‘Losing Noah’s Ark’: Brazil’s plan to turn the Pantanal into waterway threatens world’s biggest wetland

Hidrovia project to dredge Paraguay River and build ports may destroy vast biodiversity and refuge of jaguars, giant otters and armadillos – and an age-old riverine way of life

Harriet Barber *in Cáceres*
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A female jaguar prowls along a riverbank. Photograph: Paul Goldstein/SWNS

As the evening sky turns violet, the animals of the Pantanal gather near the water. Capybaras swim in tight formation, roseate spoonbills add smudges of pink to the riverbanks, the rumble of a jaguar pulsates from the forest.

This tropical wetland is the largest on Earth, stretching across Brazil, Paraguay and Bolivia, and playing host to some of the greatest gatherings of animals anywhere.

Now, scientists say the survival of the entire biome is at risk.

“The Pantanal is like Noah’s Ark. It is home to animals that are disappearing … a place where those at risk of extinction can survive,” says Pierre Girard, a professor at the Federal University of Mato Grosso.

“That could be about to change,” he says. “The Pantanal, as we know it, could soon cease to exist.”

Roseate spoonbills, wood storks and cattle egrets take flight. Photograph: Danita Delimont/ Alamy

The 170,000 sq km (42m acre) wild expanse harbours one of the world's most biologically rich environments, with at least 380 species of fish, 580 types of birds and 2,272 different plants. It is one of the main refuges for jaguars and houses a host of vulnerable and endangered species, including giant river otters, giant armadillos and hyacinth macaws.

It seems a high price to pay – destroying the Pantanal, a unique system, to reduce the price of grain
Prof Carolina J da Silva

But plans are under way to revive plans for the Paraguay River, one of the Pantanal's main arteries, to be turned into an industrial shipping route for crops such as soya beans and sugar.

Political proponents say the waterway would reduce costs and time for exporting agricultural commodities to North America, Europe and Asia but critics warn that its creation – which involves building new ports, possibly straightening bends and meanders, and large-scale dredging – would cause irreversible damage to the wetland and its wildlife.

"It seems a high price to pay: destroying the Pantanal, one of the world's unique systems, to reduce the price of grain," says Carolina Joana da Silva, a professor at Mato Grosso State University. "It is a war – a war which risks extinction."

Sunset in the Pantanal. Photograph: Andre Dib/WWF

Inside a communal fishers' work shed in Cáceres, 64-year-old Elza Basto Pereira, the head of the community, says construction materials began arriving along the river six months ago.

"Roads are being built for the planned ports, and materials are being lined up along the river; they keep coming," she says.

The threat of the development, known as the Hidrovia Paraguay-Paraná waterway, has haunted the Pantanal for decades. Early iterations – which involved dredging and straightening river curves on hundreds of sites – were shelved by the Brazilian government in 2000 due to environmental concerns.

Prof Pierre Girard fears the waterway project could spell the end of the Pantanal. Photograph: Harriet Barber

But the push to develop waterways through the wetland has continued. Now experts believe a new strategy is being deployed, one that sees sections of the project approved piece by piece.

"The politicians and companies are forcing it through dismembered," says Girard.

Last year, the Brazilian government announced that the Paraguay River, which drains the wetland for six months then floods it for the rest of the year, would be developed under its growth acceleration programme. Its website says the national project has "great potential to reduce transportation costs" and that "discussions are being held with society and local stakeholders".

The government announced an investment of 81m reais [£11m] for dredging, clearing vegetation and adapting the navigable channel's signage. Preliminary licences were issued for the construction of two port facilities at Porto Esperança and Cáceres, which opponents say is the first step towards transforming the largest natural section of the Paraguay River into an engineered waterway.

Lourenço Pereira Leite, 54, sits with Basto Pereira at the Cáceres fishing shed. They are part of the *ribeirinhos* (riverside community), who live off sustainable fishing and small-scale farming.

"They try to deceive us," Pereira Leite says. "When the waterway was first presented in the 90s, the supporters said it would bring prosperity – it did not. It started to destroy the environment instead.

