PRONGHORN IN MOTION

A new study finds that many pronghorn migrate hundreds of miles each year, often struggling to overcome a growing number of obstacles along the way.

BY **BEN LONG**

LONG ROAD HOME A herd of several hundred pronghorn migrates north across Montana near Fort Peck Lake toward spring fawning grounds in southern Canada. In some years the animals will travel hundreds of miles during their seasonal migrations.

PHOTO BY MICHAEL FORSBERG

Under the big sky of the high plains, a herd of pronghorn stands out amid the sage and bunchgrass, the tallest natural features along the skyline. They snap to attention the moment a truck slows, and when the vehicle stops and binoculars come out, the animals trot off over the horizon.

This vast, open country that scientists call the Northern Sagebrush-Steppe Ecosystem seems an unlikely place for secrets. But until recently, pronghorn possessed an important one—the location of core habitats and the routes they use to migrate throughout the year. Now scientists are discovering these critical summer fawn rearing areas, wintering sites, and ancient pathways along which the prairie denizens move back and forth across portions of the northern Great Plains each year. They're also finding what obstacles—natural and man-made—impede the animals' migrations. The research is timely and essential. Natural gas wells, oil pipelines, wind turbines, housing subdivisions, and other developments in northern Montana and Canada's prairie provinces continue to expand. Unlocking the secret to the pronghorn's mysterious spring and fall migrations is critical to finding ways to ensure that these age-old seasonal movements can continue.

PULLED BACK FROM THE BRINK

Though commonly called antelope, pronghorn are not related to gazelles, eland, or other true antelope species, which are native only to Africa and Asia. Pronghorn are an endemic North American ungulate, a holdover from when mastodons, ground sloths, and other ice age mammals roamed the continent. In all the world, no other species is like the pronghorn. Its closest genetic relative is, of all things, the giraffe.

Pronghorn have lived in North America for millions of years, surviving glacial eras, volcanic ash winters, and predation by the now-extinct American cheetah. But it took humans only 50 years around the turn of the 20th century to nearly wipe out the animals. After explorers and trappers opened the West, the teeming herds of wildlife observed just a few decades earlier by Lewis and Clark were quickly overrun. Ambitious pioneers punched railroads and telegraph lines across the prairie, plowing arable land and replacing hoofed wildlife with cattle. Pronghorn were shot by hungry farmers and unregulated market hunters. By the early 1900s the total pronghorn population in North America was reduced to fewer than 15,000.

Conservation-minded hunters and landowners eventually repopulated the plains with the fleet-footed animals. Working with state biologists, they trapped pronghorn in population strongholds and relocated the animals in historic habitat. Within decades, pronghorn had recolonized the American West, although in nowhere near pre-settlement numbers and only in marginalized fragments of their historic range. Today, pronghorn number over 1 million across North America. In some parts of the West they are common enough to take for granted.

Yet pronghorn populations remain vulnerable. According to northeastern Montana wildlife managers, the severe winter of 2010-11 cut populations in much of the region by 70 percent. Of more long-term concern, say biologists, is the increasing difficulty pronghorn have in making their seasonal migrations. Housing and fencing are spreading out from new subdivisions across southern

SPREADING THE WEALTH
A Montana Department of Fish and Game pilot hazes pronghorn into a trap on Townsend Flats near Helena in the mid-1940s. Thousands of the animals were trapped from strongholds and transplanted during the mid-19th century to restore a population that in Montana had dwindled to just 3,000.

JIM MCLUCAS PHOTO COLLECTION

JOE RIIS

UNFAMILIAR TERRITORY Captured by a remote-sensor camera, migrating pronghorn in northern Wyoming find easier winter walking in a river valley willow thicket. In severe winters, Montana pronghorn take similar routes through riparian areas and cattail marshes—and even onto railroad tracks and county roads—in order to move across snow-filled landscapes.

