

A rattlesnake-toting badger walks beside the steel-slatted wall being built along the border between the United States and Mexico. The wall disrupts animals' movements in profound ways, but for those small enough, sporadic narrow openings offer passage.



THE MISSION TO KEEP THE BORDERLANDS WILD

In the rugged terrain where Mexico and the United States meet, a border wall is just the latest obstacle fragmenting habitats and disrupting migration paths. Here's how a cadre of conservationists is trying to get animals moving.

PHOTOGRAPHS BY
JAIME ROJO



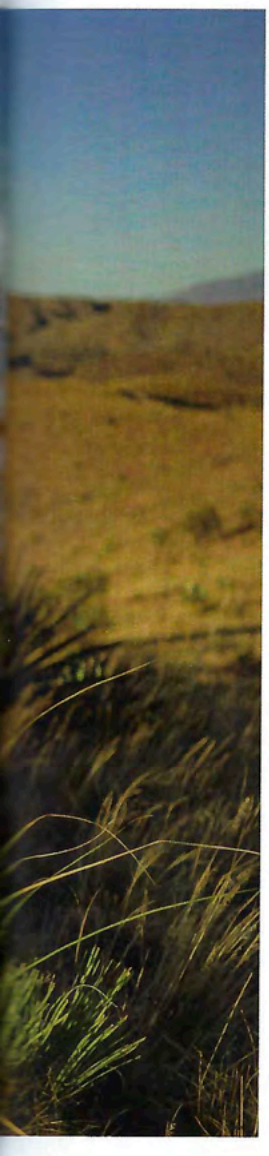


Rivers and streams carve crucial corridors for wildlife among the mountain ranges known as the Sky Islands, which straddle Arizona, New Mexico, and the Mexican states of Sonora and Chihuahua. Here, the Cajón Bonito River threads across Sonoran highlands managed by the nonprofit conservation organization Cuenca los Ojos.



TO APPRECIATE HOW the Madrean Sky Islands earn their nickname, it helps to imagine the hawk's-eye view. Looking down over the borderlands that stretch out across Arizona, New Mexico, and the Mexican states of Sonora and Chihuahua, you would see a wide swath of desert scattered with more than 50 small, rugged mountain ranges: an archipelago of green on either side of the international border.

These high-country oases help make the Sky Islands region one of the world's most spectacularly biodiverse, a place where a fleet-footed mammal might wander among five different biomes in a day, from dusty desert scrub to lush pine and fir forests. And for millennia, wild creatures of all sorts—javelinas and pronghorn, coyotes and ocelots, black bears and jaguars—have moved across this



The nonprofit National Geographic Society, committed to illuminating and protecting the wonder of our world, funded the work of National Geographic Explorers Jaime Rojo and Ganesh Marín featured in this story.

Today's borderlands conservationists—like Valerie Gordon (at left), executive director of Cuenca los Ojos—build on tradition. In the 1980s, Gordon's mother, Valer Clark (at right), began rehabilitating habitat on her Arizona ranch, using stone erosion-control structures to capture floodwaters that would otherwise scour the land. She founded Cuenca, as it's known, to apply her permaculture techniques more broadly. The organization now manages vast acres of once degraded Sonoran rangelands, home to newly reintroduced species like beavers and bison, along with jaguars and other predators. Rewilding the border helps counter the narrative of "a forbidding place," Gordon says. "It is a vibrant place that is resilient and spectacularly beautiful."

land by following the ridgelines and waterways, a network of cool, wet corridors where vegetation thrives. From above, it's easy to trace these timeworn routes, green ribbons against the tawny earth.

You would also notice intrusions. Roads and highways. Irrigated farm fields. Ranch fences stretched across rangelands where grazing and erosion have stripped the soil. And along the international border, the patchy black line of an immense wall, some 250 miles of which have been built through the heart of the Sky Islands since 2017.

All of these are potential interruptions to the ancient arteries that lead animals through the borderlands—routes that photographer and National Geographic Explorer Jaime Rojo knows well. A former project director for a Mexican conservation organization, Rojo has spent the past two years documenting the myriad ways that human development fragments wildlife habitat in the Sky Islands, disrupting animals' annual and seasonal movements and hindering access to food, water, and mates.

Along the way, he has also seen firsthand how a remarkable coalition is working on both sides of the border to preserve and restore the region's ecological integrity. It's a group that includes scientists monitoring the limited wildlife passages in the border wall, private ranchers reintroducing native plants and animals to their lands, and Indigenous leaders reclaiming stewardship of sacred and ancestral territory.