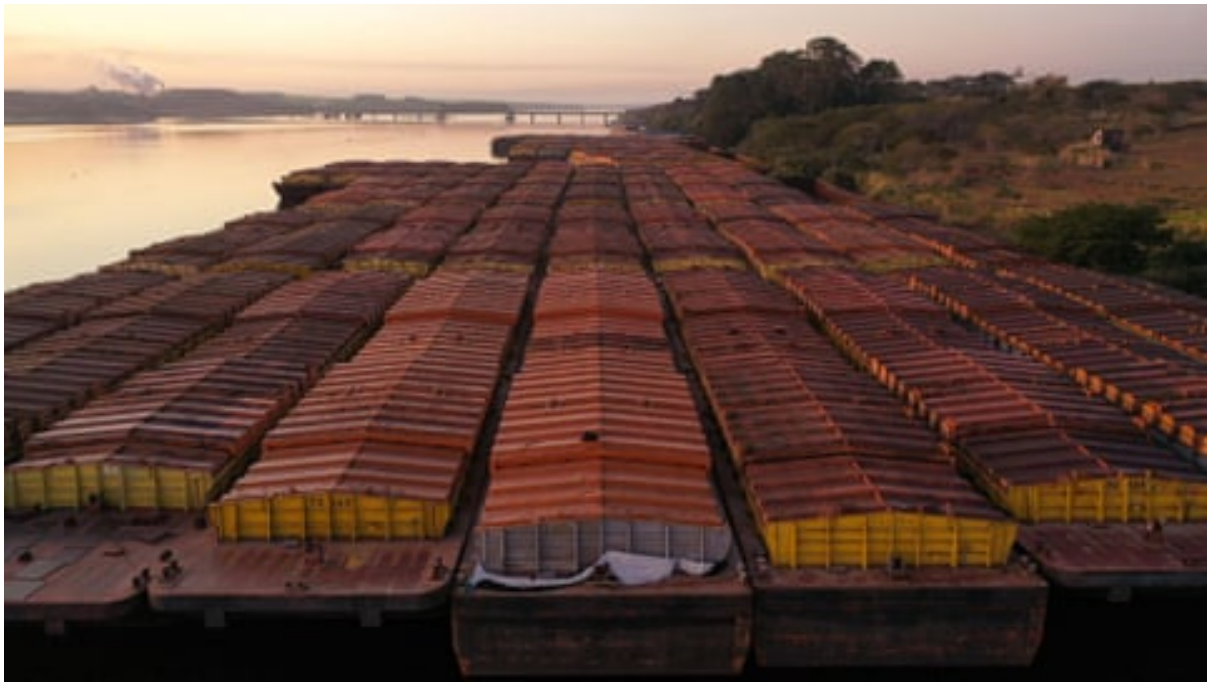
"Now they come again, with the same words 'progress, progress', but we know it will mark the end of our fishing, our families."

The Pantanal is the world's largest tropical wetland, with 380 species of fish, 580 species of birds and 2,272 plants. Photograph: Carl de Souza/AFP/Getty

The Pantanal, often called the “kingdom of water”, is made up of more than 1,200 rivers and streams, and the vast biodiversity relies on the seasonal flood pattern. Scientists fear dredging and deepening will in effect create a “big drain”, disconnecting the Paraguay River from its floodplain and shrinking the wetland area.

Scientists warn this could destroy aquatic habitats, fish populations, bird nesting areas, and consequently affect other species all the way through the food chain.

Among those most at risk are the black skimmer, neotropic cormorant, Mato Grosso antbird and white-lored spinetail, according to Dr Angélica Vilas Boas da Frota, a local biologist, though larger mammals such as jaguars could also be affected by declining fish populations.



Scientists warn that dredging the Pantanal’s rivers so they can be used as commercial waterways could destroy aquatic habitats, fish populations and bird nesting areas. Photograph: Foto Arena LTDA/Alamy

Wetlands are also of global importance for the climate. Despite covering only 5-8% of the Earth’s land surface, they could store up to 30% of terrestrial carbon. The Pantanal is a critical carbon sink, but perpetual dredging – which would be required for barges to pass, due to the sandy sediment along the riverbed – would lead to the release of greenhouse gases, further contributing to global warming.

