



*The Secret Lives of Elk*

# Uncovering One of America's Great Migrations

*story by Nicky Ouellet*

*photos by Joe Riis*

*The elk we hunters chase come fall have sometimes taken an epic journey to reach the places we find them. A trailblazing project in Wyoming aims not only to quantify and map one of the world's great elk migrations, but to give the public an unprecedented seat into a blockbuster natural drama.*





**MUGSHOTS OF MIGRATION—** Photographer Joe Riis employed a trapline of strategically placed cameras to capture dramatic snapshots of some of the 6,500 elk that migrate between the alpine plateaus of Wyoming's Thorofare and winter ranges northwest of Cody. Riis teamed with biologist Arthur Middleton, documentary filmmaker Jenny Nichols and artist James Prosek on a two-year venture to track the migrations of the Cody elk herd. The team used camera traps, cutting-edge maps painted with dots from thousands of GPS locations of collared elk, and movie cameras to document the epic migrations that elk make through the Greater Yellowstone Ecosystem.

The ridgeline leading to the pass over Needle Mountain is just wide enough for Arthur Middleton and his dog Jack to walk side by side. At nearly 12,000 feet, each step requires careful placement. The ridge is a mix of scree and caked mud, and up ahead, a snowfield, blinding in the midday June sun, clings impossibly to the sheer side of the peak.

Other areas in Wyoming's Absaroka Range are renowned for long pack trips—after all, this is some of the remotest country still intact in the lower 48. Trophy mule deer and elk abound throughout the range, and the Yellowstone, Shoshone, Wind and Boulder rivers that originate here are famous for their blue ribbon trout fishing. But even seasoned guides hesitate to risk a pack train on Needle Mountain.

Middleton's boots crunch over crusted mud that still bears imprints of elk hooves. The tracks, formed by hundreds of elk from the Cody herd, represent a relentless trudge over the ridge and across the snowfield to crest Needle Mountain before a sharp descent down the peak's western flank.

Middleton and his trekking partners, wildlife photographer Joe Riis (pronounced reese) and filmmaker Jenny Nichols, are at the dramatic climax of a two-year venture to track the migrations of the Cody elk herd. The team uses photos, maps created using data points from GIS collars and film to capture the epic transboundary migrations elk make through the vast Greater Yellowstone Ecosystem (GYE), which encompasses 12 to 26 million acres, depending on how you draw the boundaries.

"We really don't want to cross there," Middleton said, turning to face Nichols' camera. "A lot of people think elk are just elk, and then the elk go and do *that*... so maybe a wildlife biologist *can* do it."

Most of the 6,500 elk in the Cody herd make this passage across Needle Mountain's snowfields twice a year as they migrate between summer and winter range, a trek that can range from 30 to 90 miles one-way. Some fleet-footed elk do it in as little as a few days. For cows that give birth along the way it can take up to a month. Compared to other ungulate migrations, it's a short trip. Pronghorn and mule deer have recently been documented migrating 120 and 150 miles respectively, and caribou can travel up to 1,500 miles one way. But whatever the elk migration lacks in distance, it makes up for in grit. Elk cross mountains, ford rivers and brave alpine blizzards all while shepherding young calves and staving off wolves and grizzly bears. The journeys are so remote that many outfitters don't even know the specifics, but knowledge and protection of these routes is vital to ensure the legendary elk herds that sustain their livelihoods remain healthy.

"There's no animal in Yellowstone that we think we know more about than elk," Middleton said a few months after returning from the field. "But we still tend to overlook this hidden part of their biology, this missing piece: what actually goes on during



their migrations.”

The elk migrations of the GYE present the last frontier of our understanding of ungulate movement. Teams like Middleton’s and the Wyoming Migration Initiative—a collective of researchers, cartographers, students and writers who since 2012 have focused on cataloging Wyoming’s ungulate migrations—provide cutting-edge insight into the lives and movements of elk through the landscape and the consequences of interrupting that movement. With a full elk migration assessment forthcoming, their trailblazing research has already begun to influence land management decisions and reshape how stakeholders approach conservation across borders.

### *The Study*

Middleton and Riis embarked on the project as partners with clear roles: Middleton would tackle the science of migration and Riis would document it through photography. Together they would reach a broader audience than either could on his own.

“I felt from an early stage that this story is too important to be left only to research,” Middleton said.

