resource Trust, US Forest Service, Bureau of Land Management, and Petroleum Association of Wyoming funded the Wyoming Geographic Information Science Center and

Wyoming Reclamation and Restoration Center at UW starting in 2015 to develop a single web application to integrate these tools and more. This central data system, called One Steppe, will collect data, improve land management decisions, and provide agencies, operators, and landowners with more useful and accessible information. Once operational, it will be a portal to existing tools like the DDCT and the SMART tools, and it will aim to feed data into the many other government-required reporting systems to reduce redundancy.

Although conservation efforts throughout Wyoming and the western US have recently focused on sage-grouse and the core areas, One Steppe will shift its focus to the entire sagebrush steppe ecosystem, collecting and housing all sorts of data about roads and structures, wildfire burns, vegetation species and coverage, soil types, reclaimed areas, conservation areas, and more. It will be a place for everyone from energy companies to private landowners to grazing leaseholders and others to report their actions on the landscape and organize monitoring data. The system is meant to be transparent while protecting proprietary information, so different users will have restricted access to query and export different views of the data. And it will be updated constantly so that as reporting needs change—say a new species in the

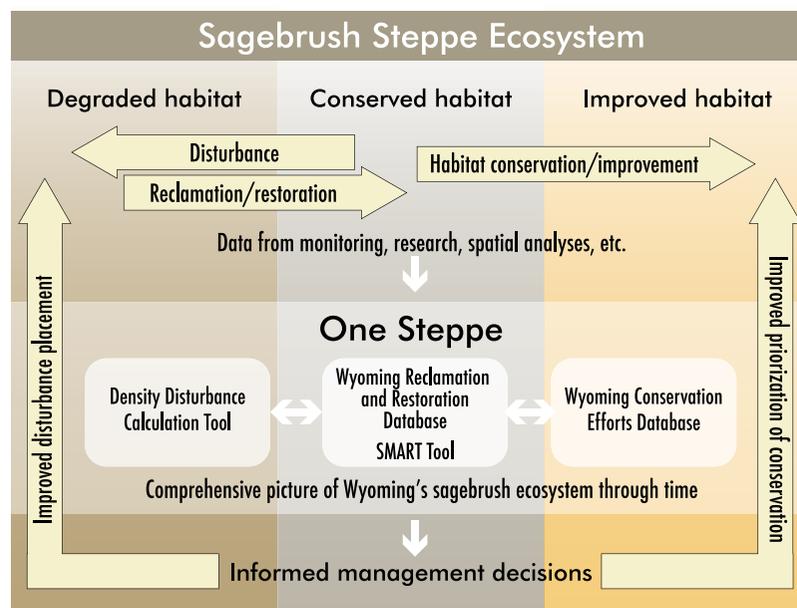
sagebrush ecosystem is petitioned for an endangered species listing and Wyoming creates a conservation plan and wants to show where that species can find suitable habitat—One Steppe will have the answers.

Streamlining all these tools into one central web application will allow near real-time updates; better data tracking when staffers turn over within agencies; reporting entities to see their own data; and better understanding of trends related to disturbance, restoration activities, and conservation efforts. All of this will ultimately lead to improvements in wildlife habitat. One Steppe will help Wyoming transparently and accurately assess its successes and failures in land use and conservation. Finally, many benefits come from having this system stored at UW, which serves as a neutral party with objective goals. Researchers and other stakeholders will be able to analyze data within One Steppe to improve best management practices, look for correlations between disturbance types and species' behaviors and trends, or access other meaningful findings.

Meanwhile, restoration and monitoring continue in the Douglas Core Area. After overwintering the 16,000 sagebrush plants, the Douglas Core Area Restoration Team members planted them in the burn area the following spring. A UW master's student compared

success rates of sagebrush seedlings planted with different methods and at different densities to improve future management practices. In the past, data from studies like these would likely vanish into a thesis or the peer-reviewed literature, but these data are integral to the Douglas Core Area Restoration Team's effort to measure the success of habitat restoration efforts, reclassify previously burned or disturbed areas in the future, and ultimately to reduce the overall disturbance within the core area.

