



H O T S P O T S
PRESERVING PIECES OF A FRAGILE BIOSPHERE

The Rain Forest in Rio's Backyard

Brazil's Atlantic forest rivals the Amazon with its eye-popping array of unique plants and animals, yet its proximity to Rio de Janeiro and other cities puts it at even greater risk. Now scientists are testing an approach to answer the question: Can a rain forest be brought back to life?

BY VIRGINIA MORELL

PHOTOGRAPHS BY MARK W. MOFFETT

LEFT: BRACHYCEPHALUS DIDACTYLUS (FLEA FROG) BELOW: BEGONIA SANTOSLIMAE BRADE

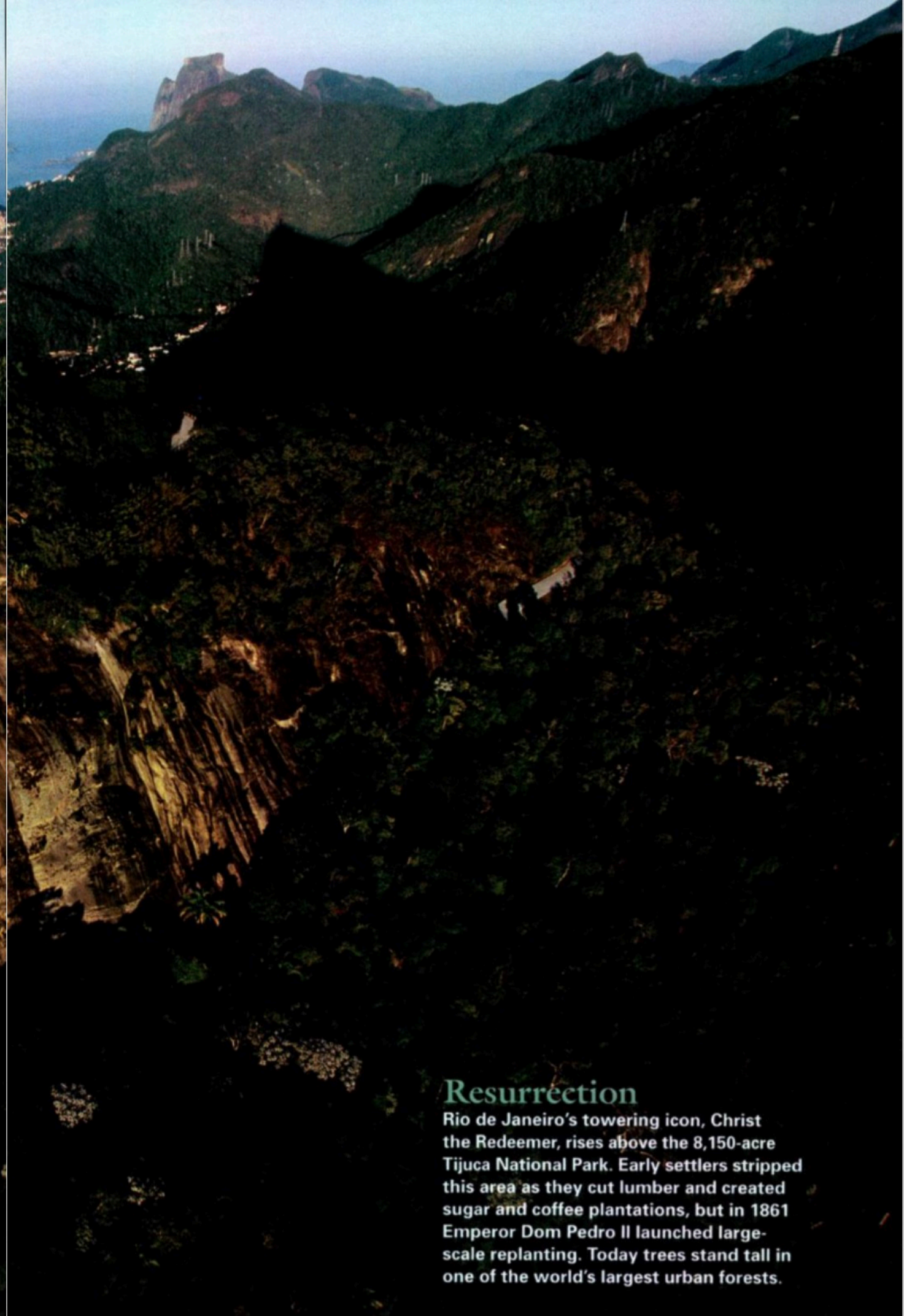




Squeezed Tight

Native to the now fragmented forests in the state of Bahia, a golden-headed lion tamarin with a radio collar stretches out in the forest canopy. Scientists who track this endangered species believe its survival may hang on creating forested corridors to link the scattered patches of its habitat.

LEONTOPITHECUS CHRYSOMELAS (GOLDEN-HEADED LION TAMARIN)



Resurrection

Rio de Janeiro's towering icon, Christ the Redeemer, rises above the 8,150-acre Tijuca National Park. Early settlers stripped this area as they cut lumber and created sugar and coffee plantations, but in 1861 Emperor Dom Pedro II launched large-scale replanting. Today trees stand tall in one of the world's largest urban forests.