The risk of wildfires could also increase, but such concerns are not being heard, scientists say. “Brazil sees the Amazon as its international environmental playing card,” says Girard, while the Pantanal remains forgotten.

Edna Luiz Dias, who has always lived along the Paraguay River, says: ‘I will stay and fight for my life and for the Pantanal.’ Photograph: Harriet Barber

Near Tucum, 55-year-old Edna Luiz Dias grills a freshly caught pacu fish. Her wooden stilted house is surrounded by trees and native plants. “I don’t need much money – only the fish, the birds, the fruits, the nature,” she says.

“But this waterway could take that all away. I can already feel the river changing.”

With its deeply curved rivers and thick marshes, this section of the Pantanal, close to Cáceres, remains sparsely populated by humans, but Porto Esperança already sees the effects of large barges on the river.

An existing port is now used to transport iron. The mineral leaves a thin layer of red dust on the fishing village’s land and trees. There are eight Indigenous communities living in the Pantanal, of which at least the reservation of the Guató people would be directly affected by making the river navigable, scientists say.

“The barges have already affected the environment, spreading iron over the water, our soil, our plants,” says Natalina Silva Oliveira Mendez, 50. “Adding the new port and creating the Hidrovia will be a disaster.”

The *ribeirinho* communities in the Pantanal rely on small-scale fishing but the Hidrovia plans threaten that. Photograph: Harriet Barber

Local businessmen, however, say the waterway – which they hope would facilitate year-round transportation – will bring economic development and wealth to the region. Adilson Reis is an engineer from Cáceres and works as a consultant on the project. He predicts it will be operational by 2026.

“As we develop, it is necessary to increase transport options. For years, the waterway has been paralysed,” the 75-year-old says. “I want the city of Cáceres, as a person who was born here, to grow. I think the waterway will bring prosperity.”

He agrees that the environment is a concern, but says certain conditions can be enforced – such as limiting the size of barges – to mitigate the risk.

In response to this article, the Brazilian ministry for ports and airports said the concerns raised about environmental damage were “opinions” without “scientific elements to support them”, and that a debate for each project would

be held. The ministry of environment and climate change did not respond to requests for comment.

Among the ribeirinhos, the consensus is that the Hidrovia will indeed go ahead, but they are not ready to give up their centuries-old way of life.

“Society does not want to hear us because then they can create whatever they want – dams, waterways, ports,” says Luiz Dias.

“But I want the world to know that we are here – and that I will stay and fight for my life and for the Pantanal.”

Pantanal waterway project would destroy a ‘paradise on Earth’, scientists warn

The South American wetland, which falls within Brazil, Bolivia and Paraguay, would be vulnerable to biome loss and increased wildfires

- ‘Losing Noah’s Ark’: Brazil’s plan to turn the Pantanal into waterway threatens world’s biggest wetland

Phoebe Weston

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The Paraguay River flowing through the Pantanal wetlands, Mato Grosso do Sul state, Brazil. Photograph: Bloomberg/Getty Images

Dozens of scientists are sounding the alarm that carving a commercial waterway through the world's largest wetlands could spell the "end of an entire biome", and leave hundreds of thousands of hectares of land to be devastated by wildfires.

The Pantanal wetland – which falls within Brazil, Bolivia and Paraguay, covering an area almost half the size of Germany – is facing the proposed construction of a commercial waterway, as well as the expansion of industrial farming and spread of intense wildfires. A cohort of 40 scientists say the waterway development represents an existential threat to the ecosystem: reducing the floodplain, increasing the risk of fires and transforming the area into a landscape that could more easily be farmed.

Prof Karl M Wantzen, an ecologist from the University of Tours, and Unesco chair for river culture, said the wetland "is a real paradise on Earth. Nowhere else will you see so many hyacinth macaws, jaguars, swamp deer, anacondas, caymans, more than 300 fish species, 500 bird species, 2,500 species of water plants … All of that is at risk."