Middleton analyzed existing GPS collaring data gathered by universities, state agencies, the U.S. Fish and Wildlife Service and the National Park Service from hundreds of elk in nine migratory herds in the Greater Yellowstone. He filled in gaps by collaring an additional 30 individuals from the Cody herd and another 15 from the Wiggins Fork herd. He was curious about their movements across land ownership boundaries, how climate affects their migration and the potential for camera trapping as a successful way to monitor the migration long term.

“You really have to understand that migration in order to understand what’s going on with some of these elk herds, particular in the GYE,” Middleton said.

For two years, Middleton and Riis chased the Cody herd over mountains and across rivers through every imaginable weather to fill in the gaps in elk migration maps. *National Geographic* named the pair Adventurers of the Year in 2016 for their joint effort, dubbing them “wildlife heroes.”

Middleton had partnered with Riis—best known for being the first to photograph an entire pronghorn migration, and doing it all on foot—in Argentina while studying puma predation. They worked well together and decided to team up for a longer study on elk migrations. Raised in South Carolina, Middleton had never seen an elk until he came to Wyoming to begin his post-doctoral research for Yale, studying wolf-elk interactions in the Absaroka Range. After a summer working in the field in Wyoming and welcoming the birth of his new son, he will begin teaching at the University of California, Berkeley this fall. He is keenly interested in how wildlife and habitat are managed across the mixture of public and private lands in the West.



**FULL FLOOD**—The Cody herd begins migrating in late spring from a lowland landscape freckled with sagebrush and well pads to alpine basins overflowing with snowmelt and grizzlies. Many cow elk are pregnant or shepherding young calves along this route, and after they crest the high point of their journey, 12,000-foot Needle Mountain, they face a near vertical drop to the banks of the South Fork of the Shoshone River at peak runoff. After a few deep breaths, elk plunge into the icy waters, sometimes getting swept hundreds of yards downstream before hopefully emerging on the western bank. From there they scale another 11,000-foot pass before finally arriving at the Thorofare, the most remote backcountry in the Lower 48 and home to one of America’s wildest elk hunts.





Filmmaker Jenny Nichols and Arthur Middleton's dog Jack on the path of migrating elk in Wyoming.

## Elk Pour onto the Big Screen

Crouched behind a thin scrap of burlap, Jenny Nichols sat in wonder. She was 10 miles from the nearest road, poised to capture a crux moment of the Cody herd's migration: crossing the South Fork of the Shoshone River at the peak of spring runoff.

"I'm totally in awe of them now," she said.

Nichols has spent the past decade working on projects that tell the behind-the-scenes stories of conservation. In 2015, she joined Joe Riis and Arthur Middleton in the field to capture the extreme nature of their work. This grew into *Elk River*, a 30-minute film that debuted at the Telluride Mountainfilm Festival in late May.

Shot mostly on equipment she could haul on her back or on horseback, *Elk River* follows Riis and Middleton as they navigate the Cody herd's migration path and piece together elk's role in the Greater Yellowstone Ecosystem.

"The film is a mix of conservation and sport and adventure," she said. "It's making conservation cool."

Land use in the greater Yellowstone has long been a polarizing issue, with ranchers, energy developers, tourists, hunters, and state and federal land and wildlife managers sometimes at odds. In elk, Nichols sees a rare common ground. People are connected by and depend on elk, she says, and elk in turn rely on cooperation across public and private landscapes to keep their migration corridors intact.

Whether from watching her film, seeing Riis's photographs or James Prosek's paintings or reading Middleton's science, her goal is to focus attention on the unique and vital landscapes where these seasonal rivers of elk and other wildlife flow, and to inspire people to work together to protect them.

"The biggest goal collectively is to reach as many people as possible and redefine how people look at Yellowstone and elk," she said. "To help people see how interconnected everything is."

—Nicky Ouellet, Bugle Intern

For a preview of *Elk River* visit [www.vimeo.com/162996467](http://www.vimeo.com/162996467) or check [www.greateryellowstonemigrations.com](http://www.greateryellowstonemigrations.com) for upcoming screenings of the full film.

Middleton credits Doug McWhirter, Wyoming Game and Fish biologist for the Cody area, as the catalyst for the entire study. McWhirter began studying the productivity of the Cody and Clarks Fork herds in 2007 and started using trail cameras to survey elk. He found in a few sites he could capture images of up to 4,000 elk in a single season.

"Doug showed us some of the images and we were amazed and inspired to start thinking bigger about what we could do," Middleton said.

