FRONT RANGE FRACK FIGHTS | 5 | HIS HONOR THE MAYOR WEARS HEELS | 7 | THE ORCHARD BEAR | 26

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Of Sparrows and Sodbusters

Western and Mexican conservationists race against time to save grasslands – and the species that depend on them

By Sujata Gupta | Page 16

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By Stephen Ernst | Page 10

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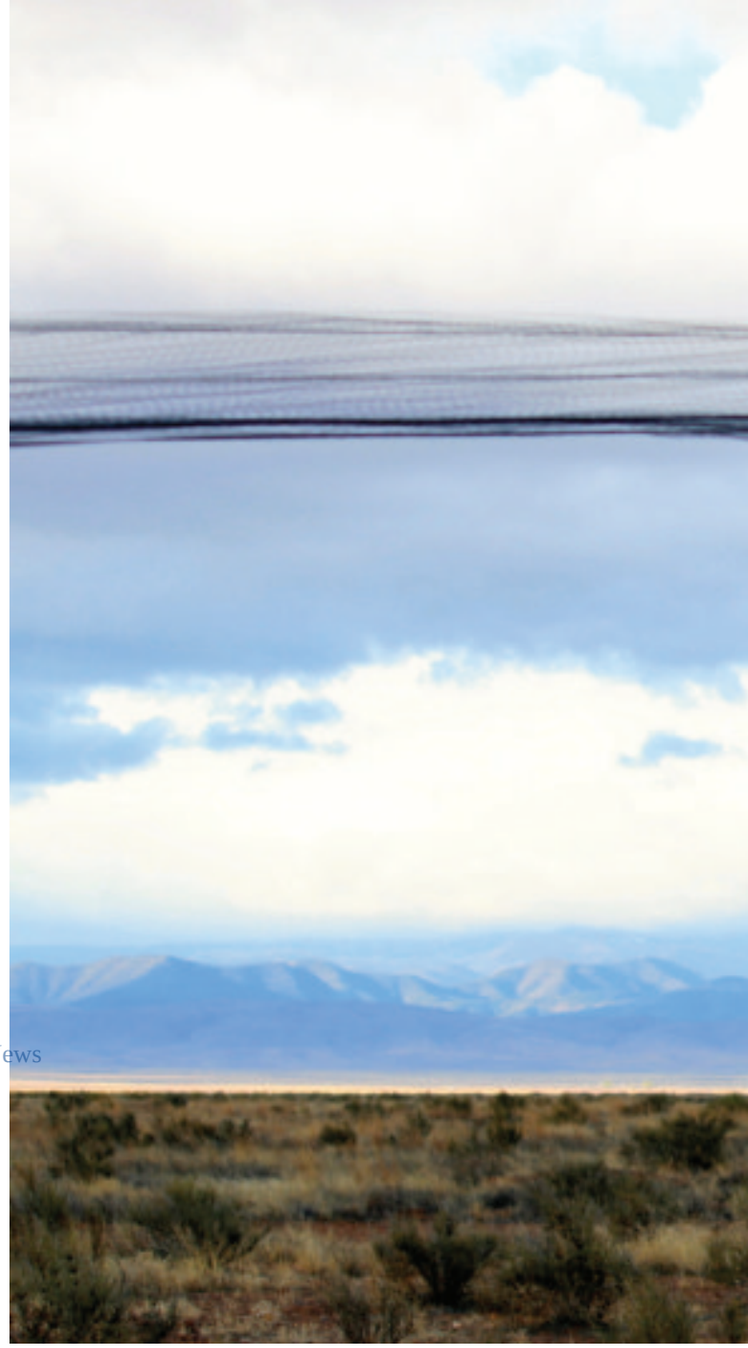

FEATURE BY SUJATA GUPTA

High on the Mexican Plateau on a stormy March day, fierce winds blow across the vast, flat Chihuahuan Desert grasslands and the distant peaks of the Sierra Madre. A group of scientists from U.S. and Mexican NGOs and universities unfurls a long net for catching birds and stakes it into the ground. A grasshopper sparrow tagged with a transmitter is around here somewhere, and we aim to catch it.