The Brazilian government wants to develop the upper 435 miles (700km) of the Paraguay River into the Paraguay-Paraná *hidrovia* (waterway). In 2022 and 2023, preliminary licences were issued for the construction of port facilities within the Pantanal.

“If the hidrovia project goes ahead, navigation of large train barges in the Pantanal, with dredging in critical reaches of the Paraguay River, will probably mean the end of the Pantanal as we know it,” said Pierre Girard from the Federal University of Mato Grosso and Pantanal Research Center. “Reducing the annually flooded area, [coupled] with climate change and increased pressure on land use in the biome will increase the risks of destructive fires like the catastrophic ones seen in 2020 [when nearly a fifth of the area burned].”

Guardian graphic. Source: Open Streetmap, Federal tax authority of Argentina, Padovani C R (2010)

In 2024, fires were the worst on record, with nearly 1.5m hectares (3.7m acres) burning across the Brazilian Pantanal by early August. Since 1985, the Pantanal has lost about 80% of its surface water – more than any other biome in Brazil. If the waterway goes ahead it is likely to further shrink the wetland, making it even more dry and vulnerable to wildfires such as those seen in 2020.

The upper section of the Paraguay River is sinuous and shallow. Making it navigable for 50-metre barges would mean extensive dredging, fixing of riverbanks and construction of ports. This would permanently alter the natural cycle of flooding and shrink the wetland area, researchers warned. Wantzen and Girard are two of more than 40 scientists who wrote a paper, published in the

journal Science of the Total Environment, arguing that the waterway must not be expanded into the wetlands.

Wantzen, the lead author, said he and his colleagues published it because “I really want the world to know what’s happening. I wanted to gather people to spell out what the current situation is. It would be a senseless tragedy.”

Smoke from wildfires rises into the air in the Pantanal, in Corumba, Mato Grosso do Sul state, Brazil, June 2024. By early August nearly 1.5m ha had burned. Photograph: Ueslei Marcelino/ Reuters

“The Paraguay River flowing through the Pantanal is the last large riverscape in central South America that still has near-natural structure. It represents the biocultural heritage of the Brazilian people and the entire world,” researchers wrote.

‘For us, the Amazon isn’t a cause, it’s our home’: the riverside communities stranded by the climate crisis

Dredging this area would result in “severe degradation of the globally outstanding biological and cultural diversity of the Pantanal”, the paper warned. The wetland is also home to Indigenous peoples whose livelihoods would be threatened. The paper said railways would be a more reliable and less disruptive way to transport goods.

The growth of industrial soya bean farming has driven demand for a commercial waterway to transport goods from areas of production in Brazil, Paraguay and Bolivia to the coastal seaports in Uruguay and Argentina. Barges would also carry sugar, corn, cement, iron and manganese. The markets for these goods is North America, Europe and Asia.

The argument for creating the waterway is that barges would be faster and cheaper than transporting these goods by truck. Due to the climate emergency and reduced flooding, even with dredging, scientists believe the water level in the river would be too low to allow navigation.

“Humanity is crazy, destroying everything it can and at high speed,” said Mario Friedlander, who works in wildlife observation tourism and photography in Mato Grosso. “The operation of the waterway in the Pantanal is yet another serious attack against a place that is powerful in nature, but completely unprotected.”

Friedlander said that agricultural expansion had been one of the main developments destroying the area. He said: “We have so many fronts of destruction here, that I no longer know where to start the defence”

Responding to concerns raised by the scientists, the Brazilian Ministry for Ports and Airports said the paper contained “opinions” without “scientific elements to support them”.

'The Pantanal is national heritage': protecting the world's largest wetlands

This article is more than 7 years old

Spanning Brazil, Paraguay and Bolivia and home to 4,700 species, the Pantanal wetlands are under threat from deforestation and agriculture. But local people are taking on the challenge to protect this unique region

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By Sam Cowie in Cáceres

Sat 12 Nov 2016 08.00 GMT
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Inside a small aircraft, decorated with a polka-dot jaguar design, Ângelo Rabelo checks data on a small laptop computer. “We’re approaching a river spring!” he shouts over the plane’s noisy engine.