“It’s always like this,” says Adriano Chiarello. “You know they’re here, but you can’t see them.” The Brazilian conservation biologist bends his neck backward like a yoga master to peer at a tree’s uppermost branches a hundred feet above us. Somewhere in the leafy canopy, a female maned sloth and her eight-month-old infant are hidden from view. A steadily beeping radio signal from the mother’s collar has brought Chiarello to the base of the tree, but even technology has its limits. The biologist must now spot the pair the old-fashioned way: with his eyes alone.

“If they don’t move, we may never see them,” Chiarello sighs. “And you know, they really are sloths. They spend hours sitting, sleeping, never moving. That’s what they do 80 to 90 percent of the day: nothing.”

He wipes his eyes, shakes his head, then returns to his craning yoga pose. “Wait. . . Maybe my insult has worked. Look there—right over your head. She’s braced against a branch.”

I follow Chiarello’s pointed finger and spy the mother’s dark brown face among the leaves. She buries her face under her arm and looks instantly like a large, furred coconut or bees’ nest.

“Do you see that? How she can vanish?” Chiarello asks. “For their size, they are so well camouflaged. And . . . wow! Now she’s moving!”

For Chiarello, such a sloth-on-the-move sighting is a peak experience, the ultimate biological

moment that holds the promise of new insights.

The baby sloth, looking like a Teletubby wearing a curly lambskin coat, emerges from its mother’s arms. It climbs over her and then playfully—lazily—slaps at its mother’s face. The mother does nothing in return. “They never respond to their babies,” whispers Chiarello, adding that mother sloths neither play nor get angry with their offspring. Instead, with all the speed of a desert tortoise, the mother reaches an arm out to a nearby branch and nibbles the leaves.

Chiarello’s graduate students—at the Catholic University of Minas Gerais, where he’s a professor—busily take notes. We all stretch our necks, craning this way and that, to keep the sloths in view as the pair move like sleepwalking high-wire artists along the branches to the freshest leaves. Astonishingly, given the mother’s 15-pound build, she and her baby hang from the pencil-thin twigs like strange, half-animated fruits.

Chiarello’s “main actress,” as he fondly refers to the mother sloth, is the star in his study, funded in part by the National Geographic Society, of the endangered mammals of the São Lourenço Municipal Park, a small fragment of Brazil’s Atlantic forest, or Mata Atlântica as the Brazilians call it. Like many mammals here, the maned sloth has lost huge tracts of its original habitat since the first Portuguese mariners stepped ashore in April 1500. At that time the Mata Atlântica is believed to

HOTSPOTS

The Earth’s richest and most threatened reservoirs of plant and animal life

ATLANTIC FOREST

AREA 35,500 sq mi

HABITAT TYPES

Tropical and subtropical forests on coastal plains, foothills, and mountain slopes up to 6,500 feet

FLAGSHIP SPECIES

Lion tamarins, maned sloth, miqui monkeys, Alagoas curassow, araucaria tree

ENDEMIC SPECIES

8,000 plants, 188 birds, 90 mammals, 60 reptiles, 340 amphibians

PRINCIPAL THREATS

Agriculture, urbanization, industrial pollution, hunting, and collecting

Threadbare Shawl of Green

Covering less than 7 percent of its original 520,000 square miles, the Atlantic forest lies besieged by human sprawl yet still harbors a staggering variety of life. One study found more than 450 tree species—a larger number than in all of Germany—in just two and a half acres.

have covered about 520,000 square miles, making it about one-fifth the size of the present Amazon forest 500 miles to the northwest. The rain forest hugged the coastline from the country’s snout-like protuberance of what is today the state of Rio Grande do Norte to its border with Uruguay. In some places it extended inland for 300 miles or more, covering a range of habitats from coastal mangrove thickets to mountain massifs averaging 3,000 feet high, blanketed with broad-leaved evergreens and conifers.

Forebodingly, one of the first things the Portuguese seafarers did was to chop down a tree. They fashioned a cross from it and celebrated a Mass, claiming the land and its forest for their God and king. Over the next 500 years many more trees were felled, and the forest was transformed into cities, mines, and fields planted with sugarcane, coffee, cacao, and eucalyptus—all introduced species. Now, some 70 percent of Brazil’s population lives in what was once the Atlantic forest, with most people concentrated in two of the three largest cities in South America, São Paulo and Rio de Janeiro.

Given that history of destruction, it’s not surprising that today less than 7 percent of the Atlantic forest remains, much of it in isolated patches, some less than six acres in size. It’s as if someone broke apart a strand of pearls, then stepped on each bead. Indeed, among biological hotspots—the environmentally threatened regions of the world with the highest amount of endemism, meaning species found nowhere



