

FLOODS & FEUDS

Brazil's Pantanal has one of the world's largest jaguar populations – and some of the largest jaguars. Researcher **Allison Devlin** is following their every move.

Photos by **Nick Garbutt**



A male jaguar wades through the shallows of a backwater of the Cuiabá River in the northern Pantanal. Jaguars are very confident around water.





PANTANAL JAGUARS

The late-afternoon sun baked the parched pastures and dirt roads of Fazenda São Bento, a working cattle ranch and our research base in the northern Pantanal. The September air shimmered on the horizon and an occasional hot breeze wafted from the banks of the Cuiabá River. The dry season had peaked, so wildlife sought the oasis offered by shaded forest beside the water.

Situated in western central Brazil, the Pantanal is the largest inland wetland on Earth and home to a breathtaking diversity of flora and fauna. Smoke from a distant fire, typical here at this time of year, billowed in the sky. In the final rays of the setting sun, a small group of 20 capybaras – the world’s largest rodents – lounged along the sandy riverbank by our headquarters, still alert to any shadowy threat.

I had returned to base after a long day of field surveys with Rafael Hoogesteijn, a veterinarian and an expert in predator–livestock conflict, and Fernando Tortato, a biologist for the Brazil programme of Panthera, the big-cat conservation organisation. As I deposited the field equipment in my room, a bell rang to signal that dinner was ready.

Barely had I left my doorstep when the capybaras erupted into frenzied flight. A lithe feline form kicked up a cloud of sand and dust as it rolled over a juvenile that reacted one fateful second too late. In the fading light, I watched the cat deliver a lethal bite straight through the skull – a signature move unique to jaguars. With dinner secured in its powerful jaws, the jaguar lifted its head and quickly hauled its prize into the nearby forest.

I ran back into my room, grabbed my notebook to hurriedly record the observation, then raced to Fernando



and Rafael to ask if they had also witnessed this incredible event. Could it be that the jaguar was Noca, the famed resident female that we had recently captured and fitted with a radio-collar?

THE BIGGEST OF BIG CATS

The world’s third-largest felid and the biggest in the Americas, the typically solitary jaguar has long been a cultural icon of stealth and power. Its tawny coat is dappled with uniquely patterned rosettes that provide beautiful camouflage in a mosaic of habitats from northern Mexico to northern Argentina (all-black, or melanistic, individuals are rare). Its name is derived from the native Tupi–Guaraní word *yaguará*, meaning ‘beast that kills its prey with one bound’. And indeed this is a prodigious predator that

Top: female jaguars, such as the one pictured here resting on a fallen tree over the Cuiabá River, have litters containing one to four cubs. **Above:** female capybaras swim with their young in a lagoon off the Paraguay River. **The rodent is key prey for the Pantanal’s jaguars.**

Above and above right: jaguars (here a female) are excellent swimmers. Rivers provide no escape for their prey, such as this capybara. **Right:** the big cat (this one is male) has such strong jaws that it can bite through the skull of its prey (here another capybara) and pierce its brain with its canines. **Below:** the yacare caiman – another key jaguar prey item – is thriving in the Pantanal.

stalks prey very close and, after a lightning-quick pursuit, delivers that bone-crunching bite with a force of over 700 pounds per square inch [SETH TO CHECK WITH HER].

Jaguars in the Pantanal are among the largest in the world, tipping the scales at an average of 100kg in males and 70kg in females. The heaviest males can weigh over 140kg. In contrast, males and females in Central America generally average 50kg and 40kg, respectively. The gargantuan Pantanal jaguars are well fed by a variety of large-bodied prey, including an abundance of capybaras and yacare caiman.

Though caiman are seen sunning on beaches during the day, their astonishing numbers are most apparent at night. A steady sweep of a spotlight reveals a river teeming with the shining orbs of dozens – sometimes hundreds – of the unblinking reptiles. Armoured with bony scutes and reaching lengths of up to 3m, these crocodilians are still no match for the phenomenal bite of the Pantanal jaguars.

