

JAGUARS & WOLVES OF BRAZIL'S GRASSLANDS

CAN WILDLIFE CORRIDORS HELP THESE CARNIVORES?



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AN OCEAN OF GRASS

Central Brazil once contained one of the world's largest grasslands, an ocean of grass comparable to the savannas of Africa. Brazilians call it the "Cerrado" and have cherished for a variety of reasons—some of them for its deep, rich soil on which they have grown thousands of hectares of corn and soy, some for cattle ranching, others for the richness of its increasingly threatened animal and plant life.

The Cerrado is one of three great Brazilian **biomes**. In the north is the world-famous rain forest of Amazonia, while west of the Cerrado the rivers of the Brazilian highlands run out on the vast wetlands known as the Pantanal.

The climate of the Cerrado is extreme. During the six months of the wet season from October to March there is a meter and a half of rainfall. For comparison, an average of only about one meter of rain falls in an entire year on rather damp cities like Seattle and Boston. From April to October, the Cerrado is almost totally dry. During these rainless months temperatures may swing from 40°C during the day to slightly below freezing at night.

Today only 20 percent of the old Cerrado survives, but, sadly, fewer than 20 percent of its remarkable animals and plants

remain. Fragmentation of the area by farms and cattle ranches has left small patches of habitat, sometimes connected, and sometimes isolated. Many animals need larger patches of habitat than what is left to find adequate food and shelter, especially the large carnivores and their prey.

The bright spot in this sadly familiar picture is Emas National Park. At 132,000 hectares, Emas is one of the largest savannah reserves in the world and the only park to protect resident populations of grassland jaguars, pumas, maned wolves, bush dogs, hoary foxes, and crab-eating foxes. It is also home to thousands of rheas (ostrich-like birds known locally as emas), scarlet macaws, pampas deer, giant anteaters, giant armadillos, tapirs, and vast herds of white-lipped peccaries.

Emas National Park has been designated a biodiversity hotspot and named a **World Heritage Site** and biosphere reserve by UNESCO. To help preserve the ecosystem of the Cerrado and also that of the Pantanal wetlands, the Brazilian branch of Conservation International (CI) and Earthwatch Institute, both international non-profit organizations, have initiated an ambitious plan to keep these two biomes connected through a Cerrado-Pantanal corridor. A wildlife corridor is a narrower strip



PECCARIES

Although peccaries and pigs resemble each other, their classification and distribution are different. Peccaries belong to the family Tayassuidae (3 species) and are native to the Americas, while pigs belong to the family Suidae (16 species) and are native to Europe and Africa. Peccaries are primarily fruit-eaters, and are a favorite item on the menu of the Cerrado's large carnivores. Peccaries, like the carnivores, require a large area to survive. They are doing quite well in the Cerrado and Pantanal, though in other areas where fragmentation is more severe, they struggle for survival.



of land that connects fragments of natural forest and larger protected areas through which species populations can move and expand. Wildlife corridors can help reduce the impact of habitat fragmentation by providing links between patches of habitat. With connections between the habitats, animals that have large home ranges or that need to migrate are able to find what they need. The Cerrado-Pantanal corridor covers more than 580 kilometers. Scientists from CI and Earthwatch are working at both ends to create this corridor and keep it safe. Their success will maintain what was once a lively genetic interchange among some of the most rare and threatened animals on Earth.

THE CARNIVORES

The largest cats of the western hemisphere, jaguars live in the rain forests of Central and South America and in the wetlands of the Pantanal. But there is also a grasslands jaguar that hunts like the African leopard it somewhat resembles—slipping through the tall grass, carrying off its prey to patches of thorny scrub. Low-slung, heavy, powerful, with the strongest jaws of all the felidae, it often pierces the skull of its prey with one bite and finds the hard shell of the armadillo no challenge. The beautiful tawny coat with its unique pattern of black rosettes has, of course, been part of the jaguar's undoing, and even though it is now illegal to kill one of these great cats, they are still hunted and their skins sold on the black market.

The puma is another predatory cat that lives in Brazil's grasslands. Also known as a cougar, panther, or mountain lion, the puma is one of the most successful of the large cats, living from the southwest of Canada all the way down to the tip of South America. Male pumas may have home ranges as large as 240 square kilometers, while females tend to have smaller ranges. A puma is large enough to bring down a deer or cow, but often eats rodents, rabbits, hares, or beavers, too. Their biggest threats are habitat loss, road kills, and the hostility of private landowners.