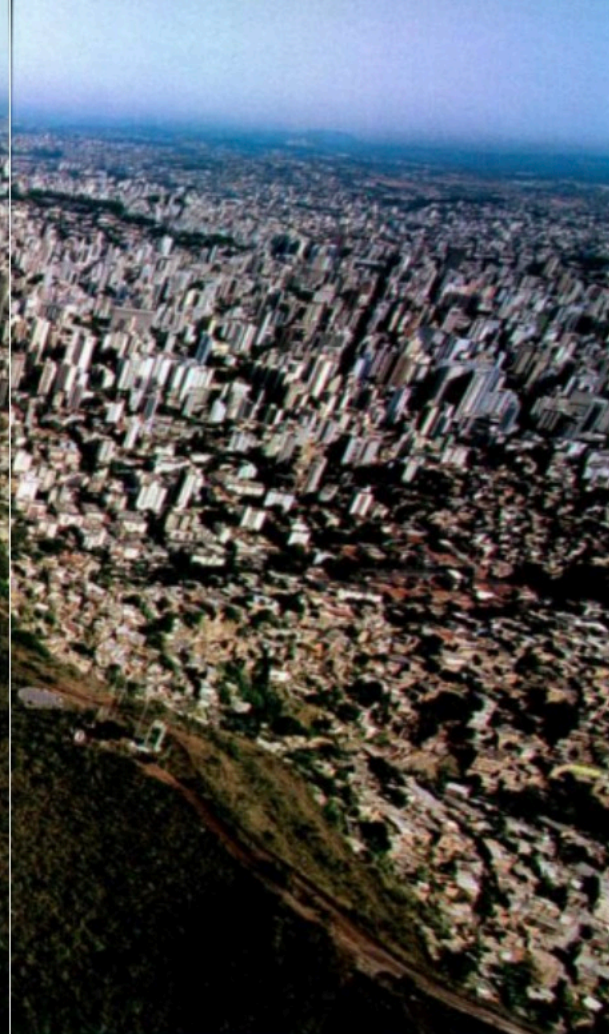
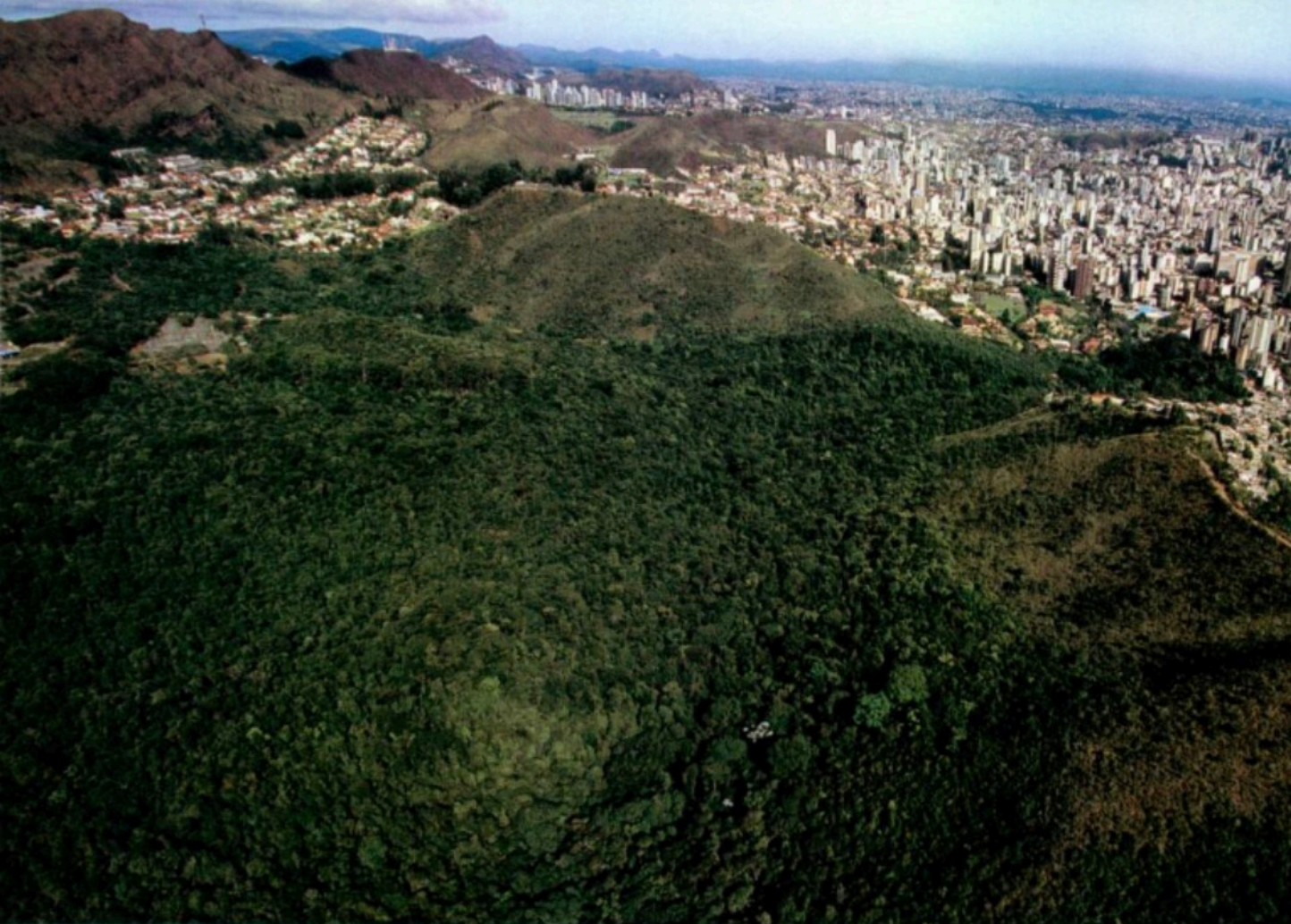
else on the planet—Conservation International ranks the Atlantic forest as one of the top five.