Below, the Paraguay river in Brazil’s Mato Grosso state snakes between clusters of vibrant green forest and extensive patches of farmland. The plane flies over a large, barren-looking stretch of light brown land where soy is being grown. A small buffer zone of trees separates the crops from the river, in which lies a pulsating spring.

Rabelo is the head of local NGO Instituto Homem Pantaneiro, which works to conserve the Pantanal region by monitoring waterways and promoting sustainable practices with the local population. The Paraguay river “is like the main artery feeding the veins of the Pantanal’s body – if this artery gets blocked, the whole body breaks down”, he says.

The Pantanal is the world’s largest wetland territory. Located mostly in Brazil but also covering Bolivia and Paraguay, the wetlands cover an area of 170,500 sq km – equivalent to the combined size of Belgium, Holland, Portugal and Switzerland. It’s home to 4,700 species of plant and wildlife, including endangered species such as jaguars, giant anteaters, giant armadillos and the hyacinth macaw. Thousands of local people make a living from the land, through small-time farming or fishing.

The Pantanal is home to several endangered species, including the hyacinth macaw. Photograph: Joel Sartore/Getty Images/National Geographic Creative

macaw. Photograph: Joel Sartore/Getty Images/National Geographic Creative

But the Pantanal's waterways – essential to all life in the region - are threatened by deforestation, soil erosion from expanding industrial agriculture, and infrastructure projects.

I am seduced by the natural beauty and the constant renewal process of the waters
Angelo Rabelo

Maintaining this unique region is an uphill struggle that requires a multi-pronged approach, but activists and local and international NGOs are taking on the challenge.

Some are *Pantaneiro* – as the locals are known – by birth, others by vocation. Whether their work involves monitoring and preserving the rivers that sustain the wetlands, keeping tabs on endangered species, or pushing for better protective legislation, they are united by a passion for the Pantanal that is both infectious and inspiring.

"Today, I still feel like the first time I arrived in the Pantanal," says Rabelo, a former forest police colonel. "Seduced by the natural beauty and the constant renewal process of the waters."

Agriculture has made a comeback in the Pantanal, with cattle and soy two of Brazil's biggest exports.

Photograph: Brazil Photos/LightRocket via Getty Images

An influx of 'asphalt farmers'

Mass farming in the region began in the 1960s under Brazil's then military government. Following huge floods in 1974, many farms were brought to the edge of bankruptcy and land value plummeted.

Since then, and as Brazil's economy grew during the 2000s, agriculture has made a comeback in the region, with cattle and soy two of the country's biggest exports. In the past five years especially, the Pantanal has seen an influx of farmers from other parts of Brazil. They are known as "asphalt farmers" as they live in the cities instead of on the farms, unlike the traditional farmers of the region.

This is the frontier region, so chemicals that are banned in Brazil can be smuggled in from Bolivia and Paraguay
Dr Catia Nunes da Cunha

"They come to the Pantanal because of the cheap land prices," says Dr Catia Nunes da Cunha, the coordinator of the Pantanal Ecological Studies Centre at the Federal University of Mato Grosso. "In Sao Paulo and Rio Grande do Sul,

where there is good infrastructure, you can't buy cheap land. They often acquire the land [in the Pantanal] for below market price because the local farmers are struggling to make a living."

The change from local, mainly subsistence, farmers to macro-scale agriculture producers, who have no personal connection with the land and use intensive farming techniques and machinery, is regularly cited by academics and NGOs as one of the main threats facing the Pantanal.

According to WWF Brazil, some 40% of the total area of the upper Paraguay river basin in Brazil has already been deforested, and 30% of springs that feed the Pantanal are at ecological risk and require urgent action.

The wetlands cover an area of 170,500 sq km – equivalent to the combined size of Belgium, Holland, Portugal and Switzerland. Photograph: Alamy Stock Photo

Analysts point to rising soy production in the region as an especially worrying trend due to the use of agrichemicals that can run into the waters.

"We don't know where these chemicals are coming from or what's in them. This is the frontier region, so chemicals that are banned in Brazil can be smuggled in from Bolivia and Paraguay," says da Cunha.