With McWhirter's guidance in the field, Middleton came to see elk as a keystone species of the landscape and expanded the focus of his study to become the project it is today.

"Elk were always just a character in some story about something else," he said, a species relegated to play second fiddle to more charismatic carnivores. He wrapped up his predator-prey studies and set out to make elk the stars of their own stories.

Riis, on the other hand, grew up hunting elk. Born and raised in South Dakota, he got his degree in wildlife biology from the University of Wyoming, then turned to photography as a way to be outside while helping connect people with wildlife. He made his breakthrough in 2009 shooting what came to be known as the Path of the Pronghorn, the 120-mile antelope migration through Wyoming's Gros Ventre Range, and later apprenticed under Steve Winter, a wildlife photographer best known for his use of camera traps to photograph big cats in Asia. A camera trap is essentially the same thing as the trail cameras many hunters use, but houses a professional-grade DSLR camera with a wide-angle lens.

"Camera traps are just a tool to make it look like you're sitting right there on the trail and help people connect with both the landscape and the animal in one frame," Riis said.

Taking photos using camera traps quickly became his signature technique. Back in the States, he partnered with Hall Sawyer, the research biologist who documented the 150-mile mule deer migration corridor from Red Desert to Hoback Mountain. It's the longest land animal migration in the Lower 48, crossing from Wyoming's low desert through a patchwork of private and public lands to the high mountains. Until Sawyer's study, the Red Desert herd was generally considered sedentary. Riis's photos brought the migration out of the wild and onto television screens, pages of magazines and museum halls. When Middleton suggested doing the same for elk, Riis accepted the challenge.

"I didn't think of photographing elk for a long time," he said. "I didn't quite know if it was possible to get pictures of elk in long lines, and I also didn't know what kind of migrations they went on.

"To be honest with you, I thought it would be kind of boring," he added. Riis would later recant that idea after chasing the Cody herd's migration route over

Needle Mountain and across the Shoshone River.

In 2013 the pair received the first Camp Monaco Prize, a \$100,000 grant to support scientific research and the understanding of biodiversity in the Greater Yellowstone Ecosystem—in this case to document the movements of migratory elk. They hired brothers Lee and Wes Livingston of Livingston Outfitting out of Cody as guides and brought documentary filmmaker Jenny Nichols and artist James Prosek on board to broaden the project's outreach. For two years, the team spent weeks at a time following the elk's path.

Elk in the Cody herd begin their migration in late spring, leaving their winter range northwest of Cody on a mixture of Bureau of Land Management, state land and big working ranches, some of it freckled with gas and oil well pads. Many of the cows are pregnant or shepherding young calves by the time they crest Boulder Pass at 10,000 feet, post-holing through the snowpack. Grizzlies and wolves trail them through valleys on the way to a second pass at Needle Mountain ("that's the absolute ass-kicker," said Middleton) before they drop 5,000 feet over the course of a mile to reach the banks of the South Fork of the Shoshone River at peak runoff. Here they ford the river, sometimes getting swept hundreds of yards downstream before emerging on the western bank. From there, they traverse another 11,000-foot mountain pass similar to Needle Mountain before finally arriving at the remote alpine plateaus of the Thorofare.

"The act of trying to follow where they go, that is

what's been staggering," said Riis. "For these elk in the Cody herd, the elevation gain and loss over the course of a few days is beyond humanly possible. Seeing where they go and where they climb, the amount of bears on the trail, that's what kind of blew my mind."

Middleton spent long weeks collaring elk and poring over GPS information to flesh out the maps, but still managed to join Riis about half the time he was in the field. Riis spent the entirety of the first year following elk tracks in snow and mud as against a computer screen, riding horseback to scout out locations for his camera traps.

"There's no scientific method to my work," he said. "My camera locations are not studying the numbers." Instead, Riis looks for dramatic or unexpected backdrops—a cliff face, a chokepoint, a river crossing—to show the epic nature of the terrain through which elk migrate.

Now back from the field, scientist, photographer, filmmaker and artist are combining their disciplines to connect with a broader audience than any could reach on their own. They've created a traveling museum exhibition that combines science and the arts to consider wildlife migrations in the GYE. "Invisible Boundaries: Exploring Yellowstone's Great Animal Migrations," showcases Riis' wall-sized prints, Prosek's original paintings and maps based on Middleton's migration survey. Nichols' film, *Elk River*, debuted at the Telluride Mountainfilm Festival in May. Riis and Middleton's passage across the Needle Mountain



**WEB ANALYTICS** — Researchers used helicopters and local hunting outfitters that moonlight as wildlife net-gunners to capture 30 elk from the Cody herd and another 15 from the Wiggins Fork herd so they could be fitted with GPS tracking collars. The devices immediately began streaming data-points, revealing the timeworn paths elk depend on during migration.