Yet within those fragments many of the Mata Atlântica’s unique species, including some of the world’s rarest plants, birds, and other animals, have managed to survive. Among them is the maned sloth. Like other mammals stranded here on forested islands amid a sea of agriculture and development, the sloth seems doomed to genetic inbreeding—if not eventual extinction.

“We think the sloths’ genetic variation has already decreased,” Chiarello says. “In the past this population was connected to those in southern Bahia and northern Rio de Janeiro. But they’ve been separated for at least 50 years.” To determine the amount of inbreeding in the three groups, one of Chiarello’s students, Paula Lara Ruiz, has launched a study of their genetic makeup.

“We may need to relocate some sloths to maintain their viability,” Chiarello says. “Before we can do that, we need to know what trees they prefer, how much deep forest they need to survive.”

But nailing down the particularities of sloths is only a small part of what Chiarello has in mind. Like other biologists tracking species in the Mata Atlântica, he has a far grander vision. Never mind that some of the land around the fragmented forest has the look of an abandoned bombing range, or a Sahara-in-the-making. Never mind that farmers continue to expand their eucalyptus and coffee plantations. Chiarello and a growing coterie of conservationists are



Big Losses

Skyscrapers tower in place of trees in Belo Horizonte, Brazil's third largest city, where the population has exploded from 385,000 in 1950 to more than four million today. A park holds the line against expansion to the south (left). In Espírito Santo, stacked eucalyptus logs await pickup. Plantations of this non-native species have replaced 7.5 million acres of forest, becoming the world's biggest source of eucalyptus pulp for paper.

determined to bring back the Mata Atlântica by reconnecting as many fragments as they can.

By linking islands of natural landscapes with corridors of vegetation, these scientists believe the Atlantic forest can be partly restored and many of its species saved from extinction. The corridors, in essence, could provide a safe passage from one island to the next, enabling isolated populations of animals and birds to meet and mix. It's an idea that has been around since the 1960s. Although there's no absolute proof that corridors ensure a species' survival, they are currently being tested around the world, with projects under way in the Netherlands, Australia, the United States, and many other countries. "It just makes intuitive sense that corridors are beneficial," says Hugh Safford, an ecologist with the U.S. Forest Service who has worked extensively in the Mata Atlântica. "Any planting to restore a forest has to help."

In Brazil one goal is to develop a corridor that would link broken bits of forest along 500 miles of southeastern coastline, including both new forest and existing agriculture. Though native trees are preferable, just about any type of tree or shrub can be incorporated into a corridor. "Animals use the coffee and eucalyptus plantations to get from one fragment to another," says Chiarello's colleague and fellow mammalogist, Marcelo Passamani. Conservationists want farmers and ranchers to maintain plantings they already have and to join these with replanted stands of native trees. But is it really possible to bring back a rain forest?

"Theoretically, it can be done," says ecologist Rejan R. Guedes-Bruni, coordinator of the Atlantic Forest Program at the Botanical Garden of Rio de Janeiro. Every year since 1993, the Botanical Garden has

(Continued on page 16)





Last Stand?

For more than a million years a primitive amaryllis has brightened mountainsides now just 30 miles removed from Rio de Janeiro. Weeks after this photo was taken, a farmer's fire charred this site, wiping out 40 percent of the species. "It's an interesting question," says Gustavo Martinelli, a scientist at Rio's Botanical Garden Research Institute. "The species has endured on a geologic timescale. Can it survive modern civilization?"



BRADYPUS TORQUATUS (MANED SLOTH)

SMALL VICTORIES

Help arrived just in time for animals pushed close to extinction as their habitat all but disappeared. Roberto Azeredo (below), president of an institute that breeds Alagoas curassows near Belo Horizonte, hopes to re-release his birds in a restored section of the forest one day. In the late 1970s a concerned naturalist gave refuge to five of the last six known birds in the wild. Since then breeders have increased their number to 80. Highly social northern muriqui monkeys huddle near the Caratinga Biological Station (right), where a 2,365-acre reserve protects them. In two decades their population there has quadrupled to 200—almost half the remaining members of the species. At a rehabilitation center near Ilhéus, Vera Lúcia de Oliveira soothes maned sloths rescued from hunters. This elusive creature becomes an easy mark when it wanders into the open. "The destruction of the forest," says Oliveira, "means the annihilation of these animals."

MITU MITU (ALAGOAS CURASSOW)



BRACHYTELES HYPOXANTHUS (NORTHERN MURIQUI MO)

The tamarins are so at home in the forest that I have to remind myself they shouldn't be here—well, they should be here, but they came so close to extinction that their presence today is akin to a miracle tale.

overseen the planting of some 30,000 seedlings. "Of course, it's very difficult," she says. "But it is not too late to try this, and so we are doing it."