Canada. New roads, pipelines, and oil and gas wells are spreading across many parts of the northern Great Plains—from the Pinedale Anticline in Wyoming to the Bowdoin oil fields northeast of Malta to the coal-bed methane wells in southern Alberta. The resulting development pushes its way into established wintering habitat and summer grounds where pronghorn rear their fawns. Even worse, it chops great swaths of prairie habitat into isolated pieces. The resulting landscape fragmentation lessens what conservation biologists call "connectivity"—the degree to which pronghorn and other wildlife freely move from one place to another.

To find a balance between the needs of grassland wildlife and those of economic growth, western states and prairie provinces have begun to identify core habitats and migration routes so development can be sited in areas where it does the least damage and disruption. In 2008, the Western Governors' Association formed a wildlife council to learn where critical habitats and wildlife corridors would be harmed by proposed energy and housing development. The idea was to map the wildlife lands and routes so developers could modify plans in ways that protect winter range and fawning grounds as well as ensuring that landscapes remain permeable for highly mobile wildlife.

State wildlife agencies such as Montana Fish, Wildlife & Parks knew the locations of some core prairie wildlife habitats. But they lacked data on others, as well as on the routes pronghorn follow as they move between those sites. That's where Andrew Jakes came in.

In 2008, the Helena-based University of Calgary doctoral candidate began a transboundary study of pronghorn core habitats and seasonal movement in Montana, southern Alberta, and southern Saskatchewan. The study is funded by the Bureau of Land Management, the World Wildlife Fund, FWP, and the Alberta Conservation Association.

Jakes aims to learn how human activities affect pronghorn habitat and movement across the vast region. The study required using nets shot from helicopters to capture 102 pronghorn, which were fitted with collars carrying GPS transmitters. The collars recorded each animal's position every two hours, then dropped off after one year so Jakes could collect the data and plot each pronghorn's movements on computerized maps.

Three consecutive brutal winters sent many of the research animals on historic migration treks in search of food and milder conditions, allowing Jakes to document some of the longest land migrations ever recorded in the lower 48 states. In a single year, some animals traveled more than 300 miles. One intrepid pronghorn, number 169, was tracked starting near Glasgow as it moved north to Saskatchewan's Grasslands National Park in spring. Then in fall it headed back to Montana, where severe winter weather pushed it south all the way to Ingomar—a total annual trek of more than 350 miles (see a map of the trek on page 14). "The scale of these migrations is beyond those of African wildebeest and right up there with the barren ground caribou's," says Cormack Gates, professor of Environmental Science and Planning at the University of Calgary.

Ben Long is a freelance writer in Kalispell.

SIMILAR TO DUCKS

Jakes's findings confirmed what wildlife managers had long suspected. Rather than manage pronghorn like homebody species such as white-tailed deer, which can live their entire lives within a square mile or two of where they are born, pronghorn may require management similar to that used for migratory waterfowl.

Decades ago, waterfowlers and biologists learned that ducks often travel vast distances, many nesting in Canada's prairie pothole region then wintering in the warm wetlands of Mississippi, Louisiana, and Texas. By putting leg bands on ducks and tracking where the birds were shot by hunters, biologists began mapping waterfowl migratory routes, along with prime wetlands for nesting and overwintering. Also documented were critical resting and refueling "stopover" sites, such as shallow temporary wetlands. Private conservation groups such as Ducks Unlimited, along with state, provincial, and federal wildlife agencies, began protecting, conserving, and restoring critical waterfowl habitats in the United States, and even more so in Canada.

Pronghorn appear to require a similar transboundary approach. Jakes found that some pronghorn are "resident," meaning they stay within a relatively small home range year-round. But, like flocks of ducks and geese, many pronghorn head south in fall seeking more accessible food. Then, like waterfowl, the migrants return north in spring to raise their young. Justin Gude, head of wildlife research for FWP, says the findings underscore the need for wildlife managers in Montana, Saskatchewan, and Alberta to work together more cooperatively and pay attention to habitat conditions on both sides of the border. "If we want to manage for pronghorn hunting in northern Montana, we can't just look at where the animals live during the hunting season," he says. "We have to also consider what's happening hundreds of miles away in Canada."

