

MOVING RIGHT ALONG

How FWP, landowners, and conservation groups help ease the way for wildlife to migrate and move seasonally from one habitat to another.

BY ANDREW MCKEAN

► **EVER ON THE GO** Mule deer ford a channel of the Missouri River near Craig. Rivers and especially roads and fences may block not only big game migrations between summer and winter range but also necessary movement to food and water sources within seasons.

PHOTO BY JOHN WARNER

Brett Dorak looks at barbed-wire fences the way a mechanic might look at your car. He eyes the structure, style, and performance of common roadside fences not only for their ability to keep livestock in a pasture, but for their tendency to keep wildlife out. Dorak knows that something as simple as a low bottom wire on a fence can be the difference between life and death for pronghorn, commonly called antelope, which try to scoot under fences rather than vault over like deer and elk.

For two years, Dorak, the Montana Fish, Wildlife & Parks area wildlife biologist in Malta, has been compiling GPS locations from about 60 collared pronghorn that move vast distances each year across the prairies south of U.S. Highway 2. In places with passable fences, the locations string north and south, indicating where pronghorn move with the seasons. But in places with impassable fences, the location dots on a map show where the animals gather and mill looking for crossings. Stymied by the barbed-wire barriers, pronghorn are more likely to be hit by vehicles and killed by predators, and are more susceptible to exposure and starvation.

“Before we had these collars, we could only guess at impediments to migrations,” says Dorak, whose pronghorn migration study is one of a half dozen around the state. “Now, we can actually see—from GPS locations—these bottlenecks. The next step is to try to make the barriers passable.”

In many cases, that means approaching a rancher with an offer to retrofit fences, especially old woven-wire sheep fences that are almost universally impassable to pronghorn. Most landowners appreciate wildlife

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and want to help accommodate movements across their ranch. But with the cost to replace fencing running up to \$10,000 per mile, it's not always feasible on their own. That's why many ranchers are receptive to working with FWP and other partners. The new or modified fences, with a raised, smooth wire on the bottom and properly spaced barbed wire above, keep cows in but let pronghorn and mule deer pass under or over without harm.

Similar fence modifications elsewhere in remote Phillips County are enabling one of the world's longest ungulate migrations, a 550-mile-long trek of pronghorn between south Saskatchewan and the Missouri River.

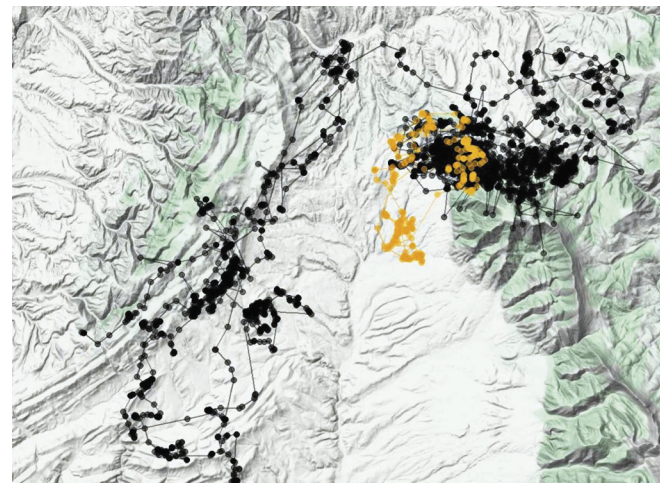
All these Hi-Line ranches might be considered mechanic shops of migration mitigation. This is where the hard work of making local landscapes permeable gets done.

Rancher Leo Barthelmess is taking fence remediation to the next level. Barthelmess has actually removed most internal fences from his operation. Instead of barbed wire, he now

controls his cows by using tracking collars similar to those that Dorak uses on pronghorn. These bovine equivalents of canine shock collars, guided by cell-phone signals rather than satellites, train the cows with audible and stimulatory cues to stay in pastures that aren't delineated by wire.