**SAGE GUIDES**—“I can think of nothing better to do than go spend a month up here by yourself,” says Wes Livingston (center), who helped Arthur Middleton (left) and his crew pack into the high country to track, film and photograph migrating elk. Wes and his brother Lee (right), both RMEF members, run Livingston Outfitting out of Cody, packing hunters and campers from as soon as the snow starts to melt until the country drifts shut for winter. “For many years, Wes and I would be the first ones over the mountain into the Thorofare,” Lee says. “It was a big adventure. I love to go see the elk in the spring, then we follow them through the summer when we take our pack trips. Then into the fall, through the hunting season, we rely on the elk. In the wintertime, we go net-gun out of helicopters for this research project. So it’s pretty much year-round that we’re interacting with these elk.”



snowfield lends an air of adventure to the behind-the-scenes footage of their study (see “Elk Pour onto the Big Screen,” page 110).

They’ve also partnered with the Wyoming Migration Initiative (WMI). Their goal, said director and co-founder Matthew Kauffman, is to create tools wildlife and land managers can use to make more informed decisions about stewardship.

“The idea was fairly simple,” Kauffman said. “We recognize that there’s lots of groups interested in conserving migration, and if we just changed slightly how we did our research and communicated our science, we could help those groups better incorporate that science into on-the-ground conservation and management.”

Middleton and Riis’s project is part of WMI’s second migration assessment. Their first focused on the Red Desert to Hoback mule deer migration and revealed that mule deer migrate farther than anyone expected, underscoring the critical nature of keeping their migration corridors intact.

The Elk Migrations of the Greater Yellowstone project, funded in part by the Rocky Mountain Elk Foundation, incorporates Middleton’s collaring study with existing agency and university data to create maps and reports that depict critical migration corridors and highlight vital and vulnerable areas along the way. Until now, studies tended to focus on one herd at a time, leaving managers’ understanding of elk movements piecemeal and without the context or points for comparison. The assessment aimed to bring it all together.

This landscape-level approach revealed the shape of nine migrations—Middleton described it as an “orderly octopus with nine arms sitting on Yellowstone”—as well as their relative timing. For Middleton, seeing the maps drove home the idea that the fate of Yellowstone’s ungulate populations hinges on migrations that cross the boundaries of public and private land managed for a huge variety of uses. Mule deer, bison, pronghorn, bighorn and moose migrate across this landscape, but elk are the heart of it all. Their seasonal movements following spring green-up and winter’s onset sustain predators and hunters along the way, and in large measure drive the entire system.

“After eight years studying elk in Greater Yellowstone, I’ve started to feel for the first time I’ve got a thread to follow into that complex system to start understanding it,” Middleton said.

While Middleton will spend the next several years pursuing that thread, Kauffman’s team at WMI will map stopovers, road crossings and bottlenecks of elk migrations in the GYE as the group did with the Red Desert to Hoback mule deer assessment. Some differences between the two species’ migrations are becoming clear. For example, elk migration paths tend to diverge more than those of deer. Where deer will travel 120 miles using the same two-mile wide corridor,



elk fan out as soon as they leave winter range and hit fresh greens.

Kauffman also noticed that when it comes to migration, elk in the GYE fall into two groups. Elk that rely on alfalfa pellets at the National Elk Refuge and the state of Wyoming's 23 feedgrounds migrate just like their unfed cousins, but the feedground-

dependent elk seem to be more sensitive to snow and cold temperatures. They migrate out of the mountains sooner, spending up to a full month less there than elk that winter on native range.

"The feedgrounds have changed the way those elk interact with their habitat and environment," Kauffman said. Successful management relies on elk

moving up into the mountains to limit interactions with cattle and agriculture and benefit from emergence of green forage in the high country. "And ironically the feedground program has made it [so they spend] less time up in the mountains," he added.

Findings like these, where filling a small gap in knowledge can lead to a leap in healthy herd

management, are the point of WMI's migration research. Kauffman hopes to follow the elk assessment with similar projects targeting bighorn sheep and moose around Jackson Hole.