The maned wolf is not a wolf at all. It belongs with wolves, dogs, and foxes to the family canidae, but is the only member of its genus, the *Chrysocyon*. This beautiful animal has been described as "a fox on stilts," and some have speculated that its

tremendously long legs evolved for life in a world of tall grass. In fact, it does look like a fox with its red-gold coat, bushy tail, and sharp, foxy face, but it stands almost a meter tall and has been known to take prey as large as a lamb. The maned wolf is primarily a predator, eating a wide selection of small grasslands animals. It also eats a yellow fruit called the lobeira that is poisonous when unripe. This fruit makes up nearly a third of its diet. The maned wolf is solitary and monogamous. It is classified as "vulnerable" on the IUCN Red List of Endangered Species, the world's most comprehensive inventory of the global conservation status of plants and animals. The designation "vulnerable" means that the species has a 10 percent chance of extinction in the next 100 years, but scientists think that the maned wolf's situation may be more serious than that.

Crab-eating foxes are small, weighing in at about 6-7 kilograms. Primarily nocturnal, they eat crabs, as their name suggests, but they also eat small rodents, lizards, frogs, insects, eggs, and some fruits. Occasionally hunted for their pelts, these foxes are not considered to be threatened in the wild.

RESEARCH IN THE CERRADO

Dr. Leandro Silveira and Dr. Anah Jácomo are the scientists leading the research effort for the Cerrado end of the project. They have been studying the mammals of Emas National Park for 11 years. The park protects 55 mammal species, 16 of which are officially considered endangered, as well as 370 species of birds and 60 of reptiles. Because carnivores play key roles in any ecosystem, the researchers are concentrating on four carnivore species with distinct ecological needs, the jaguar, the puma, the maned wolf, and the crab-eating fox. The researchers are also keeping track of larger prey animals, such as the tapir and white-lipped peccary.

Silveira and Jácomo are studying these animals inside and outside the Park, particularly in the fragmented landscape of the surrounding farmland where the carnivores prey upon livestock and where herds of 100 peccaries may lay waste to a field of crops. While the destruction caused by the peccaries is clearly documented, the livestock losses blamed on jaguars may or may not be justified. Up until recently,

ranchers were likely to try to shoot jaguars on sight to protect their livestock. Today, however, CI will reimburse any farmer who believes he has lost an animal to the big cat. In others cases, people might debate the sizes of the tooth marks on the animal, but CI feels that relationships with landowners are very important, and would rather err on the side of caution. In any event, it is as vital to know how an animal lives on land occupied by people and livestock as it is to know how it lives in its wild habitat.

THE RESEARCH GOALS

Silveira has provided a concise list of objectives for the work that he and Jácomo will undertake during the 2005 April–November season of the Cerrado study. They will be assisted by three other experienced researchers, by college student volunteers and, over the course of the season, by eight teams of volunteers from Earthwatch. This is what they expect to do:

1. Investigate home range size, habitat use, and movement patterns of the designated species in the Park and surrounding farmland
2. For some species investigate behavior such as parental care, territoriality, and sociability between mates
3. Study the diets of the carnivores
4. Investigate prey abundance
5. Assess carnivore road kill on the two roads that border the park
6. Assess the state of the carnivores' health in the region.



GATHERING DATA ON LARGE CARNIVORES

To find out about the home range sizes, habitat use, and movements of carnivores, they will put radio collars on the animals. This, of course, requires catching and sedating the animals, which they do by using live traps. The animals enter the traps lured by live chickens. Once sedated, the researchers put radio collars around their necks, and release them when their sedatives are wearing off. To date, 68 carnivores of nearly a dozen species in the Cerrado have been radio-collared!

Daily, researchers check the 45 baited traps. They also spend hours each day perched on top of tracking towers. Radio collars send off signals much like a radio station does. Each collar gives off a signal of a different frequency. With a receiver tuned to a specific animal's frequency, researchers receive beeps when it is in range and document the location of each animal at regular intervals over time. Researchers are also radio-collaring and tracking animals in the surrounding farmlands.