During the June–November dry season the Cuiabá River is tame, its languid current bound by shorelines teeming with plant life. Forest canopies burst with the pink or

yellow blossoms of tabebuia trees, while the branches of mango trees are heavy with ripening fruit. But from December to May torrential rains and water pouring from the Amazon Basin cause the swollen river to breach its banks, flooding these plains

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up to 3m deep. Wildlife and cattle alike flee to dry ground, wherever they can find it.

Jaguars, however, are more forgiving of these seasonal surges. Most aquatic of all of the big cats, they are powerful swimmers and will happily dive underwater to pursue a fleeing caiman or capybara. I have watched jaguars calmly glide with the current and use the river as a highway to travel from one beach to the next. Indeed Noca once crossed this broad river five times in just seven days.

ROOM TO ROAM

Jaguars roam expansive territories – the radio-collared males in our project defend an average of 100km² (in contrast female territory averages 40km²). During the wet season their home range is relatively small, because prey gathering on the few remaining islands of exposed ground provides easy pickings. But in the dry months these animals once again freely disperse through the landscape – and the jaguars inevitably follow.

However, caiman and capybaras routinely patrol the riverbanks in any season. So, whenever possible, jaguars prefer to stalk the narrow strips of ‘gallery’ forest bordering the rivers. And though the big cats are solitary, they are by ►



A male stalks along the bank of the Cuiabá River. There may be fewer than 100,000 jaguars left in the wild.

DOMINANT MALES IN THE PANTANAL HOLD THEIR TERRITORY FOR JUST TWO OR THREE YEARS BEFORE THEY ARE OUSTED.

no means an island unto themselves. Territorial boundaries need defending, food needs catching and mates need finding. A dominant male secures a territory large enough to overlap with those of three or four females. Males mark their borders with strategically placed scats, scrapes or sprays of urine. If those signs fail to deter a potential usurper – perhaps a covetous neighbour, or a subordinate, lower-ranking ‘transient’ – roars usually do the trick.

When this chesty percussion of cough-like bellows echoes through the night, the forest becomes deadly silent. Will there be a confrontation? Or was the threat enough to warn off the trespasser? Our studies have found that

The Pantanal offers a wealth of other fascinating wildlife, including these common toucans flying across the Piquiri River at dawn.

dominant males in the Pantanal hold their territory for just two or three years before they are ousted by a newcomer or neighbour. This may help to keep the mating pool fresh so that future generations of jaguars are genetically diverse.

We have yet to discover exactly how females with cubs navigate this perilous landscape, and protect their offspring from the tumult of warring males and rival neighbouring females. We suspect that, like other solitary big cats, the female hides her young cubs in carefully chosen dens at the core of her home range. But what makes for an ideal den? And how do cubs survive the different challenges of seasonal flood and drought? We hope to reveal such closely held secrets in the next phases of our work.

PLAGUED BY PARASITES

Floods and feuds are not the only source of strife in the Pantanal. Though small, parasites are the bane of many an animal’s existence. During the dry season, the Pantanal has few mosquitoes, but its swaths of forest host a plethora of ticks and large biting flies. Joares May, a Brazilian wildlife vet and professor at the University of Southern Santa Catarina, has captured dozens of jaguars for research purposes throughout the Pantanal. He says that though the dry season is ideal for capture campaigns, ticks are one of the most unbearable parts of fieldwork.

Sometimes we capture jaguars absolutely covered in ticks, and do our best to relieve the cat of its burden (and study the ticks for any diseases they may carry). By the end of a long day in the field, you’d swear that every tick in the Pantanal had found its way onto your poor arms and legs.

During the peak wet season, mosquitoes swarm in near-maddening quantities. Elza Silva Costa, a long-time caretaker of a remote Pantanal homestead near Acurizal, regaled me with tales about the hardships her family endures. Mosquitoes blacken the screened windows in such great numbers that no daylight can get in, while chickens die from anaemia due to the flies’ unrelenting appetites. Jaguars and other wildlife are forced to

NOCA: STAR OF THE PANTANAL

Now about eight years old, Noca is a long-time resident of the Pantanal’s Jofre region and the star of several US TV documentaries. She is often seen around the ranch headquarters, swimming the Cuiabá and Piquiri Rivers or sunning herself along their sandy beaches. We have tracked Noca’s movements over multiple

seasons and discovered that, unlike most jaguars, she holds a narrow territory along the rivers throughout both wet and dry seasons, probably due to the plentiful caiman prey. In 2013 she was observed with a male cub, confirming that our conservation efforts are helping to secure a future for this amazing species.