Just as important as conserving core habitats is maintaining pronghorn migration corridors. "Ducks can fly over the tops of most barriers," says Gates. "But pronghorn have to put their foot in every little bit of their path. So what happens on the landscape is critically important."

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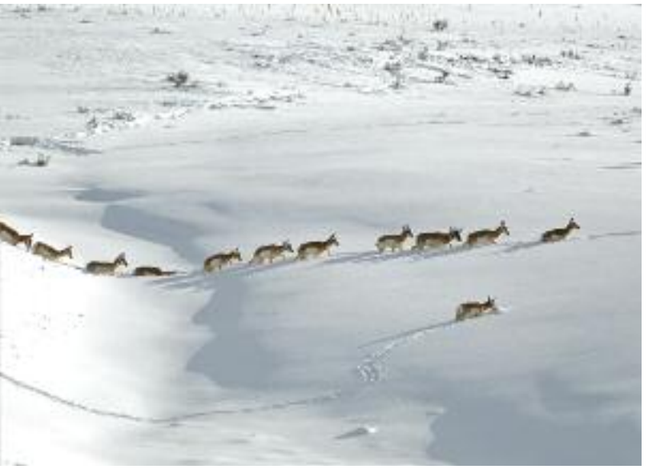
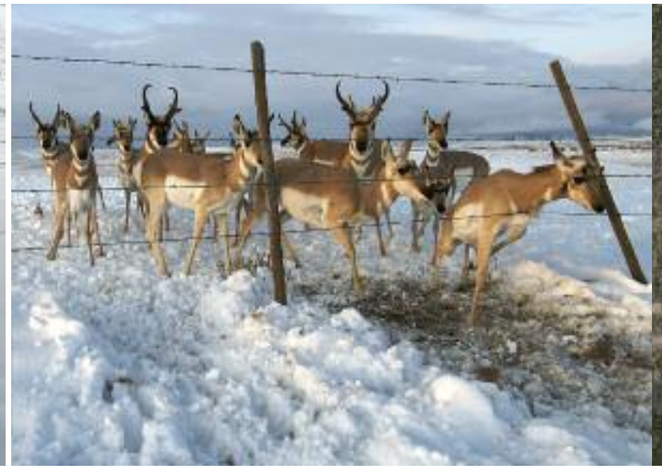
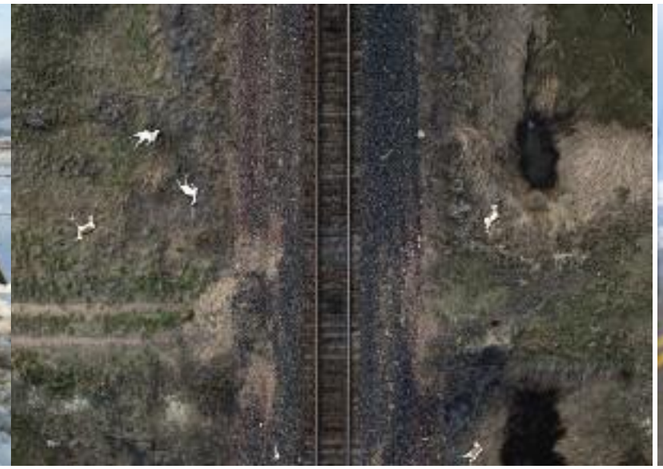
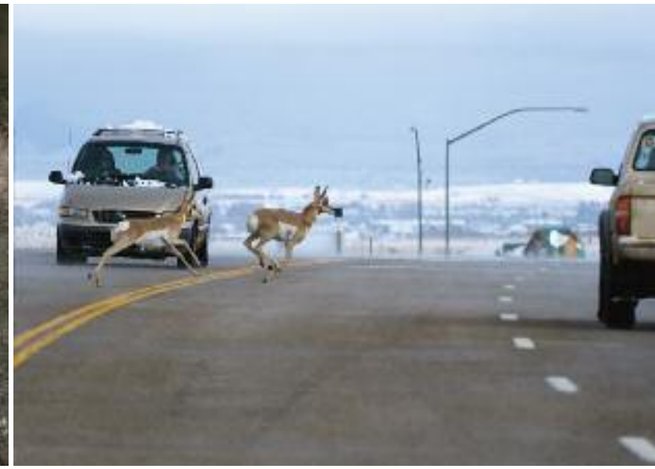