When the data gathered from monitoring the radio-collared animals is put together, scientists will be able to tell a little bit more about these animals' social lives, such as where their territories are and when they defend them, how they care for their young, and when they socialize with mates. Visual sightings of these animals will help answer some questions about where the animals' pups or cubs are, who their mates are, and so on. The maned

wolves in Emas National Park are so tolerant of people that their behavior can be studied directly from the back of a truck.

To find out about their diets, researchers collect their feces or "scat" as wildlife biologists call it. This is a simple matter for some species like the maned wolf and the crab-eating fox, which defecate in specific, ritualized places, but more difficult for those that must be followed, like the cats, and caught in the act. The washed and dried scats will be sent away for laboratory analysis. Direct



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WORLD HERITAGE SITES

The United Nations Educational, Scientific and Cultural Organization (UNESCO) defines heritage as our legacy from the past, what we live with today, and what we pass on to future generations. Throughout the world there are special places that are important sites of cultural and natural heritage, irreplaceable sources of biodiversity and inspiration. Some of these sites include Australia's Great Barrier Reef, Brazil's central Amazon, and China's Great Wall.

Through international agreement, these World Heritage sites belong to all the people of the world, and must be protected for future generations.

UNESCO encourages the identification, protection and preservation of cultural and natural heritage around the world considered to be of outstanding value to humanity. The international treaty in which this agreement is written is called the Convention concerning the Protection of the World Cultural and Natural Heritage, and was adopted by UNESCO in 1972.

Today, there are 788 sites listed on the World Heritage List, with 611 cultural, 154 natural, and 23 mixed properties in 134 countries.

For more information, visit: <http://whc.unesco.org>

observation of the animals foraging will round out the information from the lab.

To gather data on prey abundance, researchers will check heat sensitive camera traps on game trails throughout the Park. Camera traps are non-invasive ways of gathering data, as the animals are only "trapped" digitally – when they walk by the heat sensitive cameras, the camera snaps a photo, and the scientists can then see all the animals that passed an area. These data, combined with the dietary information from fecal analysis, will give a detailed picture of what prey are preferred by the carnivores and how many of the preferred species are available.

To assess the road kill on the two major roads bordering Emas National Park, researchers will monitor the roads while radio-tracking animals and checking traps. If they see a road kill, they will record a GPS position for it, measure the animal, collect its stomach contents for dietary analysis, and remove its organs and parasites for **epidemiology** studies in the laboratory.

To further assess the health of the carnivore population, researchers take blood samples from the animals trapped for radio collaring. The samples will go to a lab for analysis.

THE BIG PICTURE

The Cerrado carnivore studies involve an enormous amount of patience and work. But gathering data on the animals is just part of the picture. The researchers need to understand the local people as well as the animals and have to find ways to involve the people in the goals of the project. Already the farmers and ranchers near the study site are proud of Emas National Park. The interest of international conservation groups and, perhaps even more, of National Geographic and the BBC, have impressed the local people and smoothed the way for the messages of Silveira and Jácomo. These farmers have a living to make from the land. They have seen that the researchers understand their problems, and they are beginning to believe that it is possible to coexist with the carnivores (and even the peccaries) without killing every one that comes within rifle range.

The creation of the Cerrado-Pantanal Corridor requires a vast body of information about the living things in both ecosystems. What animals live in the Cerrado and the Pantanal? What are their needs and interrelationships? Which ones have interbred in the past or are likely to do so in the future? Is it likely that the animals will use the Corridor? Which ones? How many?

GLOSSARY

biomes – an area on the Earth's surface that has a certain set of characteristics. There are seven kinds of biomes in the world: tundra, taiga, temperate forest, tropical rainforest, desert, grassland, and ocean.

canidae – the dog family.

epidemiology – the branch of medicine that deals with the causes, distribution and control of disease in populations.

felidae – the cat family.

fragmentation – the breaking up of spaces that are home to animals into smaller and unconnected segments.

genus – in taxonomy the division of living things below the level of family and above that of species.

Is the corridor successfully connecting the two habitats? The scientists are getting answers to these questions, and from these answers a dream is beginning to emerge—580 kilometers of safe passage for animals between two of the richest biomes on Earth.

FIND OUT MORE

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Key Words

Jaguar, maned wolf, crab-eating fox, puma, Brazil, Pantanal, Cerrado, wildlife corridor, habitat fragmentation

Volunteers have joined this project through Earthwatch Institute. Read more about this study and other scientific field research at www.earthwatch.org.



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