“There's a bit of a curve as they learn where they can go and where they can't, but in a surprisingly short period of time they're trained to stay within a geofence defined by our cellular collars,” Barthelmess says. The collars and cellular infrastructure were largely funded by a federal grant. “The result is less wire on the landscape and fewer impediments for pronghorn and other wildlife to navigate, and we can more intensively graze cattle in smaller pastures, moving them more frequently to mimic historical bison grazing patterns,” he says.

Across Big Sky Country, ranchers, biologists, and land-use planners are finding ways to let wildlife pass without encumbrance, using data from GPS collars to see where our wild neighbors—pronghorn, deer, elk, bighorn sheep, and even grizzly bears—travel. They then help wildlife move between and around human habitations and infrastructure to complete seasonal migrations they



▶ ALL OVER THE MAP This map shows the locations (yellow dots the most recent) of where radio-collared elk moved across a south-central Montana mountain range. With maps like these, biologists can see which core summer and winter habitats animals use, seasonal movements within winter and summer ranges, and migration routes between the ranges. The information is vital in understanding what elk need to survive, what areas may need protection, and where migration or movement blockages occur and may require remediation.

MONTANA FWP



have been undertaking for far longer than Montana has been a state, as well as make essential daily movements.

Their continued ability to do so—as Montana's population increases and we build more fences, highways, and subdivisions in their way—will be one of the great challenges of wildlife management in the coming decades. So it's worth looking at places where Montanans are finding ways to remove obstacles so wildlife can get to where they need to go.

ANCIENT ROUTES

All animals need to move. Within a season, wildlife may travel in search of water and food or to find ideal nesting habitat or places to safely rear their young. Many species also migrate—covering even greater distances between summer and winter range. Some migrations are modest, like sharp-tailed grouse traveling from a snowdrifted upland to a protected creek valley just over the ridge, or elk in the Missouri Breaks moving only a few dozen miles between winter range and spring calving grounds.

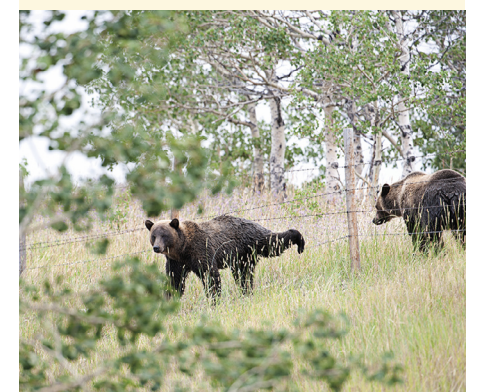
Other movements are epic, like the 125-mile trek of elk that winter in the upper end of Paradise Valley but summer on the

southern slopes of Yellowstone National Park. Or the transcontinental migrations of raptors, shorebirds, and waterfowl.

Avian migrants have the benefit of flying over and around barriers. But land-based wildlife face more extensive and intractable barriers. Busy roads and impassable fences are the most well-known blockages that disrupt “connectivity”—the degree to which the landscape allows animals to move from one place to another. Railroads and irrigation ditches block movements of smaller creatures. Reservoirs and towns get in the way of meandering ungulates. Montana's fastest-growing areas—like the north-south river valleys that drain the Yellowstone Plateau—are among the very corridors that migrating mammals have used most intensively for thousands of years.

Black and grizzly bears don't migrate, but they do make seasonal trips in spring and fall that follow brushy stream corridors from forested mountains into lowlands. That sometimes brings them close to towns and ranches. Every spring, Wesley Sarmiento, FWP's bear management specialist based in Conrad, monitors grizzly bears that traipse out of the Bob Marshall Wilderness Complex, following food along stream

▶ FENCED IN AND OUT Barbed-wire fencing is necessary to delineate property boundaries and keep cattle off roads. Yet it also hampers the movement of some wildlife species. Elk (above) and moose are tall enough to negotiate most fences, but bears (below) and other species often struggle to get through the barriers.



corridors, into the wheat fields and pastures of the Rocky Mountain Front and occasionally into nearby towns like Valier. Sarmiento's responsibility is to try to keep the bears away from people.