Ultimately, the migration routes of all these species, along with maps showing sensitive areas like highway crossings, stopover points and habitat

## Putting the Wonder in the Wonk

On the earliest printed maps, cartographers might embellish their work with a dragon or two on the margins to pull in their viewer. Jim Meacham and his team at the University of Oregon's InfoGraphics don't employ too many dragons these days, but their challenge is the same: taking a set of scientific information and giving it a heartbeat. In this case, that information is a mountain of geographic data points, lines, polygons and rates of travel compiled by the Wyoming Migration Initiative (WMI) from ungulates carrying GPS collars across the wildlands of Wyoming. Meacham and his crew work to bring the epic migrations of elk, pronghorns, mule deer and other ungulates to life using maps, charts, photographs and narrative.

"At the heart of the project is having an impact on helping to conserve these routes," Meacham said.

Due out in 2018, the *Atlas of Wildlife Migration: Wyoming's Ungulates*, a 200-page, large-format book will be the first of its kind dedicated to telling the story of ungulate migration. The book's goal is to make scientific research on Wyoming's big game migrations accessible to a wider audience, with

maps intertwining with vivid photographs by wildlife photographer Joe Riis and a narrative written by Wyoming native and freelance writer Emilene Ostlind.

"I get really excited about science communication," said Ostlind. "An infographic can portray so much information. It makes an idea come to life on a page."

The atlas is but one component of a multi-pronged project funded in part by RMEF to enhance knowledge about ungulate migrations. Matt Kauffman, director and cofounder of WMI, has been working with project coordinator and cofounder Bill Rudd and WMI staff to build an online viewer that will broaden the reach of their work to both the public and conservation groups.

A living document of ungulate migration, the online viewer is an ongoing compilation of the detailed movement of Wyoming's ungulates. It helps identify pinch-points where ungulates are most vulnerable, giving wildlife managers and conservation groups such as RMEF a great tool to prioritize their efforts.

"The database is designed to meet that need by pulling together all of the migration data in Wyoming and making

it available in one online portal," said Kauffman. He hopes both the atlas and the online viewer will be a breakthrough for biologists and conservationists alike.

Holly Copeland, conservation scientist at the Nature Conservancy, also sees great potential in the program.

"I think it's huge and absolutely novel. There has not been anything with this level of detail about where the animals are," Copeland said.

Doug McWhirter, wildlife biologist for the Wyoming Game and Fish Department, agrees.