When One Steppe comes on board, its web platform will accept the data and allow easy access by resource managers who may benefit from seeing the results. Improving data management and access could save time and money for entities that need that data, allowing them to direct more resources to on-the-ground conservation. It could incentivize ranchers to do more conservation since they'll have a place to report their efforts and be recognized for their good work. And it could mean that when the next declining species in Wyoming's sagebrush steppe ecosystem is petitioned for an endangered listing, managers can quickly map key habitats and create a meaningful protection strategy. If all goes as planned, such actions will actually improve the health and quality of the sagebrush steppe ecosystem throughout Wyoming amidst ongoing development.



One Steppe will accept a wide range of data and feed it into existing tools to create a comprehensive picture of Wyoming's sagebrush steppe ecosystem through time.

Michael Curran is a PhD student in the Program in Ecology and Department of Ecosystem Science and Management at the University of Wyoming as well as data steward for the Wyoming Reclamation and Restoration Center Database. **Nicholas Graf** is a research scientist and the DDCT data and application steward at the Wyoming Geographic Information Science Center. **Amanda Withroder** is a staff biologist with the Habitat Protection Program at the Wyoming Game and Fish Department. **Jana White** is a senior ecologist who supports the Douglas Core Area Restoration Team as a consultant for Trihydro Corporation. **Peter Stahl** is professor of soil science and directs the Wyoming Reclamation and Restoration Center at the University of Wyoming.

News and Happenings from the Ruckelshaus Institute



(L to R) Retired Wyoming Supreme Court Justice Marilyn Kite moderates a panel discussion about “Civility: The Case for Collaboration” featuring Governor Michael Sullivan, Chairman John Turner, and Senator Alan Simpson at the Haub School and Ruckelshaus Institute’s 25th anniversary celebration on the University of Wyoming campus in August.

CELEBRATING 25 YEARS

In 1993 a group of visionary leaders at the University of Wyoming created a School and Institute of Environment and Natural Resources to use collaborative approaches to solve difficult challenges. The school would offer students from any disciplinary field on campus a concurrent major or minor studying environmental problem solving from an interdisciplinary perspective. The institute would convene stakeholders to build robust, collaborative solutions to environmental and natural resource challenges. It would be a place where environmentalists, ranchers, land management agency representatives, energy industry representatives, and others could sit down together and negotiate solutions to not only meet each of their needs, but also provide real gains while averting the alternate outcome of expensive and time-consuming litigation.

Over the following decades this program grew in prestige, accomplishments, and size. In 2002, the institute was named for founding chairman William D. Ruckelshaus, a former Environmental Protection Agency administrator who espoused collaboration to address environmental and natural resource issues. In 2004 Helga and Erivan Haub, conservation-minded business people from Germany, gifted a \$3 million endowment to the school, which was subsequently named in Helga’s honor.



This year marks a quarter century since the institute and school were first approved by the UW Board of Trustees. In those 25 years, over 500 undergraduate and graduate students have earned degrees from UW with a major or minor in environment and natural resources, sustainability, outdoor leadership, or environmental systems science, which make up the school’s suite of academic offerings.

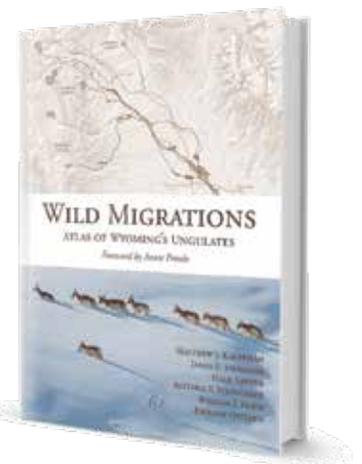
This summer we convened an event to celebrate our 25th anniversary. Hundreds of alumni, past board and staff members, and friends of the Haub School joined us at the Gateway Center on the UW campus for a celebratory luncheon, oral history documentation, and an evening panel discussion. Liliane Haub introduced the evening event, which featured Senator Alan Simpson, Governor Michael Sullivan, and Haub School Board Chairman John Turner speaking on the topic of “Civility: The Case for Collaboration.” Retired Wyoming Supreme Court Chief Justice Marilyn Kite moderated the discussion. See video of the event on the Haub School website, uwyo.edu/haub.

The celebration was an opportunity to reflect on the progress the school and institute have made toward addressing environment and natural resource challenges over the past years as well as the critical need for this work going forward. We look forward to the Haub School and Ruckelshaus Institute’s next 25 years.