The bird, nicknamed Frequency 227, blends into the dust-brown backdrop. It and the other 13 Baird's and grasshopper sparrows on our list are the color of mud and sand, flecked with white, orange and yellow. They evolved with this vast grassland — which once stretched from the northern and central states of Mexico into southern New Mexico, Texas and Arizona — foraging each winter in grass grazed by bison, and hiding from predators in taller grass. Come spring, they flew to Montana, Wyoming, the Dakotas and Canada to breed. Ninety percent of the approximately 29 grassland bird species breeding in the Western Great Plains — including these sparrows — winter in the Chihuahuan Desert.

Since the 1960s, however, grassland bird populations have plummeted, some species by as much as 85 percent — the sharpest decline of any group of North American birds. Researchers have long assumed they were most vulnerable while reproducing, so they've focused on the expansion of agriculture, urbanization, energy development and other factors destroying habitat in the birds' northerly haunts. But Arvind Panjabi, my guide and the international program director at the Rocky Mountain Bird Observatory in Fort Collins, Colo., wants to know: What if the Chihuahuan Desert grasslands are equally critical?

In an earlier study of vesper sparrows here, near the northern Chihuahua town of Janos, Panjabi found that only a quarter to a half survived the winter. Those that lived spent more time around tall grass, which is increasingly rare due to over-grazing and drought. At the lower end of that mortality range, sustaining the population would require each vesper pair to raise eight chicks per year, rather than their typical three to four, Panjabi says. And that's excluding predation and die-offs in other seasons.

So besides tracking the survival rates of the sparrows we're after today, Panjabi is trying to identify the features — tall grass, hills — most important to their survival, to make conservation efforts more effective.

Work like Panjabi's is increasingly urgent. Pronghorn, kit fox, badger, mule deer, prairie dogs, Aplomado falcons and golden eagles also rely on these arid grasslands, which have been decimated over the last two decades by drought, overgrazing and sodbusting. When I visit, the roadsides are lined with the bones of starved cows.

Many struggling ranchers have been selling their land to farmers. In central and northern Chihuahua, those are mostly Mexican Mennonites, themselves so pinched by drought and desperate for new land as their wells dry up and their population swells that they have been known to buy ranches for two to three times their value. Once plowed, however, the habitat is nearly useless to wildlife, the grasses' deep roots gone and crucial plant biodiversity permanently lost.

Worse, grassland conversion appears to be escalating in the flat expanses where most birds live. A survey of satellite images of Valles Centrales, a Massachusetts-sized area southeast of

Janos, showed that farmers converted over 170,000 acres — more than 60 percent — of its flat grasslands between 2006 and 2011, and almost 35 percent of all its grasslands. At current rates, flat grasslands will disappear from Valles Centrales by 2025.

In hopes of saving some of what's left, U.S. and Mexican conservationists are trying to help ranchers stay on their land and steward it better through more sustainable grazing practices. But the biggest challenge is reaching the more insular, and influential, Mennonite community. Still, when I talk to Panjabi at El Uno, a 46,000-acre Nature Conservancy-owned ranch near Janos, he's optimistic. "The story is not over," says the bearded 42-year-old mandolin player one night over a dinner of refried beans and menudo, a soup made with beef stomach. "There are still a lot of grasslands."

MENNONITES ARE DESCENDED FROM 16TH-CENTURY Swiss Anabaptists. The conservative sect of Mennonites that eventually settled in Mexico first scattered throughout Europe, then Russia, then Canada, moving frequently to escape religious persecution and searching for places where its members could opt out of military service (they are pacifists) and educate their children in their own schools.

Mennonite immigrants first arrived in Chihuahua in 1922, where they found a tolerant government. They purchased about 250,000 acres of land in Cuauhtémoc, in central Chihuahua, now considered the Mexican Mennonite heartland. Today, about 80,000 Mennonites live in Mexico, with most in Chihuahua, and own some 865,000 acres of land.

At first, they eschewed modern technology, farming with rainwater and traveling by horse and buggy. But in the 1950s, one of the first known Mennonite irrigation systems arrived in Cuauhtémoc, when a farmer installed a center pivot sprinkler on his apple orchards. Each center pivot is capable of watering about a quarter of a square mile, so more Mennonites followed suit. While adoption was initially slow — due both to internal resistance and the steep cost of sinking wells and installing center pivots — the practice escalated in the early 1990s when a savage drought hit the region. Irrigating fields with groundwater became the surest way of making it as a farmer. Grassland conversions soared.