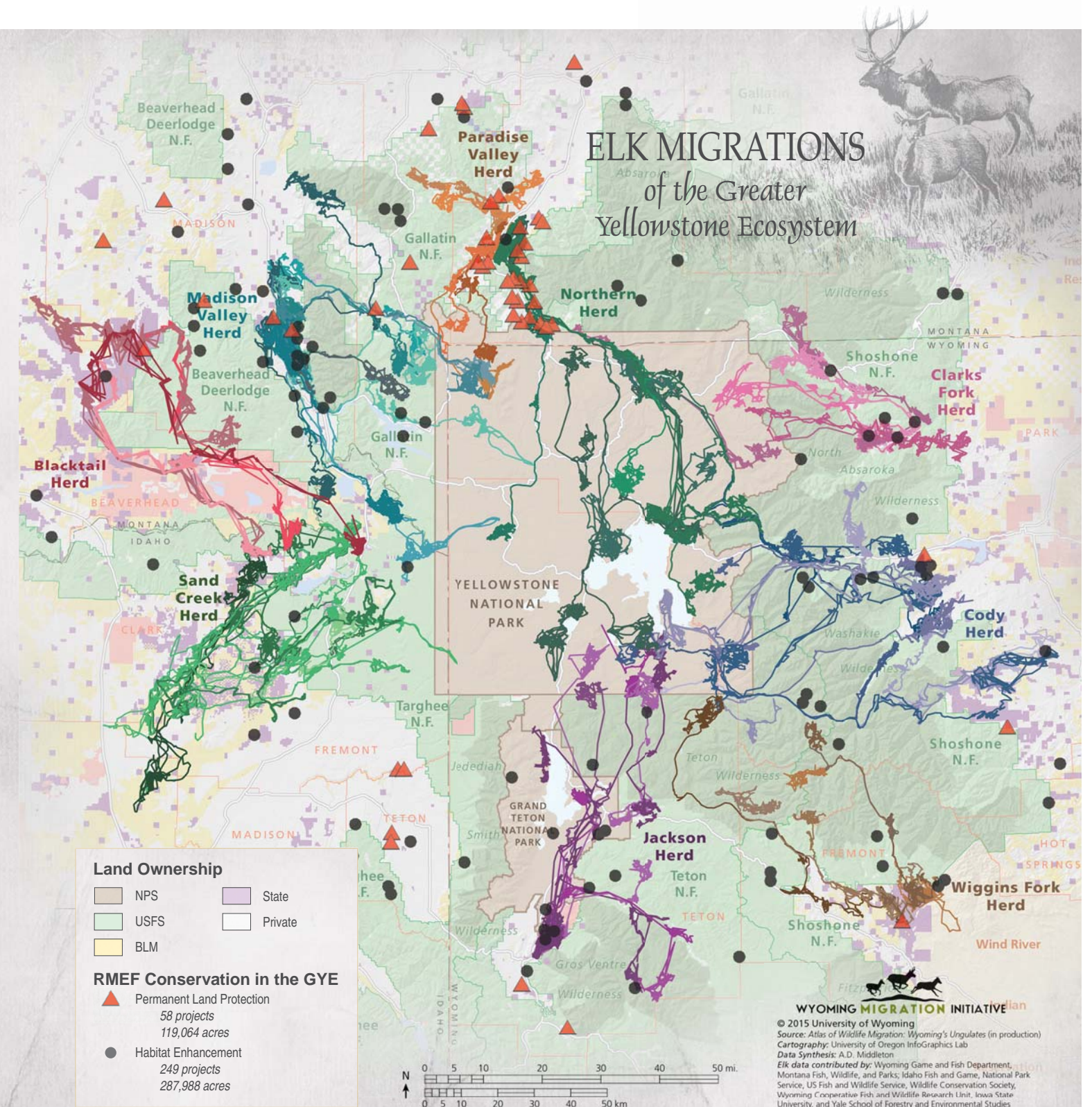
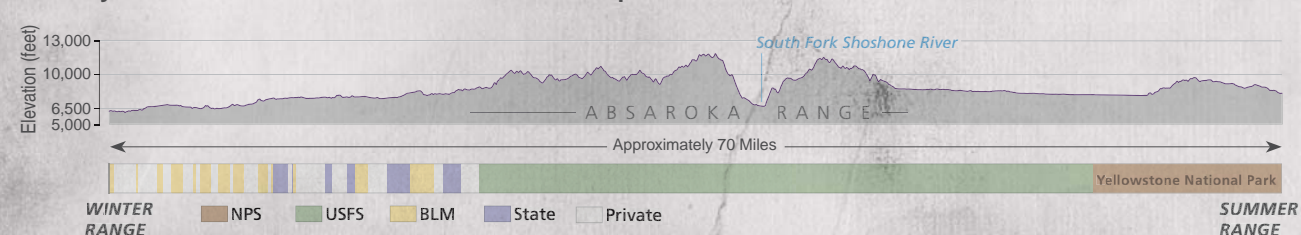
"To have one central location that has the totality of ungulate movement data throughout the state of Wyoming in one place is pretty powerful."

Kauffman is also working with Copeland to track mule deer herds in the Greater Yellowstone Ecosystem as they migrate to their summer ranges. The pair have collared 90 mule deer, and have been releasing weekly Twitter updates on the various herds' progress through animated maps.

"I get this adrenaline rush just watching them," said Copeland. "I think it's a hopeful message that [long distance migrations] actually still exist."

—Sophie Tsairis, Bugle Intern

Journey of Elk #35342: Elevation and Land Ownership



WYOMING MIGRATION INITIATIVE  
 © 2015 University of Wyoming  
 Source: Atlas of Wildlife Migration: Wyoming's Ungulates (in production)  
 Cartography: University of Oregon InfoGraphics Lab  
 Data Synthesis: A.D. Middleton  
 Elk data contributed by: Wyoming Game and Fish Department, Montana Fish, Wildlife, and Parks; Idaho Fish and Game, National Park Service, US Fish and Wildlife Service, Wildlife Conservation Society, Wyoming Cooperative Fish and Wildlife Research Unit, Iowa State University, and Yale School of Forestry and Environmental Studies



