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May 11, 2010

To Help Jaguars Survive, Ease Their Commute

By [ELISABETH ROSENTHAL](#)

LAS LOMAS, Costa Rica — Héctor Porrás-Valverde tried to adopt a Zen attitude when he discovered recently that jaguars had turned two of his cows into carcasses.

The jaguars' numbers may have dwindled, but they still roam the forests here in eastern [Costa Rica](#), making their presence known by devouring the occasional chicken, pig or cow.

"I understand cats do this because they need to survive," said Mr. Porrás-Valverde, 41, a burly dairy farmer.

A few years ago, he acknowledged, his first reaction might have been to reach for a gun. But his farm now sits in the middle of land that Costa Rica has designated a "jaguar corridor" — a protected pathway that allows the stealthy, nocturnal animals to safely traverse areas of human civilization.

In the past few years, such [corridors](#) have been created in Africa, Asia and the Americas to help animals cope with 21st-century threats, from encroaching highways and malls to [climate change](#).

These pathways represent an important shift in conservation strategy. Like many other nations, Costa Rica has traditionally tried to protect large mammal species like jaguars by creating sanctuaries — buying up land and giving threatened animals a home where they can safely eat, fight and breed to eternity.

But in the past decade or so, scientists have realized that connecting corridors are needed because many species rely for survival on the migration of a few animals from one region to another, to intermix gene pools and to repopulate areas devastated by natural disasters or disease. Placing animals in isolated preserves, studies have found, decreases diversity and risks dulling down a species — like preventing New Yorkers and Californians from getting together to

procreate.

“It was kind of an epiphany,” said Alan Rabinowitz, a zoologist who is president of **Panthera**, an organization that **studies** and promotes conservation of large cats. “We were giving them nice land to live on when what they were doing — and what they needed — was an underground railway.”

He said critical migration routes were especially vulnerable in rapidly developing countries, where new roads, shopping malls, dams, playgrounds and subdivisions could spring up overnight, blocking the animals’ passage. To correct this oversight, Costa Rica and other countries have begun identifying and protecting corridors for jaguars and other large mammals, like tigers, snow leopards and pandas.

Most of the corridors are not obviously demarcated pathways, but virtual trails, “protected” in the sense that builders and planners are not permitted to introduce obstacles to the animals’ movements through the area.

The idea is not to stop building entirely, but to adjust development so that animals can move through landscapes that humans also occupy. A tall fence surrounding a shopping mall may be forbidden, for example, or a two-lane road may have to be substituted for a proposed four-lane highway.

Local residents must also be persuaded not to shoot wild intruders or otherwise drive them away when they are in transit, a shift in thinking that is already taking root here.

“Of course jaguars sometimes have conflicts with communities, but now people have been educated to change their thinking — not to see them as so dangerous,” said Víctor Fallas Ramírez, an agronomist who grows ornamental plants here.

The threat of global warming has added to the urgency of creating corridors because animals will need to shift habitats as temperatures rise from climate change.

“This is an idea that people are finding very compelling, and especially compelling now because with changing climate, species will need the capacity to move,” said **Norman Christensen**, a professor of ecology at **Duke University**, whose team is working to define corridors in Central America, India and Africa.

While Dr. Christensen called Costa Rica “the poster child” for its efforts, he said corridors for large mammals were also being created in places like Uganda and China. The **World Bank** is financing corridor projects in **Brazil** and **Peru**; more important, the bank’s transportation planners are working with conservationists to ensure that building highways and laying train

tracks so humans can move freely does not destroy that movement for animals, Dr. Christensen said.

Part of the reason that conservationists had in the past focused exclusively on preserves was that there was a lack of good data on the travel and breeding patterns of large animals like jaguars; these big predators favor dense jungles and are nocturnal and extraordinarily shy.

So when new techniques allowed scientists to take a first look at the jaguar genome a decade ago, they were shocked to discover that jaguars from the northern reaches of Mexico had exactly the same genetic makeup as those from the southern tip of South America.

That meant that over time, some jaguars were moving up and down the Americas to breed; otherwise, the isolation of jaguar populations in different regions would have caused their genetic makeups to diverge. At least some males from Colombia were traveling to Panama to mate, and others were moving from Mexico to Belize.

“It was surprising, but it seemed to say they had one continuous habitat,” said Dr. Rabinowitz, the zoologist.

Scientists were convinced that jaguars would never cross a water barrier as wide as the Panama Canal, smack in the middle of their extended habitat. But when they set up cameras to spot jaguars near the canal, they discovered that, every so often, a brave animal took the plunge, ensuring the continuity of genes in the north and south.

Costa Rica now requires developers to consider whether a new construction project would interrupt an essential corridor, or else to make other arrangements for jaguars to travel safely through the area.

The fact that jaguars and other large cat species travel at night and do not hunt when they are on the move makes it easier for them to co-exist with humans.

“The bottom line is big cats can live with people,” Dr. Rabinowitz said. “That’s not true of all animals.”

He continued, “The problem with the paradigm of conservation is it’s been seen as a confrontation between nature and development, that won’t let progress happen.”

In Costa Rica, Panthera is conducting research to better define the routes taken by jaguars and lobbying politicians and developers to respect them. The organization also sponsors community outreach programs to resolve what the researchers term “jaguar conflict issues.”

“Many places don’t want the corridors,” said Roberto Salom, Panthera’s regional coordinator here. “We’ve made alliances with lots of leaders and educators, but it’s a very slow process.”

Here in the jungles of Central America, jaguars are regarded as mystical and dangerous. According to local legend, indigenous people turn into jaguars when they enter the jungle, and then shake off their spots when they return to the village.

“I’ve seen the tracks, but never an animal,” said Enoc Bajo Chiripó, an indigenous leader who is working with the group. “But you can smell when they’re around.”

Families in the region tell jaguar stories the way New Yorkers talk about their families’ arrivals at Ellis Island.

“My grandmother saw it at the place where agouti and peccaries come to eat,” said Jordi Ortiz-Camacho, 12, speaking of a jaguar. “My grandfather killed it with a stick because his gun didn’t work.”

While local farmers are now willing to forgive a dead cow or two to allow jaguars to survive as a species, they are often reluctant to make larger sacrifices. Just outside Las Lomas, a proposed [hydroelectric](#) project would involve building a huge dam across a valley, creating a body of water a third of a mile wide and more than three miles long. As planned, it would block a jaguar corridor.

The new project will mean jobs, an increase in property values and improved basic services for the area, including roads and piped water, said Mr. Fallas Ramírez, the agronomist. And the community, he said, cannot just forsake all that.

“For us, and the jaguars, it’s just an obstacle,” said Mr. Salom, the biologist, who is looking into alternative solutions, like an animal bridge or a smaller dam. “So we’re thinking, ‘How can we mitigate this?’ ”