To get an idea of how much of the Atlantic forest has been destroyed, one has only to look at maps of the area. On many of them the forest is shown as dark splotches of green among the lighter greens and browns that depict agriculture, or the red swaths representing cities. In southeastern Brazil, along the coastline where the Mata Atlântica is most intact, maps typically show a broad stroke of deep green. But around the city of Rio de Janeiro and in the northern state of Bahia, the darker shade gives way to large patches of olive, sage, beige, and red. In many places on the maps, only specks of the richer green remain.

In one of those specks, about 60 miles from Rio, I join Marina Lapenta, a wildlife biologist with the Golden Lion Tamarin Association, as she and her assistant search for a group of radio-collared tamarins. The speck is named the Poço das Antas Biological Reserve and covers some 13,600 acres, about half forested. The rest will be, too, if the association has its way. Plans are afoot to connect the reserve to forested plots on nearby ranches via corridors that would nearly double the size of the tamarins' habitat here.

"All of this is secondary forest," Lapenta says, as we make our way through a tangle of vines, thorny palms, and spindly broad-leafed trees—the kind of trees and plants that sprout after an old-growth forest has been cut. Her assistant, Jadir Ramos, turns his radio antennas in a slow arc, homing in on the tamarins' signal. "They're coming this way," he says.

Right on cue, the air suddenly fills with the tamarins' high-pitched whistles, clucks, and warbles. They spy us and make a sharp alarm cry, then leap into the uppermost branches of a tree with such speed they look like flying cats. For a moment there is only a blur of red-orange, silky fur. Then curiosity gets the better of them, and they inch closer to peer down at us. "They'll get used to us," whispers Lapenta. "But they're nervous because another group is coming this way."

In the distance we hear the other group's whistles and clucks, and the tamarins turn to face the sound. Looking something like a miniature samurai warrior with his slightly Asian-tilted eyes and mane of sunset orange fur, the oldest male jumps into a neighboring palm, positioning himself to meet the challengers as they move closer. "This is a way for females to meet mates too," says Lapenta. "Sometimes a male and female go off to form a new group."

But neither love nor war is in the cards this morning. The oldest males from each group eye each other, then resume their feeding, picking out juicy bugs from beneath the fronds' fibers. The tamarins are so at home in this setting that I have to remind myself that all the animals busily hunting, chirping, and socializing shouldn't be here—or rather, they should be here, but they came so close to extinction 40 years ago that their presence today is akin to a miracle tale. By the 1960s only 150 individuals remained in the wild. The tamarins' forest had been reduced to shreds, and ranchers still actively captured and sold the surviving primates.

"Then 20 years ago this project started," says Denise Rambaldi, director of the Golden Lion Tamarin Association. "In 2001 we celebrated the thousandth birth of a tamarin in the wild."

Supported by more than 30 Brazilian and international organizations (including the National Geographic Society), researchers have used some of the most intensive, hands-on measures in conservation biology to achieve success. Tamarins were carefully bred in several zoos in the United States and Europe, taught to forage for wild foods, then relocated to the reserve and nearby ranches that offered protection. Poachers were actively pursued, and an environmental education program was introduced—with such success that locals today proudly ask if you've seen "their" golden lion tamarins. Ranchers, too, were given financial incentives to protect the forest and tamarins on their lands. At the same time, conservationists began to reforest the reserve.

"It's not a manufactured, 'fake' forest," emphasizes Luiz Fernando Duarte de Moraes, a restoration ecologist with the Atlantic Forest

Program at the Botanical Garden of Rio de Janeiro. Fernando leads me on a tour of a young forest corridor covering about ten acres. "The forest grows naturally. We're just giving it a hand." He shows me the willowy sprout of a jacaranda tree. "This is not one we cultivated. It's actually a very rare species. But its seeds were here in the soil. It returned on its own." The tamarins are returning too. "They're already coming into these trees to hunt. So that shows they will use these corridors. Meter by meter, we're expanding their habitat," he says.

Indeed, the success of the Golden Lion Tamarin Association is one reason conservationists have turned to corridors as the method of choice for saving the Mata Atlântica's highly endangered species. "There's so much to save," says Marcelo Passamani. "Rare birds, rare plants, the tamarins, muriquis [woolly spider monkeys], wild dogs, jaguars, peccaries, and tapirs, even little rodents."

Until the 1980s few grasped how unique the forest was. "We ignored the urgency of studying the forest before then," says Guedes-Bruni. "Partly, we felt we could study it anytime, because most Brazilians live right next to the Mata Atlântica. And part of it was our attitude. People didn't call the forest *mata*. They called it *mato*—unproductive land that needed improvement."

Thus devalued, the forest was steadily eroded. Only after researchers began to inventory its remaining species in the 1980s did they realize that the Mata Atlântica came close to the Amazon in terms of endemism. And although today's Atlantic forest is only a small fraction of the size of the Amazon, it supports about two-thirds as many mammal species—269, while the Amazon has 427. This new awareness gave birth to a growing environmental movement. In the early 1990s, when about 8 percent of the forest remained, the Brazilian government finally issued a decree banning all further cutting of native species in the Atlantic forest.

"We have some good laws," says Rambaldi. "Ranchers must keep 20 percent of the forest on their lands, for instance. But no one enforces the laws. It's true that it's now rare to see clear-cutting, but people still take a few trees here,

a few trees there. That's what's destroying the last of the Mata Atlântica—this nibbling."