Among the defenders are pioneers like Valer Clark, 85-year-old founder of the nonprofit Cuenca los Ojos, who has spent decades stacking rocks in dusty washes, repairing streambeds, and restoring vegetation on erosion-scarred ranchlands. Also researchers like National Geographic Explorer Ganesh Marín, who has logged countless backcountry miles installing motion-sensing wildlife cameras and gathering vital data about the movement patterns of animals like black bears, javelinas, and elusive jaguars.

"They are all pragmatic and realistic," Rojo says, "and their common thread is that they are all in love with the Sky Islands."

Today, as construction continues on a border wall that already bisects much of the region, many of these partners find themselves more separated than ever—and seeking new ways to collaborate to ensure some of the continent's oldest animal migrations don't vanish completely. –BRIAN KEVIN



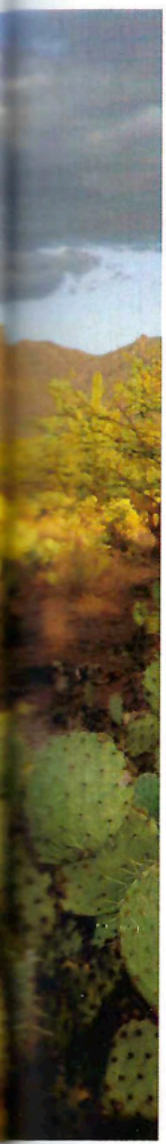


Exploring a creekside corridor on Cuenca's ranchlands, these white-nosed coatis are nearing the northern edge of their distribution. "One of the beauties of the Sky Islands is it's where species reach the extremes of their range," says Eamon Harrity, a wildlife specialist with the nonprofit Sky Island Alliance, meaning unlikely species mingle. But as border wall construction continues, some researchers worry Arizona's coatis could be cut off from the bulk of the population in Mexico and Central and South America.

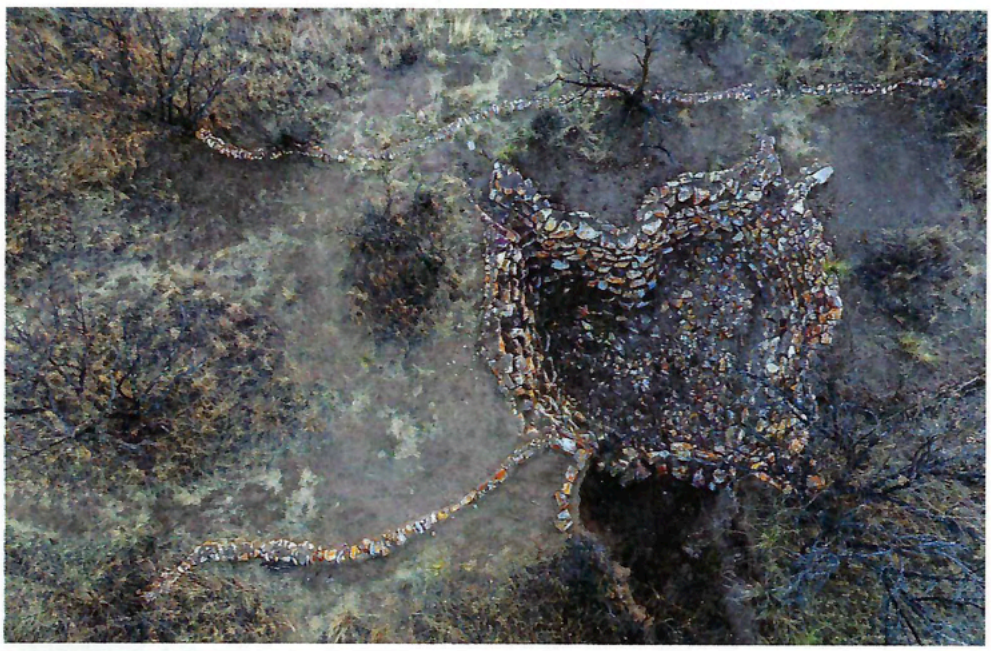


Verlon Jose (above), chairman of the Tohono O'odham Nation, recently signed an agreement with U.S. officials that permits the tribe to co-manage Arizona's Baboquivari Peak Wilderness Area. A site sacred to Jose's people, it's part of an invaluable wildlife corridor and designated critical habitat for jaguars. The southern boundary of the Tohono O'odham Reservation follows the international border, 62 miles marked only by a low vehicle barrier that poses little hindrance to animals. Tribal members live on both sides.

Elsewhere in the borderlands, more intensive land uses threaten natural resources. Large-scale farms, like these in Chihuahua, Mexico (top right), depend on irrigation, taxing scarce groundwater resources. By contrast, volunteers for Arizona's Borderlands Restoration Network have built thousands of rock and wood structures to help restore watersheds—such as what's called a Zuni bowl (bottom right), which slows the flow of water, preventing erosion and helping moisture penetrate soil.