**PORTRAITS OF AN OLDER WORLD—** Covering more land than the state of Maine, the Greater Yellowstone Ecosystem is among the West's most pristine strongholds that still host a full assembly of the large mammals documented by early explorers and trappers such as Jim Bridger. Modern mountain man and photographer Joe Riis (lower right) grew up hunting elk. Then after earning a degree in wildlife biology from the University of Wyoming, he took to photography as a way to be outdoors while connecting people with wildlife. Over the past decade, he has become world-renowned for his camera-trap work documenting Wyoming's great pronghorn and mule deer migrations. Elk migrations have been his most recent focus, but inevitably his photos have included another high-country traveler—grizzly bears, which still rule at the top of the food chain here.





impacted by development, will be published in a “migration atlas.” The 200-page book is due out the fall of 2018 and will pair maps with 500-word narratives to tell the stories of Wyoming’s migratory ungulates. “They’re scientific stories, but the atlas tries to tell them in these graphically accessible and compelling ways,” Kauffman said.

RMEF is helping to fund the creation of the atlas as well as WMI’s development of an online interactive migration database and viewer. The viewer is a map with pinpoints showing where ungulate studies have been done. Clicking on the point reveals a pop-up with a summary of the study, contact information, publications, funders and other key information. So far, biologists have uploaded 30 studies about pronghorn, bighorn sheep, elk, mule deer and moose. The viewer can be accessed from WMI’s website and is currently free and available to the public and managers alike. Kauffman hopes it’s just the start. Like following in the footsteps of the elk, it can be slow going, but WMI is providing the best available information to managing agencies, energy developers, conservation groups and private landowners.

“Now groups that are working on those corridors have the best science in their hands,” Kauffman said. “We’re creating a central place where stakeholders can come together to identify problem spots and use that to guide their work.”

### What it Means on the Ground

Delissa Minnick, field manager of the Bureau of Land Management’s Cody field office, is one of the beneficiaries of this work.

“It helps us prioritize our overwhelming workload,” she said. “Those studies really help shine a spotlight on the importance of migration corridors and get the public support behind it, helping us build

those partnerships that are essential to getting this much work done on a landscape this size.”

The science may be what motivates Minnick’s office, but it’s the photographs and videos that capture the attention of the public. Minnick said Riis’s visceral documentation of the migrations has helped sway public involvement in conservation.

“It’s really unique how Middleton’s group and the Wyoming Migration Initiative are translating their science into laymen’s terms,” she said. Seeing images of hundreds of animals backed up behind fences or struggling to cross highways presents a concrete example of barriers along their migration routes. “That really gets people interested and engaged to the point that they want to put their work gloves on and get their boots dirty and get out there and help us fix it.”

Case in point: following the striking and well-publicized imagery and other documentation of the “Path of the Pronghorn,” Minnick’s office experienced a flood of interest in a decade-long fence removal project their staff conducts each year on Public Lands Day. Volunteers have replaced miles of net-wire fence with wildlife-friendly fence along a key migration route for pronghorn and mule deer in the Bighorn Basin

“We had the biggest turnout ever after we’d gone out to the public with (WMI’s) outreach,” Minnick said. “The public support was really unprecedented.”

In 2010, the Wyoming Game and Fish Commission designated wildlife migration corridors as “vital.” What they’ve learned from the antelope, mule deer and elk migration research since then makes that move look visionary, but also just a first step. Consider the following findings from the Wyoming Mule Deer Initiative:

- Mule deer have declined by 40 percent in the past 20 years.

- Migratory segments of the population are the most productive.
- Development that disrupts migration can have herd-level impacts.
- Mule deer spend 95 percent of the migration period foraging at key stopover areas.
- Deer tolerate disturbance between stopover areas, but development at those foraging areas is far more likely to displace them.

In January, the commission voted to adopt a new strategy to conserve migration corridors. It includes an updated set of definitions that make it easier for managers to pinpoint and protect critical stopover points along migration paths as well as bottlenecks that constrict movement. Under the updated migration corridor strategy, the commission called for “no significant loss in species distribution or habitat.”

Middleton’s work on the migrations has led him to see elk as a great mobilizer. Their story helps bring together disparate groups to talk about what it will take to keep these great tides of animals flowing back and forth across this landscape every spring and fall.

“I think elk are going to be part of how we think about [building partnerships] in the Greater Yellowstone,” he said. “They can help us learn, because they require collaboration across boundaries. They can help us start to tackle some of the other transboundary challenges that are maybe harder for people to get excited about.”