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Further complicating the situation is a severe lack of resources available to local police. In the Pantanal city of Cáceres, Captain Thiago Martins de Souza of the local environmental military police says his battalion has just 25 officers to cover 22 municipalities, and only one working 4x4 truck.

Instituto Homem Pantaneiro runs a project called Cabeceiras do Pantanal, which monitors nearly 1,000 water springs and areas of farmland near river banks via monthly plane excursions.

Results are sent to the research department of the local federal university for analysis and if there are any infractions, such as a farm encroaching too close to the banks of the river which can cause soil erosion and interfere with its flow, the environmental police are alerted and the property owner can face a hefty fine.

‘The Paraguay river is like a snake ... and they intend to make the waterway in a straight line. Can you imagine the kind of impact that this would have?’

Photograph: Alamy Stock Photo

Infrastructure interrupting the environment

Beyond agriculture, the increasing use of hydroelectric dams to create energy in the region is also a major threat.

“If you put a series of dams together on one river, you are going to cause interruption to the environment,” says Júlio César Sampaio da Silva, the Cerrado Pantanal programme coordinator at WWF Brazil. In 2012, the organisation launched the Pantanal Pact, a project to protect the Pantanal’s waterways across 25 municipalities, 70 institutions, the public and private sectors, and civil society. The overuse of dams alters the Pantanal’s annual flood and drought patterns, he explains.

There are around 50 dams in the upper Paraguay basin, with another 80 planned. According to Pierre Girard, a professor at the Centre for Pantanal Research, 70% of the hydroelectric energy potential in the region has already been used, leaving just 30%, which will not bring significant benefits. “But it’s a profitable business, given the high cost of energy in Brazil,” he says.

A waterway connecting Brazil, Argentina, Bolivia and Uruguay to transport agricultural products to the ocean is also planned, but a construction date is still to be set.

“The Paraguay river is like a snake; it’s very curvy and they intend to make the waterway in a straight line. Can you imagine the kind of impact that this would have? This is a big problem,” says da Silva, referring to damage of the local ecosystem that would be caused if the river banks were altered artificially.

One million tourists pass through the Pantanal each year

Photograph: Alamy Stock Photo

One million visitors a year

Flying from the Pantanal’s highlands – the *Planalto* – where the farms and dams are located, to the lowlands – the *Planicie* – soaring over vibrant green forests and shiny silver lakes , it’s easy to see why one million tourists pass through the Pantanal each year.

Ecotourism is a growing industry, upheld as a way to preserve the region and supplement the locals’ incomes.