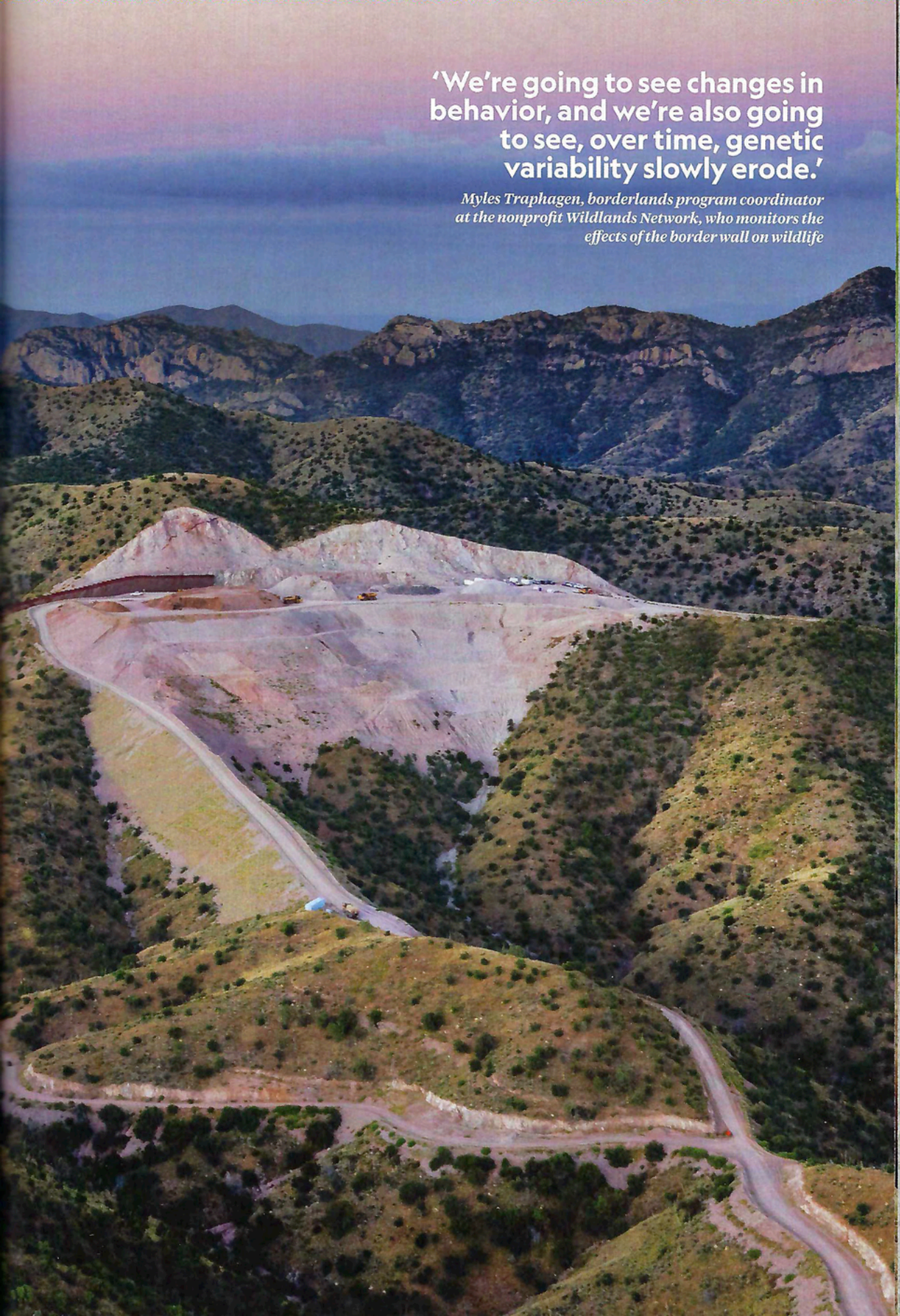


‘Sometimes I see these rock structures as art designed to disappear.’

Rodrigo Sierra Corona, executive director of Borderlands Restoration Network, which repairs eroded landscapes using permaculture features that sediment will collect around, allowing vegetation to take hold



In Arizona's Pajarito Mountains, work was abandoned on a section of wall in 2021—but not before a construction staging area was carved into the landscape. Department of Homeland Security (DHS) officials announced plans last year to complete the segment.



'We're going to see changes in behavior, and we're also going to see, over time, genetic variability slowly erode.'