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PANTANAL JAGUARS



Male jaguars such as the one in this photo can reach 158kg. Fully grown females are considerably smaller, weighing 36–85kg.

wallow in lagoons and rivers to escape the parasites' unrelenting harassment.

However, Elza is in a minority, because over 95 per cent of the Pantanal is held by large cattle-ranching operations; less than 5 per cent is protected for wildlife. Unfortunately, historically this great floodplain didn't just produce beef – until the early 1970s illegally traded jaguar skins were also a major export. The region's jaguars were saved from near-extinction by fur-trade regulations set by the Convention on International Trade in Endangered Species (CITES) and adopted by Brazil in the mid-1970s. Nevertheless there are still retaliatory attacks by cattle ranchers.

A VERY MYSTERIOUS CAT

I have spent nearly three years in the Pantanal, yet feel I have barely scratched the surface of what we need to know about its jaguars. Soon I'll return for another two years, and together with my *Panthera* colleagues and many other researchers I hope to develop cutting-edge techniques to reduce the conflict with landowners. So while the Pantanal's jaguars remain threatened, there's cause for hope. We're working to develop a local economy based on both cattle and jaguars, where landowners, communities and tour guides all benefit from these charismatic cats.

A case in point is our new research base, Jofre Velho, on the opposite side of the Cuiabá River to Fazenda São Bento. Once Jofre Velho was a major cattle ranch, but over 10,000ha was declared a protected landscape in 2015,

and we have plans to open a school here for the children of the region's ranch hands, to demonstrate how jaguar conservation benefits local communities. Since 2006, the number of jaguars has already doubled; Fernando's latest camera-trap study revealed 27 individuals at Jofre Velho and

HOW TO SEE PANTANAL JAGUARS

● The Pantanal is a great place to spot jaguars. The peak season runs from mid-June to early November, which is cooler and drier.

● **Reef & Rainforest** (01803 866965, <http://reefandrainforest.co.uk>) offers jaguar-watching tours to the region. It uses US firm **SouthWild's** Jaguar Flotel and Suites (contact@southwild.com, www.southwild.com).

● Other UK firms offering jaguar tours include

Natural World Safaris (01273 691642, www.naturalworldsafaris.com), **Naturetrek** (01962 733051, www.naturetrek.co.uk), **Speyside Wildlife** (01479 812498, www.speysidewildlife.co.uk), **Steppes Travel** (01258 787416, www.steppestravel.co.uk), **Wildlife Worldwide** (01962 302086, www.wildlifeworldwide.com) and **WildWings** (0117 965 8333, www.wildwings.co.uk), and there are local operators based in Campo Grande.

Fazenda São Bento, with more still in the greater Jofre area.

Today there are on average between six and eight jaguars in each 100km² of the Pantanal, with Jofre at the higher end of the scale. Such a remarkably high concentration, combined with the presence of some jaguars that have become used to humans, has enabled a boom in ecotourism. Boat trips can offer close views of the local jaguars lounging along the riverbanks, and sometimes even swimming, hunting or fighting over territory.

Our work is full of such thrilling encounters. Though we were unable to confirm the identity of the jaguar that I watched capture the juvenile capybara, the dramatic event left me with a newfound resolution. This cat was still hunting native prey in front of a busy ranch, which shows that if we just give jaguars the space and protection they need they can co-exist with humans and continue to survive the seasonal challenges of the Pantanal. 🐾

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➕ FIND OUT MORE

Jaguars of the Pantanal, part of the new series of *Natural World*, airs on BBC Two in September: <http://bbc.in/1iqhj7P>

WE'RE WORKING TO DEVELOP AN ECONOMY WHERE LANDOWNERS, COMMUNITIES AND TOUR GUIDES ALL BENEFIT.