“Most grizzly bears that make it really far out east are juveniles dispersing because they've just been chased off by their mother

TOP TO BOTTOM: DUANE HUJE, KERRY T. NICKOU



and are exploring new areas,” he says. “Our job is to ensure that they don’t get in trouble and to respond quickly when they do.”

Sarmiento hazes bears away from places where people live, and he works with livestock producers to prevent conflicts, such as by removing livestock carcasses near ranch homes and towns and installing electric fencing. “All these strategies have greatly decreased bear activity in and around Valier,” he says. At the same time, grizzlies are able to maintain their historical seasonal movements, now with occasional detours around places where they might cause problems.

Wildlife managers throughout North America have been monitoring, mitigating, and accommodating wildlife movement for more than a century. Recognition of the collective responsibility of managing migrating wildlife led to the 1918 Migratory Bird Treaty Act. In the 1930s, Montana’s then-named Fish and Game Department identified winter migrations of elk and purchased game ranges, now called wildlife management areas, along the Sun and Judith rivers to provide elk with low-elevation winter habitat.

Dorak says his predecessors first began studying Hi-Line pronghorn in the 1950s, using binoculars to watch the cross-border migrations he now follows on a computer screen.

► **HELPING THEM CONTINUE** Pronghorn evolved on grasslands, where leaping over obstacles was rarely necessary. When faced with barbed-wire fences, they almost always try to slip underneath the bottom strand. Ranchers who replace the low barbed strand with smooth, elevated wire at key crossings (above) make it easier for the animals to continue epic migrations that require crossing hundreds of miles of terrain and sometime even reservoirs and rivers (below).



Across the country and the world, wildlife migrations have grabbed the public’s attention in recent years because data from GPS collars and remote camera traps have revealed a previously hidden world of animal

behavior. High-profile wildlife migrations—which include impossibly long mule deer treks and elk movements that can thread across state lines and multiple mountain ranges—have intrinsic appeal. They also

cause us to marvel at wildlife’s amazing tenacity, like the pronghorn herd that one spring swam across Fort Peck Reservoir following ancient routes embedded in their DNA.

The human barriers to these incredible journeys have also caught the public’s eye—especially here in the spacious American West where it seems improbable that wildlife wouldn’t have room to roam.

Growing recognition that critters must move to survive underpins a 2018 order from the Secretary of the Interior that provides federal funding to identify migration routes and mitigate barriers. That’s what pays for Dorak’s fence remediation and a host of other migration-related projects across Montana. FWP, in its recently drafted Terrestrial Wildlife Movement and Mitigation Strategy, aims to identify the corridors and “landscape permeability” that enable migration and seasonal movement.

MAKING ROOM IN THE MADISON

Harry Liss delights in inviting visitors into his upper Madison Valley kitchen by offering them a breakfast of “poached eggs and elk.”

The joke is a big hit with game wardens,

Perhaps the most effective tool of all is landowner tolerance for having wildlife on their property.

says Liss, whose house is just downstream from Quake Lake. In summer, enough elk trickle through to give the wordplay some traction. But in winter, his

place is covered with bighorn sheep. Deep snow drives the mountain ungulates down from the high country along the Idaho state line to the sagebrush flats around Liss’s homestead. This is yet another type of migration—elevational movement between high-country summer habitat and lower-elevation winter range.

“I built my house where they winter, so I figure it’s my duty to give them some quarter and protection,” says Liss, who works with neighbors in his rural subdivision to keep barking dogs and revving snowmobiles from stressing the bighorns. “I enjoy having sheep around, but I’m even happier when spring comes and they drift back up into the mountains.”

Farther down the Madison Valley, Jeff Klein makes similar accommodations for migrating elk. The manager of a large ranch near Ennis, Klein has had to adjust almost all of his agricultural practices in order to separate cattle from elk that might carry



► **DODGING THE RAM** Roads and vehicles can even disrupt seasonal movements of bighorn sheep that move down from high elevations to lick road salt and graze on roadside vegetation.