HARD GOING Historically able to follow bison herds that acted as snowplows, pronghorn now must break trail themselves. The animals are ill equipped to negotiate drifts like those that piled up across northern Montana this past winter. In any year, fences pose constant problems. If pressed, pronghorn can leap over obstacles, but they have not evolved to do so easily, as elk and deer have. In winter, they squander precious energy trying to bypass fences.

TRAIN WRECKED Deep snow forces pronghorn to travel along railroad corridors. Last winter hundreds trying to migrate along tracks were killed by trains in northeastern Montana, such as this section of line northwest of Glasgow. Cars and trucks are no friendlier. As human development grows across the northern Great Plains, so do highways and collisions between migrating pronghorn and moving vehicles.

LEFT TO RIGHT: JOE RIIS; JOE RIIS; CHRIS BOYER; JOE RIIS

BLOCKING THE WAY

A major impediment to pronghorn survival is deep snow. The animal's tiny hooves, perfect for running, are nearly useless for digging through snow to reach forage. In centuries past, pronghorn followed bison in winter, using the herds as snowplows for easier passage and to find food. But these days many pronghorn are forced to search for river bluffs and ridgetops, where prairie winds scour snow from patches of vegetation. Often that means heading south.

Some of the study pronghorn that summered in south-central Saskatchewan and Alberta headed to Montana when the weather turned cold. The pronghorn gathered in herds of up to 1,000 animals and moved south, conserving energy as they moved through deep snowfields by walking in single file. Winter storms turned some of the migrations into forced marches, pressing pronghorn to walk up to 30 miles a day. In early 2011, blizzards pushed many herds over frozen Fort Peck Lake and even farther south to Montana Highway 200 and beyond.

Other obstacles to pronghorn movement include roads, traffic, and new construction. In Alberta and Saskatchewan, conversion of

A LONG, WET CROSSING Last spring, pronghorn trying to return to Canada were stymied by massive Fort Peck Lake, which they had crossed months earlier when the reservoir was frozen. Many tried to swim across the vast reservoir. Some made it (facing page, below right), but many did not.

prairie into farmland, housing developments, and energy fields has already pushed sage-grouse there to the edge of local extinction. In northern Montana, energy development is growing too. Developers have drilled more than 1,500 natural gas wells in northern Phillips County, oil development from the Bakken oil field along the North Dakota border is expanding, and hundreds of coal-bed methane wells have popped up across Montana's southeastern corner.

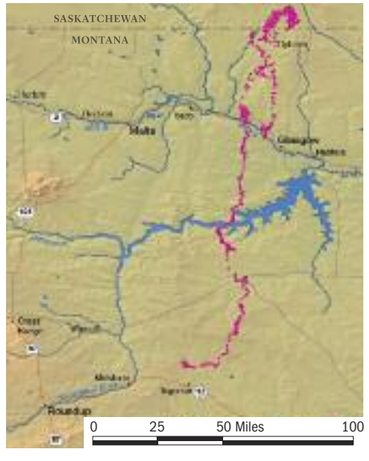
Throughout the northern Great Plains, fencing has long vexed a prairie mammal that evolved to negotiate barriers no taller than a sagebrush. Though pronghorn can jump wire fences, they do so reluctantly, preferring to crawl under. But they often get snagged on the bottom barbs, or can't slip under when snow is more than a foot deep. Most impenetrable are woven wire "sheep fences," which extend to the ground. During fall and spring migrations, pronghorn squander precious energy wandering up and down fence lines in search of a way through. In some cases, Jakes found that his research pronghorn spent hours trying to get past a single fence. "Just think how much time and energy those animals have to spend negotiating 30 or 40 fences in the middle of winter during a migration," he says.