In 2005, when Pedro Calderon was a 20-something bird biologist for the Mexican conservation group Profauna, he witnessed the arrival of industrial agriculture in Valles Centrales. Mennonites purchased over 20,000 acres of ranchlands, then showed up at Profauna's office, explaining that Mexico's environmental police, Profepa, had fined them for clearing the land without contracting for and completing an environmental review to obtain the requisite land-use change

Mist netting for sparrows in the Chihuahuan Desert in northern Mexico, above. Top left, Rocky Mountain Bird Observatory's Arvind Panjabi with a sparrow. SUJATA GUPTA

Above, a Mennonite farmer plows grasslands near Janos, Chihuahua, in northern Mexico. TED WOOD

permit. To clear lands, a developer must pay SEMARNAT, Mexico's equivalent of the U.S. Environmental Protection Agency, about $230 per acre. The penalty for clearing land without a permit can total hundreds of thousands of dollars.

The Mennonites wanted to know if Profauna could help bring them into compliance with Mexico's environmental laws. When Calderon visited the ranch to investigate, he almost cried. Stretching as far as he could see was nothing but deep brown soil. Profauna returned the farmers' money and began urging officials to take heed. "We started writing letters. We tried to talk to the president of Mexico and we talked with the governor of Chihuahua. We did everything to try to inform people about the problem, but the government never listened to us," Calderon says.

So sodbusting continued, vastly in excess of what the government actually issued permits for, according to Alberto Macías Duarte, a wildlife ecologist at Sonora State University, who has been compiling permit data from Valles Centrales.

Many farmers forgo permits because they know that even if they get caught, they can keep clearing land, says Profauna Director Alberto Lafon. If the parcel of land is large enough, the penalty can be cheaper than the clearing fee. Many in the conservation community say that farmers also obtain permits through bribes.

Because most Mennonites in Mexico are educated in low German and finish school around age 12, many cannot read Spanish and may not realize that they aren't going through proper channels, says Marion Meyer, who heads the Mexican office of the Mennonite Central Committee, a global Mennonite outreach organization. Even when they know the process is a farce, Mennonites often feel they have no choice but to pay under the table. "Some of the things we've heard from Mennonites are like, 'You want to go the legal route. And then you request a permit and … you're sitting there waiting six years for your permit.' " SEMARNAT subdelegate Gustavo Hereda declined to comment on allegations of corruption. "It's hard to get the permit because we study each case individually," he says.

Pablo Dominguez, a SEMARNAT official I met at El Uno, told me the agency is too short-staffed to protect such a large area. And because officials can't block ranchers from selling to farmers, they are perpetually behind the action once clearings start. Dominguez recalled an incident where farmers near Janos cleared grasslands containing endangered prairie dog habitat. It was too late to do anything, he says, "so we fined them and let them continue."

Meanwhile, thanks to drought, intensive grazing and industrial farming, the region is rapidly running out of water. Mexico's national water commission, ConAgua, recently calculated that groundwater is being pumped from the Janos region faster than it can recharge.

Juan Harms, an overall-clad bear of a man whose front teeth are lined with silver, is hoping to expand his 130-acre sorghum, pepper, oat and wheat farm in Buenos Aires, a Mennonite community near Janos. But the four wells he's drilled have come up dry; each cost $15,000. Harms is surprisingly unruffled. "I hope for better luck next time," he says in Spanish, through a translator. When asked what Buenos Aires residents will do if the water dries up, he simply says that the resources "can't run out." It's not hard to see why he feels that way: When you look past his fields and John Deere tractors gleaming in the sun, out across the prairie at the confluence of sky and the Sierra Madre, the earth here does feel boundless.

EVEN IF ENFORCEMENT OF EXISTING REGULATIONS governing land-use change were perfect, grassland conversion would likely continue. There is no legal definition of grasslands and no Mexican environmental laws or programs explicitly protect them.

For now, Calderon — who's now a contract biologist with the Rocky Mountain Bird Observatory — and other conservationists are helping ranchers take advantage of more general programs, hoping to both improve the quality of remaining grasslands and prevent sellouts. Because these grasslands co-evolved with wild grazers, carefully managed cattle can actually benefit the ecosystem.