WILD MIGRATIONS BOOK PUBLISHED

The Ruckelshaus Institute’s *Western Confluence* editor Emilene Ostlind co-authored a book titled *Wild Migrations: Atlas of Wyoming’s Ungulates*. An effort of the Wyoming Migration Initiative, the atlas tells the story of the long-distance migrations that elk, mule deer, moose, pronghorn, bighorn sheep, bison, and mountain goats make each spring and fall across the landscapes of the American West. The book is the definitive synthesis of these epic journeys as seen through the eyes of the biologists and wildlife managers who have studied the ungulates, or hoofed mammals, of Wyoming.

Each spread in the book investigates an ecological, historical, or conservation aspect of migration through clear and compelling maps, graphics, and photos. The atlas tells the nuanced story of wildlife migration, the scientists who study it, and the conservationists who are working to keep wild migrations flowing across western landscapes.



Learn more about the publication at migrationinitiative.org/wild-migrations-atlas.

THANK YOU TO OUR GENEROUS SUPPORTERS

Supporters and readers who believe in our mission to advance conversations about, and understanding of, complex environment and natural resource issues in the West pay for *Western Confluence* magazine. Each issue costs about \$25,000 to write, design, and distribute. Private gifts cover all of these expenses. Special thanks for this issue go to Dick and Mary Lou Taggart, Liliane and Christian Haub, Gilman and Margaret Ordway, and the Walton Family Foundation.

Following our issue on endangered species last winter, we sent out a letter to our readers asking for contributions and offering a *Western Confluence* t-shirt to those who gave \$150 or more. The response was overwhelming. In just a few months, we received over 65 gifts totaling nearly \$10,000. Your support demonstrates that readers really do value the clear, unbiased, in-depth storytelling this magazine provides. Thank you so much to everyone who gave to *Western Confluence* this year.

Rollin and Carolyn Abernethy
Lenox and Fran Baker
Scott Beal
Christopher Beltz
Drew and Carrie Bennett
Harold Bergman
Kevin Bertagnolli
Gail Bingham
Freddie and Amanda Botur
Marjorie Brooks
Mary Burman
Courtney Carlson
Mary Rose Cassa
Gregg Cawley
Louisa Crosby
Elizabeth Davy
Charlie DeWolf
Nickolas Dobric
Sara Domek
Deb Donahue

Ellen Dudley
Steve Dudley
Fred and Keren Emerich
John and Leslie Farr
Tyson Finnicum
Victor Flach
Dona Fleming
Dwayne C. and Josephine Garner
Jeff Hamerlinck
Laramie Rivers Conservation District
Liliane and Christian Haub
Catherine Healy
Carol Hennessy
Edith Heyward
Julie and Rodney Johnson
George Jones
Charles Kirkham, Jr.
Robert Kohut
Gail Kohanek
Amanda Korpitz

Kenneth Lay
James Lovvorn
Judith McBride
Jocelyn Moore
Maureen Morrison
Linda and Reid Murchison
Kenneth and Carol Nysson
Kim and Kurt Olson
Debra Ormsbee
Wendy and Joel Ostlind
Margaret Page
Stacy Page
Ben and Lynette Parkhurst
Ann Parsekian
Louise Plank
Alfred Pogge
Sandru Ranch
Clem Rawlins
Ruby Quarterman
Charlie Reinertsen

Kayce Reinertsen
Merrill and Sharon Sanders
Roger Sanders
Dan Schlager
Jon Siddoway
Albert and Sue Sommers
Jason Spaeth
Jeff and Sandra Streeter
James and Kathleen Stickland
Mike and Jane Sullivan
Dick and Mary Taggart
Margie Taylor
Kyle Trumble
Betsy Wagner
Michael Whitfield
Julia Whyde and Frank Korfanta
Dominic and Theresa Winslow
Paige Williams
Connie Wilbert

Support science storytelling and informed natural resource management decisions



Help us share stories of critical natural resource research findings with citizens and decision makers nationwide. We need your support. Your contribution will underwrite thoughtful and compelling articles to inform natural resource management.

Yes, I'll support rigorous science reporting to inform sound natural resource management.

My gift to *Western Confluence* magazine:

\$100 \$250 \$500 \$1,000 Other _____

Name(s): _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Email: _____

GIVING IS EASY

Cut out this form and send it with your contribution in the mail:

University of Wyoming Foundation
222 S 22nd St
Laramie, WY 82070

Or call the UW Foundation at (888) 831-7795 or click the donate button at westernconfluence.org.

Please specify that your gift supports *Western Confluence* magazine and reference giving code P19WC.

Your gift is tax deductible as provided by law. Thank you for your support.