Recent projects help wildlife keep moving

For decades, FWP and partner organizations have identified critical migration routes and protected key habitats that anchor seasonal movements. Ducks Unlimited, for instance, has been working with Montana biologists since the 1980s to protect breeding potholes and grasslands north of the Hi-Line used by waterfowl flying from wintering areas along the Gulf of Mexico.

In recent years, a Secretarial Order from the Department of the Interior (SO3362) has provided funds for even more migration enhancement and core habitat protection. The projects below, totaling \$1.1 million, benefit land-based wildlife. They were funded in 2020 and awarded via a competitive process. FWP biologists and technicians helped identify project priorities and carry out the fence remediations and other work:

- \$472,000 for a Hi-Line fence and education project awarded to the Ranchers Stewardship Alliance through the National Fish and Wildlife Foundation (NFWF).
- \$68,772 for a Big Hole Valley fence project funded through the U.S. Fish & Wildlife Service’s Partners for Fish and Wildlife Program.
- \$166,000 for the Horse Prairie Big Hole fence project, funded through the NFWF.
- \$400,000 for a conservation easement in northwestern Montana awarded to the Trust for Public Lands and funded through the NFWF.

Some of the 2.1 miles of woven wire fence removed and replaced with wildlife-friendly four-strand wire in the Horse Prairie fence project using SO3362 funds.



LEFT TO RIGHT: PAUL QUENEAU, SIMON BUZZARD, NATIONAL WILDLIFE FEDERATION
OPPOSITE PAGE PHOTOS: JOE IRIS

brucellosis, a bacterial infection that can cause cows to abort their calves.

Klein puts as much distance as he can between his cows' calving grounds and the elk that occupy the higher benches of the ranch. He rations hay in the winter so there's no surplus that might attract elk, and in the summer he cuts forage earlier in the season to reduce the appeal to elk in search of succulent greenery.

Madison Valley ranchers are spending more time accommodating elk because seasonal migrations are slowing and morphing into resident herds, Klein says. That's partly because the valley is being filled in by more fences, more rural homesites, and more impediments to migration.

Montanans need to recognize those cumulative effects, says Gary Burnett, executive director of the Heart of the Rockies Initiative in Missoula. Burnett negotiates

What's new is that there is now funding and renewed energy around reducing migration barriers on public and private lands.

agreements between public agencies and private landowners that promote wildlife migration. Burnett's 10 years as director at the Blackfoot Challenge, a group of landowners and conservationists that promotes sustainable ranching from Lincoln to Potomac, showed him the benefits—to wildlife and to producers' financial bottom line—of working with multiple neighbors across a wide landscape. Nowadays he's also leading the Migration Coalition, a consortium of conservation groups interested in

finding landowner-friendly solutions to wildlife movement barriers and disruptions.

"We see three needs for wildlife movement and mitigation," Burnett says. "Managing subdivisions by working on voluntary agreements with landowners. Promoting permeability practices with highways and other infrastructure. And more stewardship that keeps land productive for agriculture."

In many cases, those are the same prescriptions that result in productive habitat for year-round wildlife residents, says Lauri Hanauska-Brown, FWP's wildlife project facilitator.

"Wildlife migration has been elevated in visibility in recent years, but as an agency, we've been conserving priority habitats like wildlife management areas and conservation easements for decades," Hanauska-Brown says. "In many cases, those lands were prioritized because of their value as

The implications of gathering data

The increasing use of GPS collars on wildlife has provided fascinating insights into how animals move across landscapes. It has also put state wildlife officials in a tough spot as they decide who is allowed to use the data generated by the collars.

Similar to national discussions about digital privacy, wildlife managers are navigating the tricky path to ensure that GPS data is available to those who need it to reduce migration barriers and study wildlife dynamics. But because wildlife movement details could also be used by hunters and outfitters to target high-use routes or migration bottlenecks, agencies tend to closely hold the most specific data.