Farmers typically burn their fields after harvesting their crops, and these fires also eat away at the forest—and the newly planted corridors. At Poço das Antas, a few miles from where we watched the tamarins feeding in the palms, a fire had been burning for more than a week, consuming trees and shrubs.

"It takes time to change peoples' attitudes," says Guedes-Bruni. "And we need to make big changes. The problem is, the forest is being destroyed faster than we can change."


Sometimes, however, changes do come, and in unlikely ways. In the state of Alagoas, in the northeastern part of the Mata Atlântica where barely 2 percent of the forest remains, the Serra Grande sugar company is the region's leading proponent of reforestation and conservation.

"I never expected to find a forest like this here," says Marcelo Tabarelli, an ecologist from Federal University of Pernambuco in Recife who is working with the company to increase the forest on its land. He and two of his students lead me along a boggy trail from a sunny sugarcane field into the twilight of a dense forest. "This forest has never been cut," he says. "You can tell from the size of the trees, the big liana vines, the number of bromeliads and orchids."

He stops beside one soaring tree with a girth easily ten feet around. Bromeliads as big as truck tires splay from the tree's muscular branches, and lianas as fat as overfed pythons wind down from its sky-high crown. "I'm sure this tree is at least a thousand years old," he says. "It's remarkable to find a tree of this age anywhere in the Mata Atlântica, but especially here."

This was one of the first parts of Brazil to be settled, and most of the forest was turned into sugar plantations and cattle pastures long before a naturalist ever visited. "This is the rarest, most endangered part of the Mata Atlântica. It's like being on a scientific frontier. We're always discovering new species—frogs, bromeliads, trees, shrubs, an owl, even a bee," says Tabarelli.

Somehow, even as the (Continued on page 22)



Snake Island

Danger lurks everywhere on Queimada Grande, the only home of the deadly golden lancehead. As University of São Paulo researcher Marcio Martins snags one snake with a gripper pole, another slithers along mossy trees. "You have to be alert to avoid stepping on them," he says. The golden lancehead likely became a separate species after its realm split from the mainland about 10,000 years ago. It eats birds, which it immobilizes in seconds with the fastest acting venom of any South American viper.

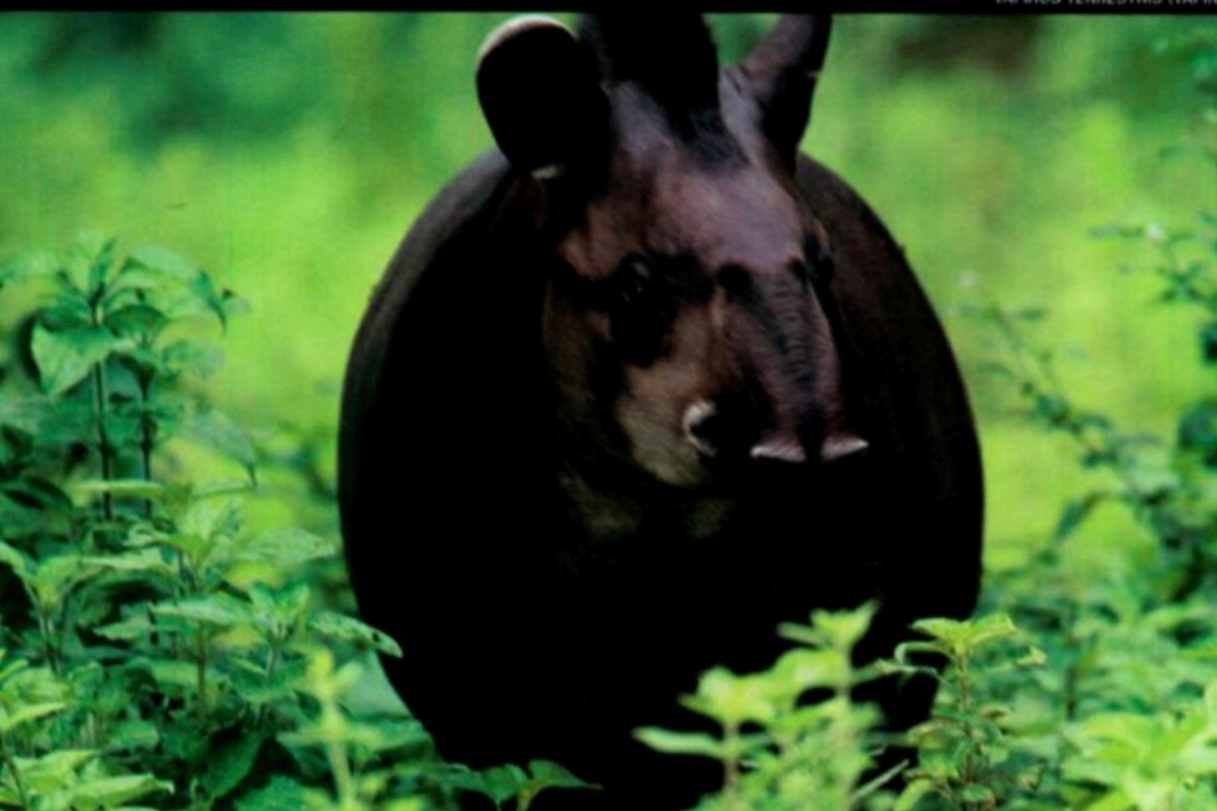
BOTHROPS INSULARIS (GOLDEN LANCEHEAD)