Rebel YELL

Why the Sagebrush Rebellion didn't end with Malheur

Perspective from R. McGregor Cawley, illustration by Yeshe Parks

The Court excludes Dr. Cawley's testimony as irrelevant and finds, in any event, that its probative value is significantly outweighed by the risk of confusing the issues, misleading the jury, and wasting time." Here's the backstory.

In January 2016, a group of disgruntled federal-land users and militia activists occupied the Malheur Wildlife Refuge in Oregon as a way to challenge the authority of the federal government. After a more than month-long standoff, the occupiers surrendered to federal authorities. In June 2016, I was contacted by the court-appointed lawyer for one of the occupiers about the possibility of serving as an expert witness for the defense.

A central question in the trial was whether the occupation represented a criminal act (the government's position) or a political protest (the defendants' position). I was contacted because 25 years ago, I published a book on a federal-land controversy dubbed the "Sagebrush Rebellion." The expressed goal of the movement was to get federal lands—primarily those managed by the Bureau of Land Management—transferred to the western states. A central contention of my book, however, was that the call for land transfer was a red herring. It was actually a vehicle for ranchers and other users to articulate their belief that they

were being excluded from the federal land-use decision process. In my view, then, the Sagebrush Rebellion was in fact a political protest.

I agreed to provide testimony that would situate the occupation against the background of the Sagebrush Rebellion and federal-land political disputes more generally. But first I would have to pass an audition ("Daubert hearing" in legal jargon) with the trial judge. As the judge's response above indicates, I failed the audition. Interestingly enough, the jury subsequently acquitted the defendants on grounds along the lines of the testimony I would have given.

An interesting consequence of being identified as an expert about the Sagebrush Rebellion has been a stream of interviews with journalists over the years. Every time some federal-land conflict emerges, my phone starts ringing as journalists want to know if I view the said incident as the "new Sagebrush Rebellion." Many of the journalists are rather disappointed with my explanation that these controversies are not "new Sagebrush Rebellions" but rather a continuation of the original movement.

At the time my book was published the dominant view was that the Sagebrush Rebellion ended when the movement failed to transfer public lands to the states. I saw a different possibility. While the Sagebrush Rebellion as a more or less formal

movement might have ended, the issues raised by it were far from being settled. Herein is an important lesson about political controversies in our governing system. They seldom have definitive end points because the "losers" in an argument at one point in time are usually not executed or exiled. As long as people believe they have valid complaints, they will continue to press their issues. This lesson certainly applies to federal-land controversies.

What we now call "Sagebrush Rebels" are people who have been pursuing a more or less consistent political agenda since at least the 1950s. One of their key issues is opposition to management that emphasizes preservation over development goals. Another, and equally important, issue is a desire for more state or local government authority in the federal-land-management decision process. Since neither of these issues can be resolved once and for all, they are best understood as venues for ongoing arguments. Indeed, the passage of the Federal Land Management and Policy Act in 1976 was portrayed as defining a compromise that would resolve federal-land policy disputes. Yet, roughly three years later the Sagebrush Rebellion spread across the western states.

This brings us back to my brief adventure in the Malheur occupation trial. My comments here are essentially a truncated version of the testimony I presented before the judge. Although

her comment may seem harsh, I don't really disagree with her assessment. In my 30-plus years studying and writing about political controversies, I have yet to find one that doesn't have confusing and misleading aspects if taken seriously. My view of these matters might be "irrelevant" from a strictly legal perspective, but it captures the essence of politics as it plays out in the real world.

Many federal-land observers contend that the acquittal of the occupiers was a travesty of justice. Maybe so, but I propose another view. On the one hand, it was a curiously positive development. Not because it means the occupiers' position was vindicated, but rather because it makes it more difficult for them to sustain an image of being "victims" of a heavy-handed government. As such, it makes more protests less likely, at least for the time being. On the other hand, it didn't resolve any of the issues that led the people to occupy the refuge. So, I remain committed to the position I presented in my book 25 years ago: the movement may have ended, but the Sagebrush Rebels are still very much alive and can be expected to continue pursuing their agenda.

R. McGregor Cawley is a professor of political science at the University of Wyoming, and author of *Federal Land, Western Anger: The Sagebrush Rebellion and Environmental Politics*.

Ruckelshaus Institute
Haub School of ENR
1000 E University Ave, Dept 3971
Laramie, WY 82071