I meet Angel Martinez, a 47-year-old rancher, outside his modest house in the town of Casa de Janos. Clad in jeans and a baseball cap, Martinez hops into our pickup to show us his 3,500-acre ranch. The land, called an *ejido*, is held communally by 16 ranchers, or *ejidatarios*. Since 2010, after a university researcher helped the *ejidatarios* with an application, it has been enrolled in a federal payment-for-ecosystem-services program wherein officials calculate the ecological value of a natural resource and then pay its owner a fair wage to conserve it. The grass here is a billowy blue-green and thick as a horse's mane.

Martinez explains through a translator that each *ejidatario* receives about $1,300 annually to graze seven instead of 20 cows. Because their calves are now fatter and sell for more money, the *ejidatarios* earn more than in previous years. Martinez boasts that his *ejido* has avoided the drought's worst ravages. His neighbors, meanwhile, "have a lot of dead cows."

But few ranchers even know about this program, which in 2010 doled out about $88,000 to protect almost 1.3 million acres of land. Limited funds also keep its reach small: When Martinez's group applied, only 16 out of 85 applicants were accepted because money was short. Theirs was the only grassland. Existing conservation programs tend to focus on forests. A government sign posted on Martinez's ranch reads *Derribar arbolado*: Don't cut down the trees.

Hoping to help fill the gap, The Nature Conservancy purchased El Uno Ranch in 2005 to serve as an outdoor laboratory for grassland restoration and sustainable grazing experiments. The group imported 36 bison from Wind Cave National Park in South Dakota to reintroduce natural grazers. More recently, it started a grass-banking program, letting local ranchers graze their cattle on almost 8,500 acres of El Uno while allowing their own pastures to recover.

Such advocacy is paying off. In 2009, the Mexican government decreed 1.3 million acres of the Janos region a UNESCO biosphere reserve — the first official protection for grasslands in the country. Digging new wells or clearing grasslands within its borders is now illegal.

Outreach to Mennonites has been more difficult than other efforts, but there has been some progress. Profauna's Lafon has, through a laborious trust-building effort, convinced some farmers that consulting with environmentalists is in their financial interest. About five years ago, Lafon began working with Mennonites who had purchased 22,000 acres of grassland in Valles Centrales. He measured groundwater levels after they sunk each well, and by the seventh — after they had cleared only 1,200 acres — he told them they were on the verge of running out of water. "I went to meeting after meeting after meeting with them," he says, before the leaders agreed to stop the project. He hopes to eventually get all local farmers to approach Profauna for advice before clearing new land.

Panjabi, meanwhile, has been working with the World Wildlife Fund Alliance to obtain an approximately $140,000 grant through it and the Carlos Slim Foundation. If it's approved, part of that money will go toward working with Mennonites to reduce pesticide and water use. Some Mennonites have also begun taking out loans on their own to cover more efficient drip-tape irrigation systems, which use half the water of center pivots.

Soon after my visit with Harms, he brings his family and some friends to El Uno. We stand chatting along the dirt road as the biologists bring over some sparrows that have recently been freed of their transmitters. Harms, his wife and his son each cradle a bird in their hands for a moment before releasing it skyward. As hers takes flight, Harms' wife lets out a small laugh.

BACK AT THE NET, the research team closes in on Frequency 227, who has managed to dodge capture several times. Catching a single bird can take hours or days, assuming, of course, that it's still alive. Erin Strasser, the field crew leader, tells me that they have found transmitters atop a pile of feathers, buried underground, and inside an owl pellet. Finally, the exhausted bird snags and the biologists let out a whoop.

Seated in the driver's side of a Nature Conservancy pickup, Strasser records Frequency 227's vitals: 19.4 grams and a fat score of 3 out of a possible 6 — it's in pretty good shape. Strasser steps out of the truck and bids the bird farewell. "It's been a good run," she says. "Hope to see you again next year." Frequency 227 flies low and then drops out of sight into a patch of grass. □

Sujata Gupta, a freelance science writer based in Burlington, Vt., writes about the environment, health and food. Check out her writing at sujatagupta.com.

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Technicians scan for birds, above. Above right, RMBO's Erin Strasser and a Mennonite woman release a grasshopper sparrow. DENIS PEREZ/RMBO, LEFT; SUJATA GUPTA, RIGHT