TANGARA CYANOVENTRIS (GILT-EDGED TANAGER)

SHARED SPACE

Hoping the government will give them part of an abandoned cattle ranch, José and Carmosina Costa (left) and 81 other landless families have built houses on the site. Close by lies the Poço das Antas Biological Reserve, home to the rare golden lion tamarin and a rainbow assortment of birds like the gilt-edged tanager (above). Supporters of the squatters believe they can learn a low-impact lifestyle. Critics say they leave trash, often hunt and cut firewood illegally, and carry out slash-and-burn farming. In the state of Alagoas, the Serra Grande sugar company shows that human endeavor can restore what it previously destroyed. To protect the watershed, it preserves forest on more than a third of its 60,000 acres. Some parcels cover several thousand acres, others run as corridors between fields of golden-flowering sugarcane (below). The company sponsors captive breeding of species such as the tapir (bottom left), an important disperser of fruit seeds.



TAPIRUS TERRESTRIS (TAPIR)



land was changed from forest to an almost endless sea of sugarcane, this parcel—about 9,000 acres—survived intact. “It’s here because the sugar company needs water for its fields and generating electricity. And its managers know that forests are necessary for a healthy watershed,” says Tabarelli. Altogether the company has some 27,170 acres planted in sugarcane and another 22,230 acres of forest.

Although the sugar company essentially saved the forest out of self-interest, it prides itself on what it has conserved. “There’s forest here today because the company protected it,” says José Bakker, the physical plant manager and company liaison with Tabarelli. “When I came here in 1986 the forest was like an empty house. There were a lot of trees but very few birds and mammals because of the poaching. I wanted to bring back its inhabitants.” Working with conservation groups, Bakker reintroduced capybaras into some of the forested fragments and plans to bring in tapirs and peccaries.

For his part, Tabarelli is skeptical that corridors are the answer to saving the forest here. Often, he notes, corridors are simply too narrow to be of use to animals that live in the deepest regions of a forest. “We can’t wait to find out if corridors—even though they’re the newest paradigm for conservation here—will save species,” says Tabarelli. “We’re trying some. But I think our best shot is first to increase the overall size of the forests we have. Where you have good, dense forest, you have more species.” Tabarelli hopes to do that by planting trees around the fragments’ edges rather than connecting them with corridors. To that end, the sugar company (in alliance with conservation organizations) is planting 130 acres of forest a year.

The tragedy of the Mata Atlântica is that so much of its biodiversity has already been lost. Indeed, four animal species known to have recently become extinct in Brazil all lived in the Atlantic forest. Because of the scale of loss, conservationists agree that the Mata Atlântica will never be fully restored—no matter how many corridors are planted or fragments enlarged. “What we can do is stop the destruction to save what remains,” Tabarelli says. “And increase the forest where we can.”

“Yes, maybe this can be done,” says the ecologist Guedes-Bruni, who admits to being pessimistic about any larger plans to bring back

Small Wonder

Not quite a true porcupine, not really a spiny rat, the thin-spined porcupine has no close relatives anywhere in the world. Feared extinct until scientists rediscovered it in the 1980s, this curious creature offers hope that other unique species can find shelter deep in the forest’s remaining shadow.

the Mata Atlântica. “I would never tell my students I am doubtful, because they are full of hope, and they might make a big change.”

For now the students and researchers like Tabarelli are intent on deciphering from the forested fragments how a “real rain forest”—one with trees a thousand years old and stretching miles instead of acres—works. In one medium-size fragment above a recently harvested sugarcane field, we hike a short way beyond the forest’s edge to meet two students who’ve tacked paper disks to several tree trunks. They’ve scented each disk with the odors that different orchid species use to attract male euglossine bees.

“That’s how we found a new bee,” says Evelise Locatelli. “It came to this scent.” She opens a vial and wafts its malodorous brew toward my nose. I take a step back as a blend of mildew, stinky gym socks, and chlorine hits my nostrils. “My new bee loves it,” she says, laughing as I wrinkle my nose. “Wait until you see him. He is beautiful!”

Locatelli touches more of the scent from the vial to the disk, and her newest discovery soon arrives. It zooms in straight toward the reeking disk; Locatelli’s colleague captures it quickly in a butterfly net. She gently untangles this male, whose throbbing thorax is shaded cinnamon and green. “It’s really his color and small size that told us he was something new,” she says. “So now we want to know, where do these bees live? How far do they travel? Do they like only the big forest, or can they live in the small bits and corridors too? Many questions!”

They’re the questions every researcher in the Mata Atlântica wants to answer for his or her favorite species. It’s what they need to know as they set about restringing, pearl by pearl, the broken necklace of the Atlantic forest. □

WEBSITE EXCLUSIVE Hear photographer Mark Moffett narrate the *Hylodes asper* frog’s high-kicking courtship dance at nationalgeographic.com/magazine/0403.