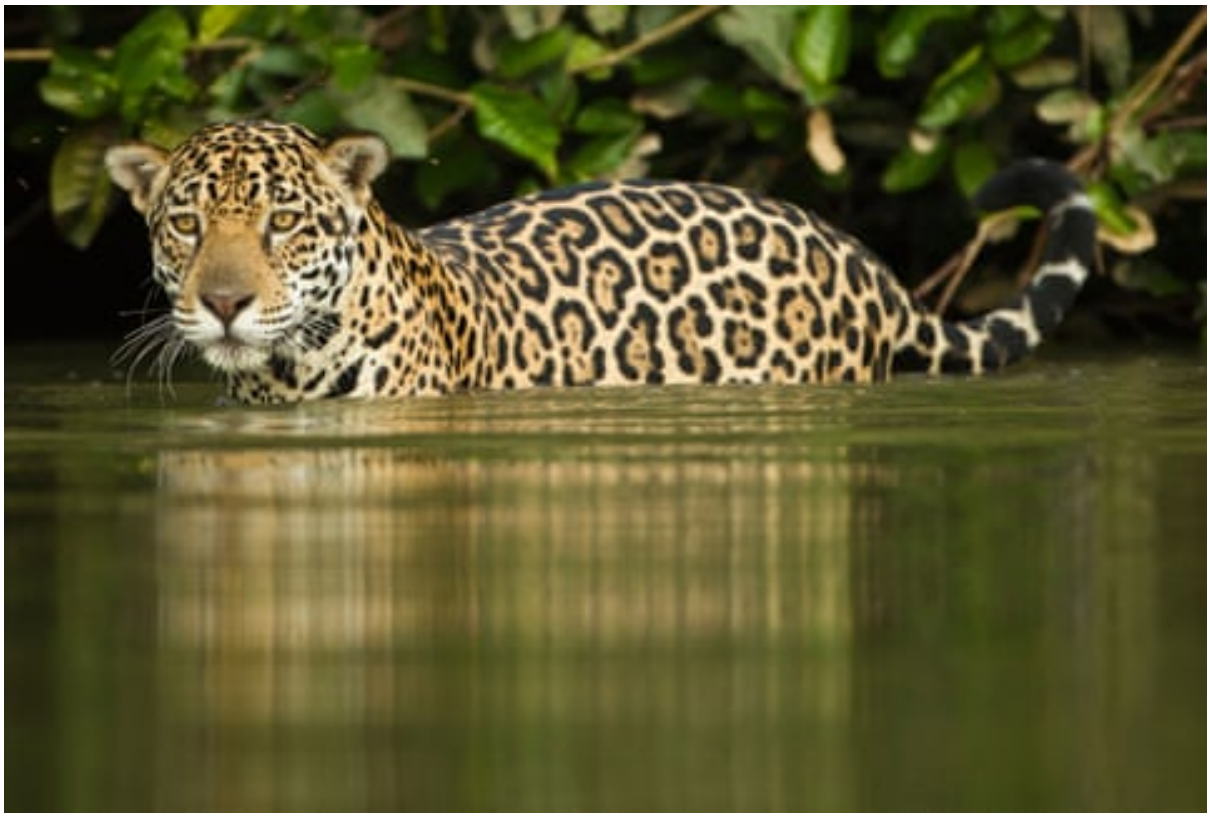
At the Pousada Amolar guesthouse, a Unesco heritage site in the Pantanal conservation area of Serra do Amolar, vet Diego Viana works with Instituto Homem Pantaneiro to collect data from 30 cameras set up to monitor jaguars.

The more they degrade the environment, the more likely that a jaguar will attack their cattle.
Diego Viana

Part of Viana's work involves visiting communities across the Pantanal and advising them not to kill jaguars, for which *Pantaneiros* can earn a great deal of money from rich cattle farmers. Viana says that an *onceiro* – a jaguar killer – can earn up to BR$1,000 (£250) from a wealthy farmer, the equivalent of a month's wages. Killing jaguars in illegal in Brazil, but the perpetrator has to be caught red-handed.

Viana says that while farmers lose cattle to jaguars, therefore reducing profits, killing them is a short-sighted solution. "The jaguar is at the top of the food chain. Kill the jaguar and you will have more deer, more capybara – animals that transmit diseases to cattle," he says.

Farmers cutting down trees to make more space is also an issue, adds Viana. "The more they degrade the environment, the more likely that a jaguar will attack their cattle."



Pantaneiros can earn up to BR$1,000 (£250) from a jaguar kill, the equivalent of a month's wages. Photograph: Alamy Stock Photo

Pushing for a new law

Brazil's forest code provides no specific protocol for the Pantanal. A recent, controversial change to the code in 2013 – brought in under pressure by the powerful agribusiness lobby – has reduced the buffer zone necessary between farmland and river springs, a potentially disastrous measure for the Pantanal. As such, activist groups have been pushing for a Pantanal-specific law.

"The constitution says that the Pantanal is national heritage and therefore a specific law should be created for it. We are trying to push for this at the moment," says Girard.

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The law would encompass all of the Pantanal and the *Planalto* highlands, and override the forest code. The original version of the law was submitted to the senate in 2011 by Blairo Maggi, the controversial former governor of Mato Grosso state and the current Brazilian minister of agriculture. He is popularly known as the *Soybean King*, in reference to the fact that between the 1990s and early 2000s, he was one of the world's biggest producers of the commodity.

Since then, activist groups have been lobbying for the pending legislation to include better protection of the Pantanal and its people.

“It’s a law about restriction of use – things you can and can’t do, using the concept of micro habitats. For example: ‘In this place you can do this, but in this place you can’t do that’,” says Girard. “You have to have rule of law.”