Now finished with his field work, Jakes is analyzing the gigabytes of data he gathered. By next spring he'll know more about how various types and densities of roads, gas wells, and other developments affect pronghorn habitat and movement.

Some land managers have already begun putting his study results to use. Recently The Nature Conservancy of Montana used the migratory pathway data to find where fences on their conservation holdings need to be modified to enable pronghorn movement.

Record route

The 350-mile trip (pink dots) of pronghorn #169, February 2010 to February 2011.



MONTANA OUTDOORS; SOURCE: FWP

Losing essential migrants

Andrew Jakes, who is conducting one of the largest pronghorn studies ever done in North America, wonders if human development may eventually rob some pronghorn populations of essential migratory traits.

Jakes says some pronghorn in his study population are "residents" that stay in the same relatively small home range year-round. Others are migrants that move south in fall to find better forage in winter range before returning north in spring to rear their young. "No one knows why an animal chooses one strategy over the other," he says. Scientists suspect that the combination is an evolutionary adaptation that allows populations to endure under widely varying environmental conditions: Migrants survive harsh winters while residents do best in milder ones. Losing either strategy could doom a population over the long haul.

Jakes with a GPS collar.

Southern Saskatchewan and Alberta are the northern periphery of the pronghorn's continental range. Historically, migrant pronghorn in those areas moved south each fall into today's northern Montana to survive winter. During severe winters they moved even farther, as shown in the great treks Jakes documented in his recent three-year study. Before European settlement, the long-distance migrants could easily return to Canada in spring. "It's not that easy anymore," Jakes says. Incremental, cumulative developments on the prairie landscape—from Fort Peck Lake, built 70 years ago, to a gas well built last summer—make life harder for pronghorn moving between essential core habitats.

Jakes notes that 3,000 pronghorn that crossed frozen Fort Peck Lake last winter were stuck months later on the reservoir's south shore, urged northward to Canada by instinct, but blocked by miles of open water. What's more, the lacework of fencing that the animals negotiated as they fled south added another layer of obstacles for the return trip. "A big concern is that, over time, southern Alberta and Saskatchewan would not only lose their resident pronghorn in severe winters but also a large percentage of their migratory pronghorn that can't return because of barriers," Jakes says.

Some biologists believe that knowledge of when and where to migrate is passed down each generation from does to fawns. If so, essential migratory traits could slip away from a population that loses too many migrating does during a string of severe winters, causing the population to fizzle out. "Migration is an essential evolutionary survival strategy, and we don't want pronghorn to lose that ability," Jakes says.

—Tom Dickson

Mark Sullivan, FWP wildlife manager in Glasgow, says Jakes's findings emphasize the need for agencies, highway departments, landowners, and conservationists on both sides of the border to redouble efforts to make more room for the mobile prairie travelers. He and other wildlife managers, as well as local, state, and provincial planners, say they will be using data from the study to identify existing migration barriers, potential barriers, and bottlenecks. In time, the information will be shared with ranchers, transportation departments, and the energy industry to make sure economic growth considers and addresses the needs of wildlife. "People are finally starting to learn about the core habitats pronghorn use and the migration routes they take," Sullivan says. "That will make it a lot easier to adjust human development in ways that help these animals survive."

CLOCKWISE FROM TOP LEFT: MICHAEL FORSBERG; WINSTON GREELY/FWP; MICHAEL FORSBERG