BY MARK W. MOFFETT

I've been crazy about frogs since I was a kid. I collected them along with snakes, ants, and other critters, and even joined the Wisconsin Herpetological Society as a charter member—at age 14. Now, as a zoologist-photographer, I get to combine my two great passions. For a guy like me, an assignment to cover Brazil's Atlantic forest was a ticket to . . .

Frog heaven

By a stream on the island of São Sebastião, a frog's fevered leap made me the key prop in an amphibian romance. I didn't see it coming, though. For hours I'd been crouching in the cold, rushing water to capture the foot-flagging mating dance of a male *Hylodes asper*. Swarms of the island's infamous blackflies, called *borrachudos*, bored into me as the frog whistled his mating call and danced his heart out. When a female showed up, I suddenly found myself in the middle of the drama. Oblivious to anything but the urge to get closer to the male, his future mate hopped onto my leg as if it were a rock (below). I focused on my business, the frogs on theirs, and soon the passionate pair jumped into the water to find some privacy in the stony streambed.

When I was growing up, I dreamed of having the kind



CLAUDIO E. G. PATTO



The illusion of a rival puts a poisonous pumpkin toadlet (*Brachycephalus* sp.) on the attack—against himself. "Finding this gem of an animal is magical," says Brazilian zoologist Célio Haddad, who holds the mirror.



of grand adventure that would put me on intimate terms with nature. The exploits of naturalists like William Beebe and Charles Darwin filled my childhood fantasies. Now, I am following in their footsteps.

Like them, I face more than a few challenges. Secretive behavior makes some frogs tough to find. The world's smallest frog, *Brachycephalus didactylus*, hides in debris on the forest floor. For two days three Brazilian frog experts helped me sift through leaf litter to look for a flash of brown the size of a fingernail. As we were about to give up, we found one—just one—which I photographed on the cheek of a colleague (page 2). *Xenohyla truncata*, the only frog in the world known to eat fruit, was hard to catch and even harder to catch feeding. I watched one for two days straight, but it ate nothing.

I began this trip with a list of frogs I wanted to photograph, and I'm proud to say I found every one of them. That wasn't easy in a forest that conceals more than 370 known species—and many others awaiting discovery. □



Dancing a courtship cancan, a *Hylodes asper* repeatedly kicks right and left (above) to mark his streamside territory and attract mates. The *Phasmahyla guttata* tadpole (left) wears its mouth like a hat, allowing it to skim food from the surface of mountain streams. *Xenohyla truncata* (below)—the world's only frog that eats fruit as well as insects—lives near the beaches of Rio de Janeiro. And *Scinax arduous* (far left) lays its eggs in water caught in cupped bromeliad leaves.



Habitat Heroes Start Young

Kids tending to the Earth

Scoop by scoop, students at Harriet Tubman Elementary School in Washington, D.C., have transformed their school's courtyard (right). The nine- to twelve-year-olds planted native shrubs and trees and installed bat and bird houses to create a healthy, animal-friendly habitat—a feat certified by the National Wildlife Federation.

The Tubman kids are among our 30,000 Habitat Heroes, students across the U.S., Canada, and Mexico participating in the Society's Geography Action! program on habitats. Since September these heroes have also rescued ailing cactuses, created butterfly gardens, and



GWYNETH FALLANER

restored aquatic gardens. With help from our Education Foundation, their teachers learned how to incorporate these and other environmental projects into the classroom curriculum.

Beginning in September, Geography Action! will enlist students in a new challenge—preserving world cultures. For more details, go to nationalgeo.com/geographyaction.

Photographer Scores at Animal Name Game

Photographer and entomologist Mark Moffett, who reports on wind scorpions in this issue (see page 94), has lent his name to yet another new species. On an expedition to the remote *tepui*, or mesas, of eastern Venezuela, he and colleagues César Barrio and Charles Brewer discovered a species of rocket frog. "It's a little



MARK W. MOFFETT

brown job," says Mark of the amphibian that will soon bear a scientific version of his name—the third *moffetti*. The first, a species of beetle he co-discovered in Peru

in 1976, when he was 18, became *Notiobia moffetti*. Years later Mark found a new ant species while shooting the leafcutter ant story (see NATIONAL GEOGRAPHIC July 1995), and his mentor, Harvard biologist E. O. Wilson, christened it *Pheidole moffetti*. But Mark's legacy isn't confined to science. He helped novelist Amy Tan dream up a plant for her upcoming book, and she named it after him. Says Mark, "I guess I'm on a hot run right now."

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CAQUETÁ, COLOMBIA (PAGE 34)

- **The War Next Door** on National Geographic's Ultimate Explorer on MSNBC, Sunday, July 18, 9 p.m. ET/6 p.m. PT. Host Lisa Ling goes to the front lines of Colombia's drug war, interviewing Colombian President Álvaro Uribe, coca farmers, and even a former assassin.
- **"Kidnapped in the Gap,"** *National Geographic Adventure*, June/July 2003. Relive the terror with journalist Robert Young Pelton as he describes how he and two companions were kidnapped by a shadowy Colombian military group during a trek between Panama and Colombia.
- **South America Political Map** Put Colombia in its geographic context. Available in two sizes. To order, go to nationalgeographic.com/maps or call 1-800-962-1643.