

Below: the jaguar is under threat from habitat loss in Brazil's Atlantic Rainforest and is considered 'near threatened' by the IUCN



In the dense jungle of Brazil's Mata Atlântica – the Atlantic Rainforest – a small team of international volunteers is assisting local biologists in efforts to track down two of the region's most elusive inhabitants: the jaguar and the puma.

Erin McCloskey reports

A game of CAT AND MOUSE

Alan Carey/Science Photo Library

Watch your step,' says Dr Marcello Mazzolli as he examines the soft mud of the jungle trail. The patch looks perfect, and he and his research team quickly set about meticulously manicuring it like a Zen sand garden, clearing it of debris and levelling it out to become a jaguar trap – a natural camera that will hopefully record the tracks of this elusive predator.

Brazil-born Mazzolli is the lead biologist on the first-ever attempt to study jaguars and pumas in the southernmost parts of Brazil's Atlantic Rainforest. Once a year, he runs a research expedition with international volunteers, organised through Biosphere Expeditions, a UK-based non-profit organisation. 'No-one else is doing this kind of work, which, in a way, is surprising, since jaguar and puma are two important flagship species for this very threatened habitat,' he says.

LIFE IN ABUNDANCE

Then again, it isn't all that surprising given the precipitous terrain of the Serra do Mar mountain range, in which the project is based. The study site is located within the Área de Proteção Ambiental (Environmental Protection Area) de Guaratuba adjacent to the 25,000-hectare Saint-Hilaire/Lange National Park, which was only created in 2001 and is still relatively unstudied.

The study area reaches down to the mangrove lowlands along the Atlantic coast. Declared a UNESCO World Heritage site in 1999, the Atlantic Rainforest has also been ranked as one of the top three priorities for global conservation efforts and is recognised by the International Union for the Conservation of Nature (IUCN) as one of the world's 'hotspots' of biodiversity.

Endemism is common: of the more than 400 vascular plant species per hectare, half are endemic; of 215 identified species of mammal, 73 are endemic; and 92 per cent of the 183 amphibian species are also found nowhere else. Sadly, where endemism goes, extinction often follows, and 171 of Brazil's 202 vulnerable species are found in the Atlantic forest.

The forest has been reduced to less than eight per cent of its extent in pre-colonial times due to intensive human occupation, beginning with sugar cane plantations in the 1500s and then, later, coffee plantations. Mazzolli's study area is located in part of the untouched residue, a wild and remote area that contains only a few small villages.

FINDING FELINES

This broadleaf rainforest hosts one of the few remaining jaguar populations in southern Brazil. However, the population

Big cat facts

Both the jaguar (*Panthera onca*) and the puma (*Puma concolor*) are opportunistic predators, preying on a range of animals, including invertebrates, rodents, birds, fish, monkeys, amphibians and reptiles (jaguars have extremely strong jaws, even in comparison to other big cats, and are capable of biting through turtle carapaces).

The jaguar's favoured prey species in the Mata Atlântica are larger mammals, in particular the tapir and the peccary. Studies on pumas suggest that, probably due to their smaller body size in this part of the Americas, as well as interspecific competition with the larger jaguar, the puma is quite unsuccessful at taking down large mammals, only rarely preying on the young of these species. Instead, it tends to focus on smaller animal prey species.

The puma – also known as the cougar or mountain lion – is a much more flexible species in terms of habitat and prey selection. While the jaguar is limited to well-watered forest environs and is capable of taking down large prey, the puma is the most widely distributed large cat in the Americas, ranging from Canada to Argentina, and will adapt to any potential prey availability.

Jaguar and puma can also appear to reproduce opportunistically. While they can produce at any time of year, peaks in birth rate have been observed that correlate with the availability of prey. Gestation averages 100 days for jaguars and 92 days for pumas; litter sizes range from one to four kittens for jaguars and one to six for pumas. The kittens are weaned when they are between one and a half and two years of age.

is extremely reduced, estimated by the IUCN Cat Specialist Group to be around 200 individuals distributed in small and disconnected sub-populations – and it could be as low as 115. Protecting this isolated southernmost population is considered to be vital for the overall health of the species, as it represents a source of much-needed genetic diversity. The hope is that one day it could be connected to other populations hundreds of kilometres inland.