Myles Traphagen, borderlands program coordinator at the nonprofit Wildlands Network, who monitors the effects of the border wall on wildlife

Desert travelers photographed using doggie doors on Cuenca lands include (clockwise from right) raccoons, rats, skunks, javelinas (also on flap), gray foxes, bobcats, mountain lions, and coyotes. Camera traps were placed with assistance from Sky Island Alliance.





CAN 'DOGGIE DOORS' HELP ANIMALS CROSS THE BORDER?

Smaller animals might pass through the border wall using openings, about the size of a standard sheet of paper, that some have likened to doggie doors. Border officials say over 50 such openings were installed across Arizona between 2017 and 2020, with more added since. Eamon Harrity, who monitors wildlife crossings for the Sky Island Alliance, says his organization counts 30 along some 150 miles of border in the Sky Islands region.













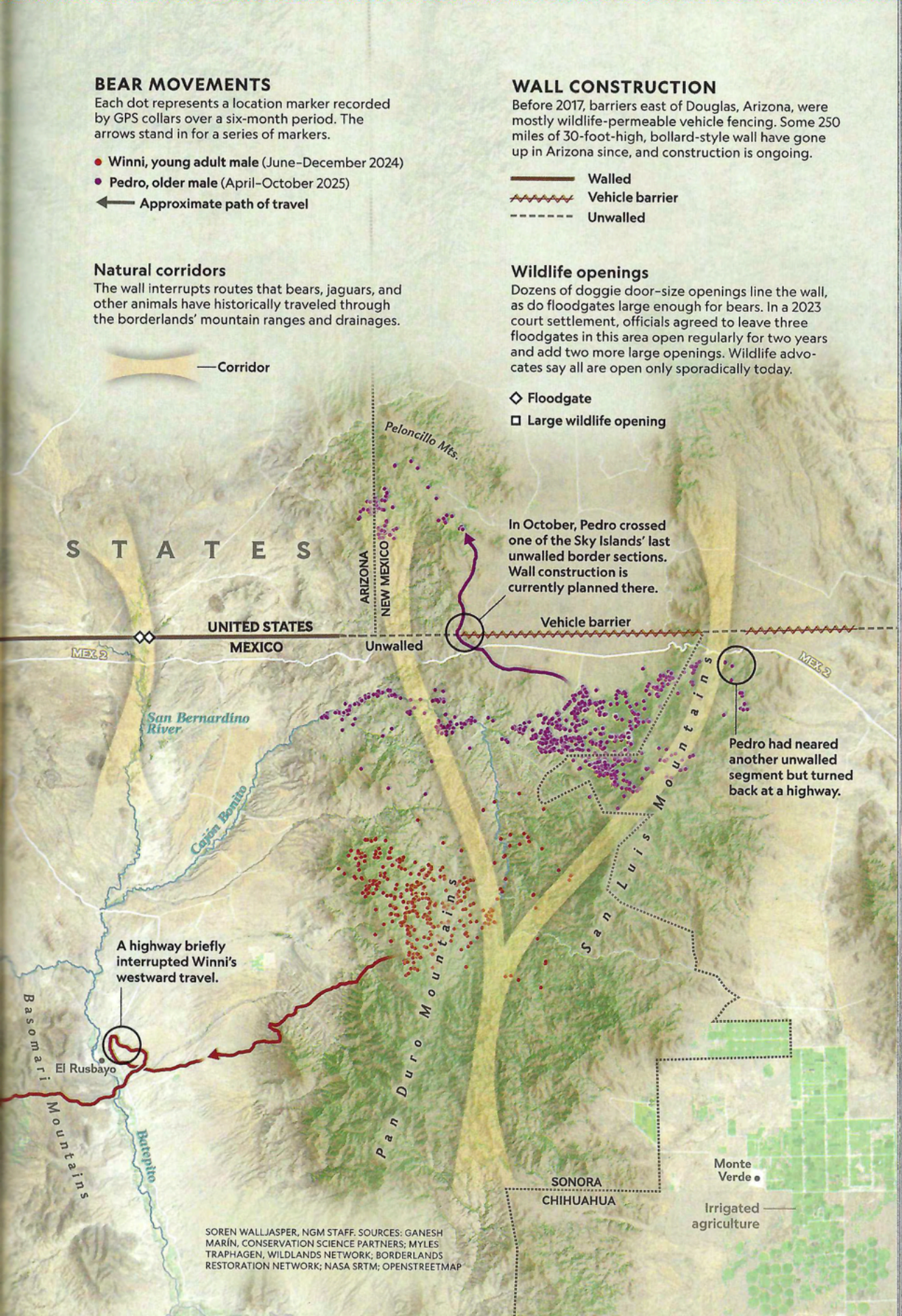


Wildlife ecologist and National Geographic Explorer Ganesh Marín affixes a GPS collar to a tranquilized black bear, alongside veterinarian Susana Ilescas (at left) and wildlife technician Paige Satterfield. Marín's tracking project shows how bears interact with roads, fences, and the border wall.