Joe Riis sees allowing elk to move freely through the landscape as necessary for continuing a way of life many in Wyoming hold dear. Living alongside and being able to hunt these wild animals requires leaving a certain amount of space wild on their behalf. He sees carefully planned development of residential areas

and roads as a good starting point.

“It’s about making sure we can continue to have wild animals,” he said. People living in the rugged wilds of the American West can forget their landscape is a rarity in modern times, he said. “The Greater Yellowstone is one of the last strongholds of these massive herds of elk and other ungulates.”

Losing those wild spaces could mean losing migrations altogether, said Kauffman. He called migration a “dwindling phenomenon,” adding that Wyoming is still in good shape due to a relatively small human population and slow development. But people are steadily changing the landscape. Knowing the routes before development begins is crucial to protecting them, and requires collaboration and research.

The Wyoming Game and Fish Commission’s migration corridor strategy concludes with this: “It is important to understand that migratory behavior can be lost and loss of the ability to migrate has led to sudden and dramatic declines in animal populations. Migration is a learned behavior that may be difficult to reestablish once lost or diminished.”

Standing on the hard-caked elk prints on Needle Mountain, Riis stretches his hamstrings, Nichols focuses her lens and Middleton considers the next step in his research: crossing the snowfield. For generations, elk have followed this path deeply engrained in their collective memories. For the scientist, photographer and filmmaker, the way forward, physically across the snowfield and more figuratively through stewardship decisions, is uncertain. What they do know is that each step is a small discovery, a window into elk’s hidden biology.

*Nicky Ouellet is a recent Bugle intern. The only animal she tracks is her dog.*

## 30 Years of Giving Yellowstone Elk Room to Roam

**From the day RMEF had a dollar to its name it has worked to keep great tides of elk flowing across this landscape.**

RMEF was barely out of diapers in 1985 when it wrote what was a staggering check for the year-old organization: \$450 to help fund a study into human disturbances on the migrations of the Northern Yellowstone elk herd.

By today’s standards, it was a pittance, but it marked the first time RMEF had been able to help fund wildlife conservation—hugely symbolic for an outfit that was staking its existence on

ensuring the future of wild, free-ranging elk. The Elk Foundation has gone on to fund more than 600 research projects in 32 states to the tune of \$8 million so far. Those studies have deepened our understanding of elk, other wildlife, landscapes and how humanity shapes them all.

It’s also fitting that RMEF’s first project sought to identify the pinch-points for one of America’s greatest elk migrations. Three years later,

backed by a growing army of elk enthusiasts, RMEF secured \$500,000 from Anheuser-Busch to pull off its first permanent land protection project—the purchase of the 16,440 acre Robb Creek Ranch east of Dillon, Montana, in 1988. Now known as the Robb/Ledford Wildlife Management Area, this secured a critical swath of winter range for the 3,000-strong Blacktail elk herd in the Greater Yellowstone Ecosystem’s (GYE)

northwest corner. Nearly 30 years later, it remains one of Montana’s most prolific herds, migrating en masse each winter out of the Snowcrest and Gravelly mountains.

That win was soon followed by a salvo of RMEF-led permanent land protection projects along the key migration corridors in the GYE. It reads like a greatest hits of critical habitat in need of protection—places like the 7,800-acre Royal Teton Ranch, 5,000-acre Dome Mountain, 28,000-acre Thunderhead, the historic 3,300-acre OTO Ranch, 2,800 acres added to Idaho’s 30,000-acre Tex

Creek—landscapes that have paid dividends to generations of hunters and to the masses of tourists who flock to this region from around the world to see wildlife. In fact RMEF’s land protection playlist now runs nearly 120,000 acres long in the GYE.

Yet that’s only half the story. RMEF has also helped fund more than 250 stewardship projects to enhance 288,000 acres of elk habitat in the GYE, sometimes on the same landscapes we helped usher into the public hands years ago. That includes dozens of prescribed burns and scores of projects to combat noxious weeds that threaten the lush

native forage this area is so famous for. It includes aspen-rehabs to keep the ridges painted gold and elky come fall, sagebrush restorations, fence removals, water-source enhancements and more than a dozen other methods to make this outstanding elk country.

Like every landscape, the Greater Yellowstone still has serious conservation challenges to contend with, and RMEF’s duty here is never done. But with more than three decades of commitment to ensuring the future of these world-famous herds, elk have a formidable ally.

—Paul Queneau