"In some cases, it's a matter of scale," says Lauri Hanauska-Brown, who coordinates FWP's special wildlife projects. "For instance, if the collars identify a pinch point where mule deer pass for a single week every year, it wouldn't be ethical if hunters were able to concentrate around that specific spot. It wouldn't be legal, either, because under state law, people can't use location data to kill or harass wildlife. Similarly, we don't want to publicly identify ranches that might play essential roles in a species' migration path because that could inappropriately focus attention on their operations."

But the big picture, showing the sweeping scale of wildlife migrations such as pronghorn moving across the Hi-Line or mule deer in Carbon County moving between winter and summer range (right), needs to be shared with the public.

"These are fascinating examples of some of the most extensive wildlife migrations on record," Hanauska-Brown says. "The fact that they're still happening, and that we're still discovering things we didn't know, says a lot about how well Montanans have conserved the permeability of most landscapes. It's important for people to know that."

Hanauska-Brown says FWP is working to find the sweet spot that satisfies the public's right to wildlife movement data while still protecting those priority landscapes that species have moved across long before biologists had satellites or global-positioning technology to track them. ■



Map with arrows showing the general movements of radio-collared mule deer in Carbon County.



FINDING WHERE THEY GO Biologists and landowners gather many types of movement data that can help identify movement barriers. Left and above: GPS collars are the most accurate tools for identifying precise routes. Maps of this information are helpful for deciding how to ensure that wildlife can continue to move, such as by adjusting fencing or re-siting natural gas wells.



"VENCING" Left: Some ranchers are using virtual fencing collars to reduce the amount of barbed wire on their property. The collars work like those for training dogs, stimulating cows if they try to cross GPS locations programmed into the devices.

FENCE MODIFICATIONS Right: Different fence types can be adjusted to accommodate different wildlife species and needs. The top railing of wood rail fences can be temporarily removed to allow elk to jump over during certain times of year. The bottom strand of barbed-wire fences can be raised a few inches and replaced with smooth wire so pronghorn can scooch underneath and carry on journeys that sometimes cover hundreds of miles.



OPENING THINGS UP Right: Many big game animals move along wildlife corridors such as wooded rivers connecting national forests with WMAs or conservation easements. Highways are major barriers to these migrations. Solutions include the 42 wildlife passageway culverts installed under stretches of U.S. Highway 93 by the Confederated Salish and Kootenai Tribes and Montana Department of Transportation. Also maintaining connectivity are landowners who tolerate wildlife on and moving across their property.



migration corridors or as core habitats that anchor migrations."

What's new, she says, is that now there's funding and renewed energy around reducing migration barriers on private and public lands. "We realize that landowners are critical to continued wildlife presence on our landscape, and we have more tools to help them help wildlife."

Perhaps the most effective tool of all, Hanauska-Brown adds, is landowner tolerance for having wildlife on or moving across

their property. "But we know it's not always easy, and we recognize that wildlife can cause problems. That's a major reason we're committed to partnering with ranchers and farmers to come up with solutions that work for them and for wildlife."

Back in Phillips County, rancher Leo Barthelmess watches his cows spread out across a fenceless pasture that migrating pronghorn can cross without interruption. Two years into his experiment with shock collars for his herd, he's happy with the results.

"These collars are never going to replace fences entirely, because you still need perimeter fences to be a good neighbor and keep your cows off the road," says Barthelmess, former director of the Montana Stockgrowers Association and an active member of the Rancher's Stewardship Alliance, which advocates wildlife-friendly ranching practices. "But I love moving cattle, I love managing grass, and I love helping wildlife. These collars are just another tool to help me keep doing what I love." 🐾

CLOCKWISE FROM TOP LEFT: MONTANA FWP; SHUTTERSTOCK MARK C. BOESCH; CRAIG & LIZ LARCOM; MDT; MDT; KEVIN WAGNER