HOW OBSTACLES HINDER WILDLIFE MOVEMENT IN THE BORDERLANDS

For larger mammals like black bears, which cover vast areas in search of food and mates, the border wall is simply the most conspicuous of the barriers that might prevent travel along the streams and ridgelines of the Sky Islands. Other human-made obstructions, such as roads and ranch fences, can also be restrictive, as shown by the movements of two GPS-collared black bears tracked by National Geographic Explorer Ganesh Marín.




BEAR MOVEMENTS
Each dot represents a location marker recorded by GPS collars over a six-month period. The arrows stand in for a series of markers.
Winni, young adult male (June–December 2024)
Pedro, older male (April–October 2025)
Approximate path of travel
WALL CONSTRUCTION
Before 2017, barriers east of Douglas, Arizona, were mostly wildlife-permeable vehicle fencing. Some 250 miles of 30-foot-high, bollard-style wall have gone up in Arizona since, and construction is ongoing.
Walled
Vehicle barrier
Unwalled
Natural corridors
The wall interrupts routes that bears, jaguars, and other animals have historically traveled through the borderlands' mountain ranges and drainages.
Corridor
Wildlife openings
Dozens of doggie door–size openings line the wall, as do floodgates large enough for bears. In a 2023 court settlement, officials agreed to leave three floodgates in this area open regularly for two years and add two more large openings. Wildlife advocates say all are open only sporadically today.
Floodgate
Large wildlife opening
Peloncillo Mts.
STATES
ARIZONA
NEW MEXICO
In October, Pedro crossed one of the Sky Islands' last unwalled border sections. Wall construction is currently planned there.
UNITED STATES
MEXICO
Unwalled
Vehicle barrier
MEX 2
MEX 2
San Bernardino River
Cajón Bonito
San Luis Mountains
Pedro had neared another unwalled segment but turned back at a highway.
A highway briefly interrupted Winni's westward travel.
El Rusbayo
Basomari Mountains
Batepito
Pan Duro Mountains
SONORA
CHIHUAHUA
Monte Verde
Irrigated agriculture
SOREN WALLJASPER, NGM STAFF. SOURCES: GANESH MARÍN, CONSERVATION SCIENCE PARTNERS; MYLES TRAPHAGEN, WILDLANDS NETWORK; BORDERLANDS RESTORATION NETWORK; NASA SRTM; OPENSTREETMAP



This GPS-collared black bear, nicknamed Pedro, was photographed with a camera trap in northern Sonora. For more than a year after Marín began tracking him in July 2024, Pedro hesitated to cross a highway near the border. Last fall, he lumbered across the road and into western New Mexico, crossing an unwalled area of the Peloncillo Mountains. DHS has plans to wall off the section.





Conservation-oriented private ranches, like Arizona's Cienega Ranch, are an integral part of wildlife corridors in the borderlands, linking preserves and public lands. Wildlife technician Scott Patrick (above) releases a kit fox at Cienega, where ranch owner Josiah Austin has also reintroduced black-tailed prairie dogs and burrowing owls.

Survey flights help Borderlands Restoration Network's Rodrigo Sierra Corona (top right, with pilot Chuck Schroll of the conservation flight organization LightHawk) identify ranchers and other landowners with whom his organization might partner. That work could include reintroducing native flora to an overgrazed landscape. Francesca Claverie (bottom right) directs Borderlands Restoration Network's native plant program, which grows more than 100,000 plants a year for both restoration programs and home gardening and landscaping.







'I make a lot of mistakes, but I think, in the long run, what I'm doing will be beneficial for generations to come.'

Rancher Josiah Austin, who has spent more than 30 years restoring wetlands and reintroducing native species on what's now nearly 70,000 acres in Arizona



'We don't have enough love letters to the land. You think of Yellowstone—plenty of love letters. Or Yosemite, the Smokies, Banff. But *this* place deserves the kind of emotions that other great places give you.'

Rodrigo Sierra Corona, executive director of Borderlands Restoration Network



Construction is underway on some 27 miles of border wall through the San Rafael Valley, one of the Sky Islands' last unwalled wildlife corridors, a sprawling grassland patchwork of public lands and private ranches. A jaguar spotted on several southern Arizona trail cameras last summer is thought to have crossed the border here.