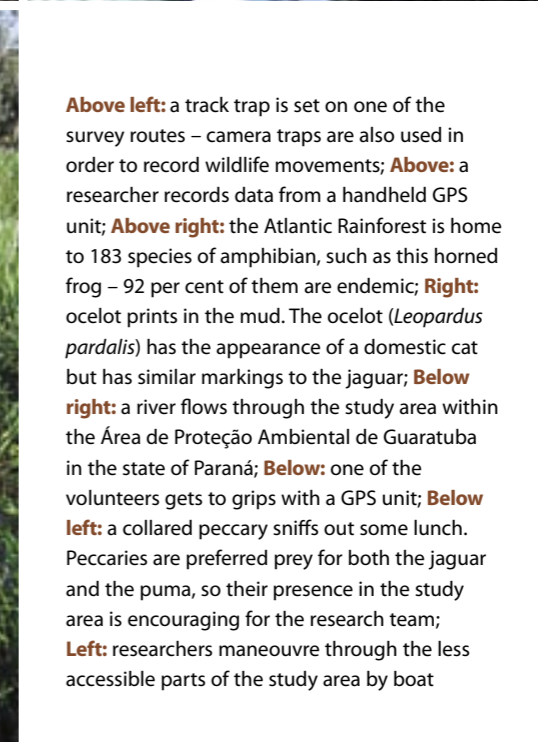
Data that Mazzolli has collected show the ongoing process of jaguar extinction in Brazil. 'Once, jaguars roamed all over southern Brazil, down into Santa Catarina state and elsewhere,' he says. 'But sadly, they have gone from these places, and their populations are receding by roughly a degree of latitude per decade. The puma is still clinging on as it's more adaptable, but it, too, is struggling.'

Enquiries in local villages point to the continued presence of jaguars in the area. 'I found jaguar tracks passing through my garden last week,' says one woman. The villagers' feelings about living among these large predators vary from slight nervousness about the cats' proximity and the possibility that they will eat their chickens to excitement at having seen one in the flesh.

The project is working to identify, restore and protect prime habitat in which the jaguar still ranges, and to promote ecotourism, in order to increase the value of the fauna and flora to the local people. The project has also begun to establish an information network with universities, environmental agencies and private stakeholders to monitor jaguar records in the species' recent historic range, and to create a framework for attending livestock-predation incidents and provide conditional compensation for any losses in order to reduce poaching.

Thankfully, commercial exploitation for the animal's pelt is no longer a factor; in 1973, the jaguar was placed on Appendix 1 of the Convention on International Trade in Endangered Species of Wild Fauna and Flora, and soon after, the Brazilian government passed legislation that prohibited hunting of jaguars. However, they still face local extirpation at the hands of farmers, many of whom perceive them as a threat to livestock.

There is also widespread poaching of collared and white-lipped peccaries, which form a significant part of the diets of both the jaguar and the puma. One of the peccaries' favourite food is the açai, the fruit of the Euterpe tree. This tree is often felled for its palmito or heart, which is eaten in salads in South America and beyond. With cooperation among farmers, government agencies and the managers



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of public and private reserves, economic initiatives are being proposed to export the more sustainable and profitable fruit, in addition to mapping potential connectivity to create a wildlife corridor.

ON THE TRAIL

Each day, Mazzoli's research team splits into groups of three or four and, equipped with compass, GPS and data-collection sheets, they head out on reconnaissance missions, combing the dense jungle for evidence of big cat presence, such as tracks, scats and scratch marks. The field surveys are carried out in 12 continuous four-square-kilometre quadrats.

Twelve camera traps are also set up on high-traffic wildlife trails. Over the course of this particular expedition, peccaries, tapirs – another preferred prey item – ocelots and pumas are all recorded, but the jaguar remains elusive. The good news is that the teams do encounter an abundance of both peccaries and tapirs, suggesting that food availability shouldn't be an issue for the cats.

One night, a few of us head out into the

jungle to see if we can hear a jaguar calling. Our attempts at cat-like stealth are woefully inadequate as we stumble through the darkness. Eventually, we stop and extinguish the conspicuous gala of our

headlamps. The canopy and cloud cover are so dense that not a trace of moonlight reaches us. We stand stock still, ears straining against the relative quiet, but sadly, once more, the jaguar eludes us. **G**

Biosphere Expeditions

Erin McCloskey visited Brazil with Biosphere Expeditions, an award-winning wildlife conservation organisation that places volunteers on scientific expeditions all over the world. The next expedition to Brazil runs from 26 October to 21 November and costs £1,090 for a two-week slot (excluding flights). Biosphere Expeditions is a non-profit organisation, and guarantees that two thirds of this contribution will go directly to the project. For more information, or to become involved in this or other wildlife projects, contact Biosphere Expeditions on 0870 446 0801 or visit www.biosphere-expeditions.org



Below: the canopy of the Mata Atlântica, which stretches along Brazil's Atlantic coast between the states of Rio Grande do Norte and Rio Grande do Sul; **Above right:** making the journey to base camp via Land Rover

